Wolters Kluwer

Fair Lending Wiz®
Training Manual

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Welcome to Fair Lending *Wiz* Training

Congratulations on selecting Fair Lending *Wiz*! All of us at Wolters Kluwer would like to welcome you as a new user, and we are looking forward to working with you to help you achieve all your fair lending analysis goals.

Compliance faces constant regulatory scrutiny, intense examinations, and increasing analysis demands. It can be difficult to keep pace with the changing environment. Fair Lending *Wiz* positions your institution to meet these demands, your business goals, and regulatory requirements.

Wolters Kluwer recognizes that clients also need dedicated support to help reach and often exceed their business goals. The following support is available to all our valued customers:

Account Management: Your Wolters Kluwer Account Representative is your primary point of contact and champion. He or she will be working closely with you to ensure that all of us at Wolters Kluwer do everything within our power to help you succeed.

Implementation: Our teams of implementation specialists ensure that the installation and configuration of Fair Lending *Wiz* is successful, and that you are able to import, process and analyze your various loan product categories.

Documentation: In addition to release notes and installation instructions, Fair Lending *Wiz* comes with direct access to the *Wiz* Web Center that provides a definitive set of user documentation for your reference. Context sensitive on-line help is also available. To access, select the F1 key from any screen in the *Wiz*.

Technical Support: Wolters Kluwer Technical Support is committed to providing dependable and timely resolutions of all customer inquiries regarding *Wiz* software products. Wolters Kluwer technical support is available for free to clients via telephone, Internet, or email throughout the United States. Every client inquiry is professionally tracked from the time contact is initiated until a jointly agreed resolution is reached. Based on the priority of a case, Wolters Kluwer technical support escalates client issues through our organization to ensure mission critical problems receive a quick resolution.

In addition to promptly responding to client-initiated requests, Wolters Kluwer technical support proactively reports vital information about the availability of new product releases and current release patches to our client base.

Key Technical Support Information:
Hours of Operation: Monday - Friday, 8:00 am - 8:00 pm Eastern, excluding major holidays.

Contact Methods:
Technical Support- 1-800-261-3111, option 1, option 2
fairlendingwizsupport@wolterskluwer.com
Website www.wolterskluwerfs.com

Chapter 1- Navigation

To maximize the potential of Fair Lending *Wiz*, it is important to understand how to navigate within the software. The product functionality within *Wiz* can be separated into five major sections:

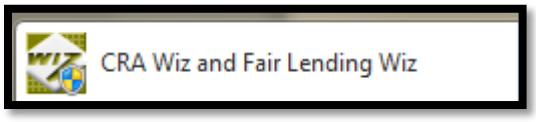
- ✓ Data Importing
- ✓ Data Editing and Preparation for Fair Lending Analysis
- ✓ Marketing and Demographic Information
- ✓ Fair Lending Analysis
- ✓ Mapping for Fair Lending Purposes

This chapter describes how to navigate within Fair Lending *Wiz* and identify product functionality.

Accessing CRA and Fair Lending *Wiz*

To launch the CRA *Wiz* program, follow these steps:

1. Select CRA *Wiz* from the Windows Start Menu.



2. Enter the following information:
   a. SQL Server Machine Name
   b. CRA *Wiz* User Name
   c. CRA *Wiz* Password

SQL Server Machine Name - by default, CRA *Wiz* will display (local) in this field indicating that the SQL-server is running on this machine. If your institution uses a dedicated SQL Server in a client/server environment, then the user will want to place the name of the SQL server machine in this field.

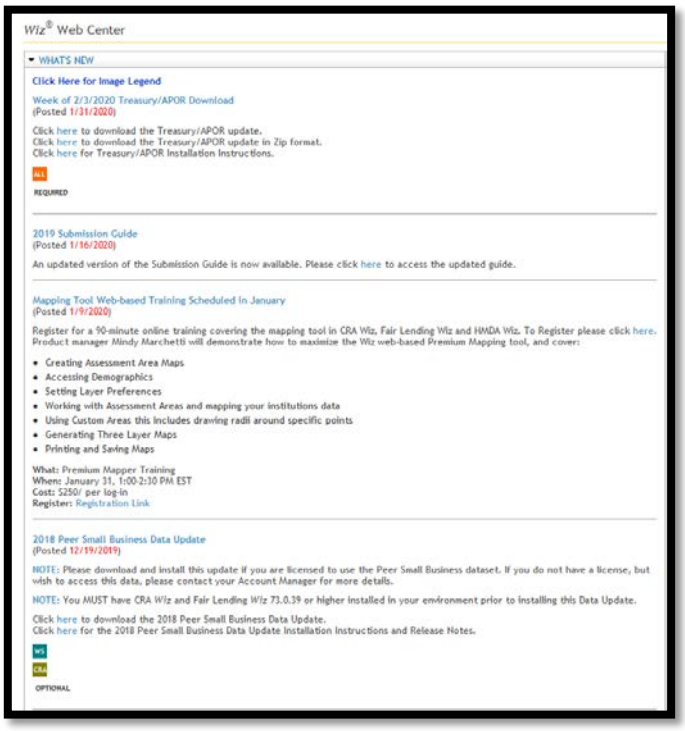
User Name - by default, CRA *Wiz* will display Admin as the default user. If the CRA *Wiz* administrator has created a user name for you, then you will replace Admin with your user name.

Password - the first time that the user logs into CRA *Wiz*, the password field will be blank, and the user will be prompted to create a password. If the Remember Password option is selected, then each time the user logs into CRA *Wiz*, the user name and password will be populated by default.

Working with the *Wiz* Web Center

Overview - The *Wiz* Web Center is a dynamic Web page that provides links to software updates, industry information, treasury rate downloads and documentation links.

Wolters Kluwer will periodically use the Web Center to post important information from various sources. While this information may not be compliance related, it may be vital to your institution.

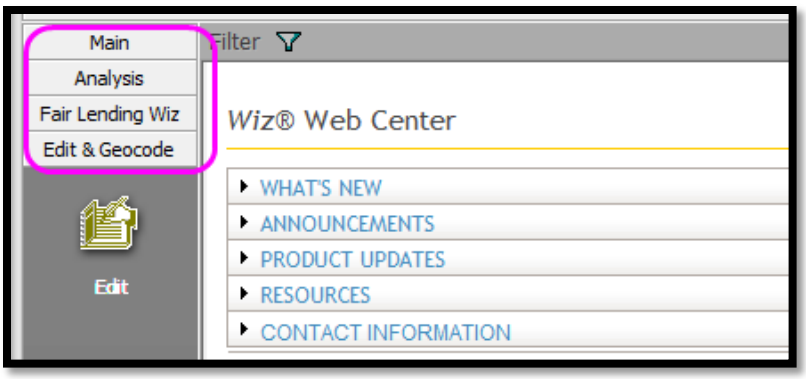


Best Practice - Register your email address to receive advance notice of updates found under the Announcements tab on the *Wiz* Web Center.

Component Navigation

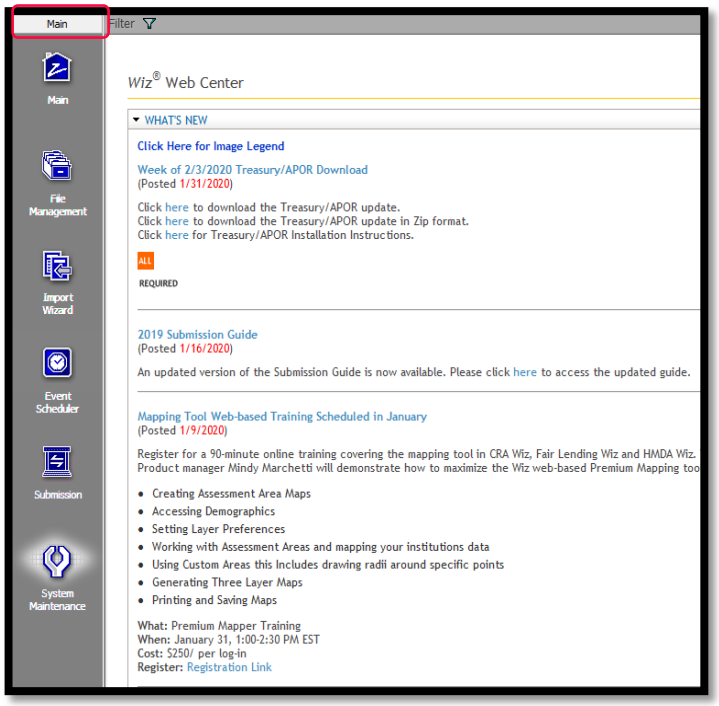
The software categorizes the product functionality into four tabs:

- Main
- Analysis
- Fair Lending *Wiz*
- Edit & Geocode



The Main Tab

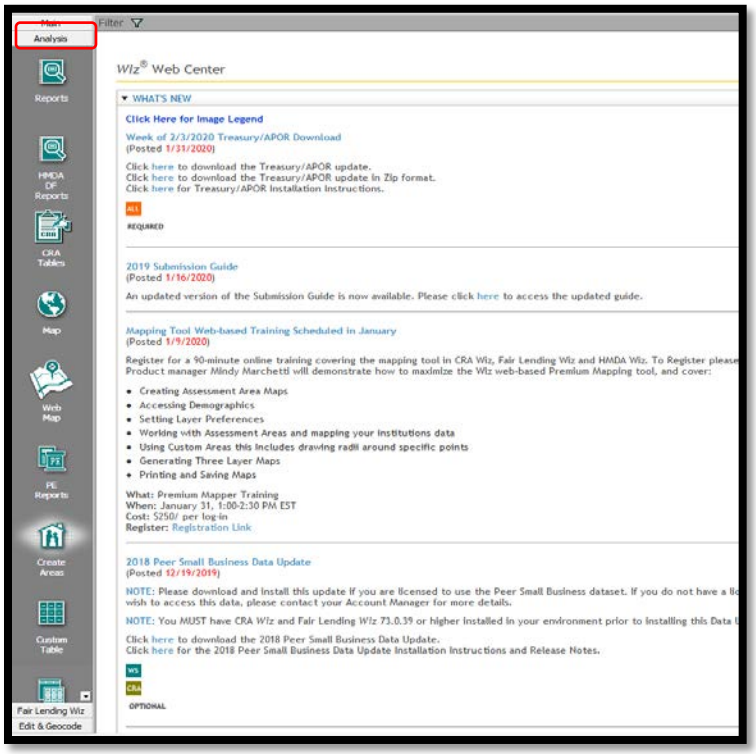
The Main tab in CRA *Wiz* contains the following product functionality:



- **Main** - this icon gives users access to the *Wiz* Web Center for industry information and software updates
- **File Management** - this icon gives users access to the files that have been imported into CRA *Wiz*. In this area, users can copy, delete, transfer, install, and rename files in addition to other file management features
- **Import Wizard** - this icon gives users access to the Import Wizard that is used to import data files such as; mortgage, small business, consumer, or other into CRA *Wiz*
- **Event Scheduler** - this icon gives users access to the event scheduler allowing them to set up an automated schedule for importing data, geocoding data, generating reports and exporting data
- **Submission** - this icon gives users access to the Submission Wizard providing them with the ability to submit HMDA or CRA data to Regulatory Agencies
- **System Maintenance** - this icon gives users a view of where the software has been installed, as well as the licensing level for each user

The Analysis Tab

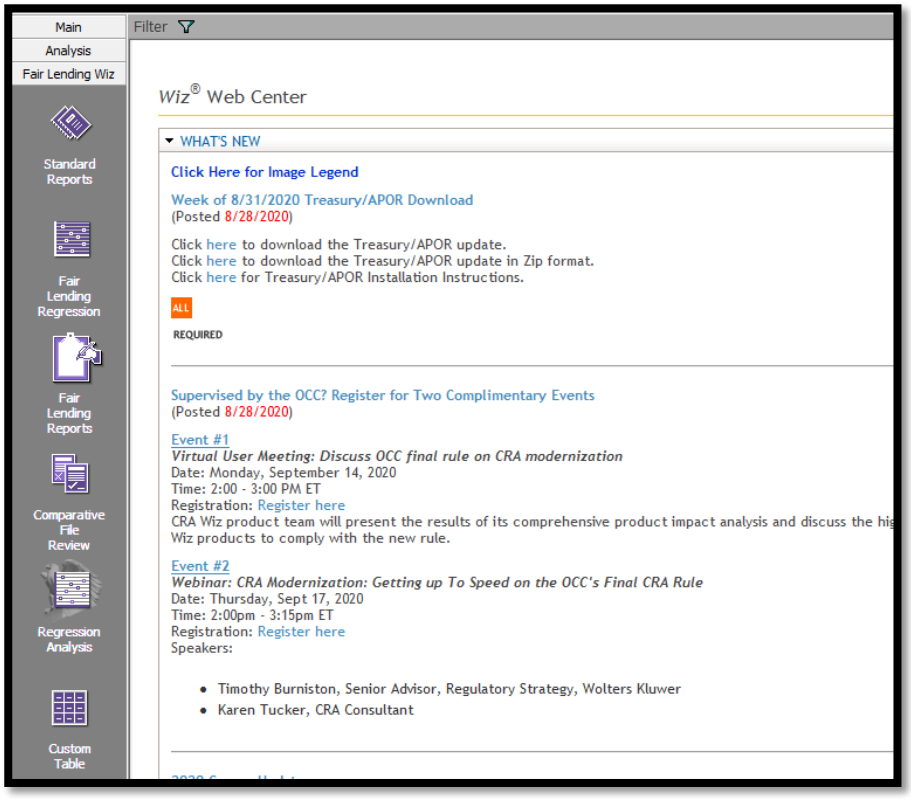
The Analysis tab contains the following product functionality:



- **Reports** - provides access to standard reports contained in CRA *Wiz*. The reports displayed will vary depending on the type of data file set as active
- **CRA Tables** – provides access to CRA analysis reports and tables for periods from 3 months up to 5 years
- **PE Reports** - provides access to the Performance Evaluation (PE) Reports Wizard, providing institutions with critical information needed to prepare a written evaluation of its record of meeting the credit needs of its community, including low-and moderate - income neighborhoods and borrowers, consistent with safe and sound operation of the institution
- **Web Map** – Web-based maps used to map lending patterns, branches, and assessment areas
- **Map** - provides access to the mapping functionality within CRA *Wiz*, allowing users to map lending patterns, branches and assessment areas of their institution
- **Create Areas** - provides access to the assessment area functionality. Within this functionality, users can create, save, and view demographics of assessment area(s), states, counties, MSAs or Census Tracts
- **Custom Tables** - provides the ability to create and save custom reports and conduct detailed analysis on a file
- **Workbook Builder** - provides the ability to take multiple custom tables created in *CRA Wiz* and transfer the reports to individual worksheets within Microsoft Excel for further analysis
- **Custom Report Wizard** - This icon can be used to create a user specific report using Crystal Reports which can then be added to Standard Reports. For more information on the Custom Report Wizard, contact your Wolters Kluwer Account Representative

The Fair Lending *Wiz* Tab

The Fair Lending *Wiz* tab contains the following product functionality:



Fair Lending Regression – this icon is the newest release of SaaS based regression. This icon will launch the regression tool in a separate window, which allows users to test for disparate impact in underwriting and pricing by comparing each prohibited-basis group against equally-or less-qualified control group applicants

Fair Lending Reports – this icon
contains several important analytical reports, broken into the following sections:

- Fair Lending Analysis Reports
- Standard Summary Reports
- Risk Factor Analysis Reports

Comparative File Review – this icon provides a critical component of fair lending analysis and contains two parts:

- Decisioning Comparisons – compares each prohibited-basis denied applicant against equally- or less-qualified approved control group applicants
- Pricing Comparisons – compares each prohibited-basis approved borrower against equally- or less-qualified control group borrowers

Regression Analysis – this icon is the legacy Fair Lending Wiz regression icon. Fair Lending Regression has an updated module (discussed above) that is powered by SaaS and provides a streamlined approach to regression. The legacy Fair Lending Wiz regression also allows users to conduct disparate impact analysis and contains two parts:

- Decisioning Regression – allows the user to control for underwriting factors when comparing all prohibited-basis applicants against all control group applicants
- Pricing Regression – allows the user to control for pricing factors when comparing all prohibited-basis borrowers against all control group borrowers

Custom Table – this icon opens the custom table builder for ad-hoc queries against any field(s) in the database.

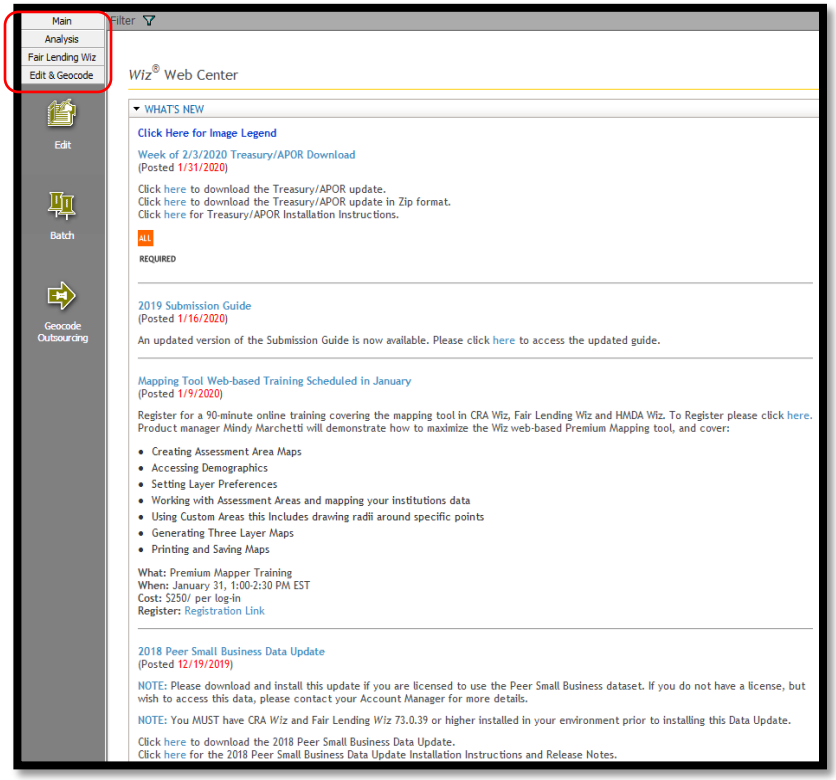
The CRA *Wiz* Edit & Geocode Tab

The Edit & Geocode tab contains the following product functionality:

- **Edit** - this icon gives users the ability to edit the data that has been imported or manually entered into CRA *Wiz*. The user will also have access to exception reports, filtering capabilities, and interactive geocoding

- **Batch** - this icon gives users access to the CRA *Wiz* geocoder. From this screen users will be able to apply geocode settings and geocode the file in a batch process

- **Geocode Outsourcing** – this icon gives users access to the process tool used to send records to Wolters Kluwer for outsourced geocoding

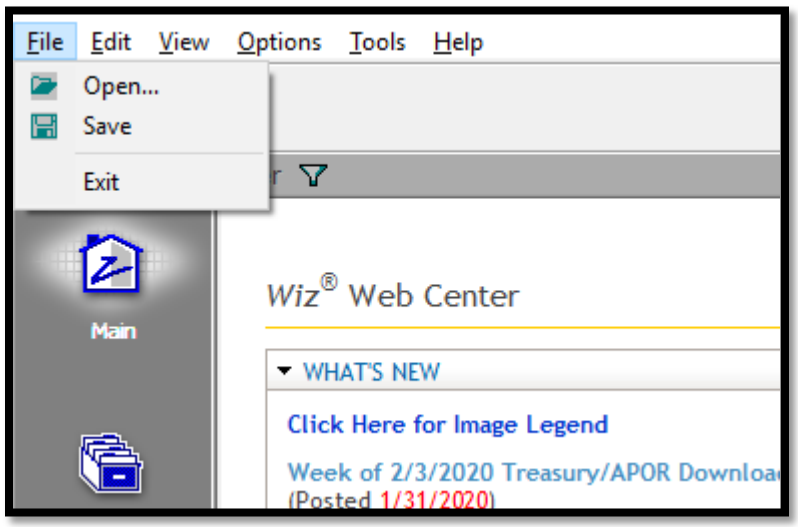


Additional Navigation Tools

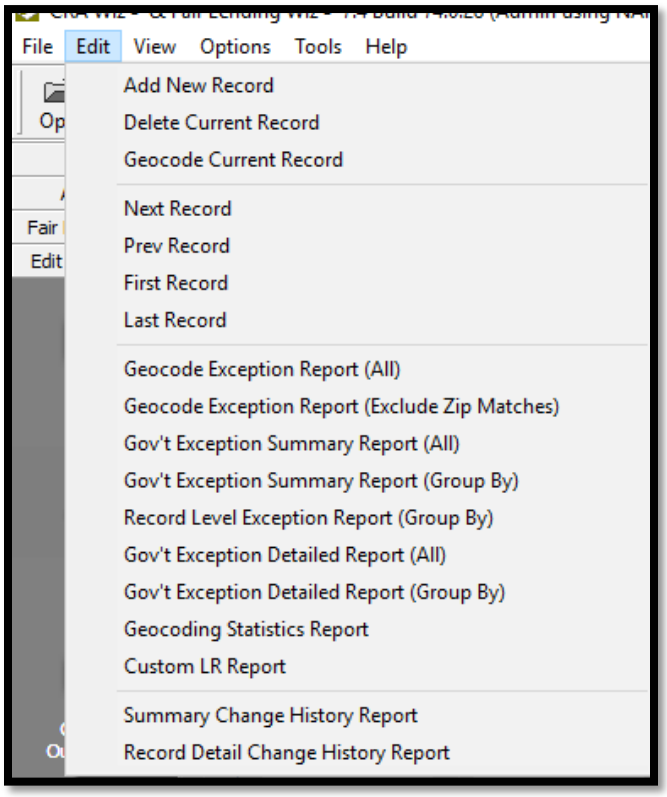
CRA *Wiz* provides additional navigational tools in conjunction with the icons located on the view bar. There are six menu options that users can access to perform a variety of functions within the software. The menu options are context sensitive, but include:

- File
- Edit
- View
- Options
- Tools
- Help

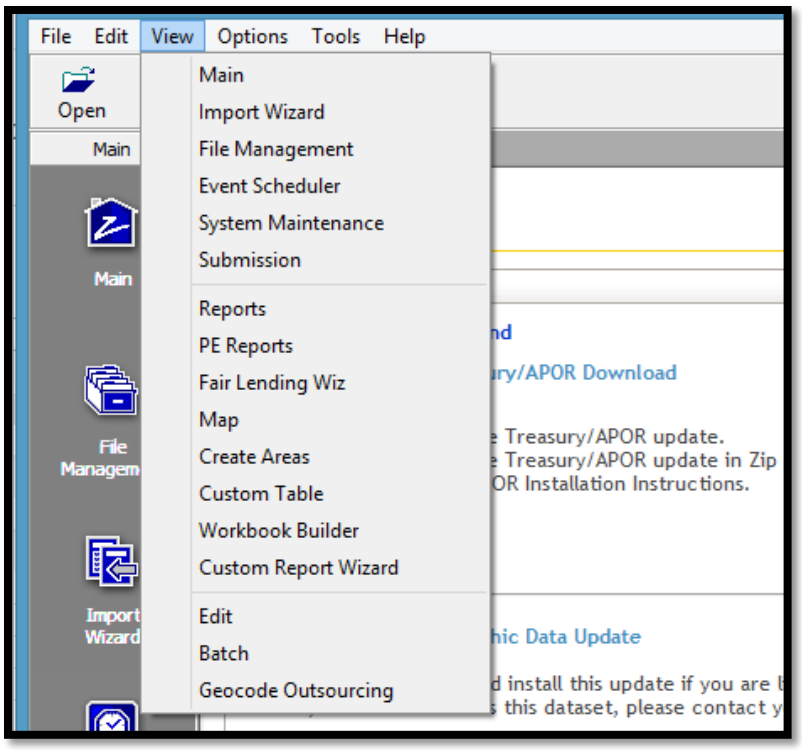
- **File** - The File menu gives users the ability to open files, save files, and exit the program



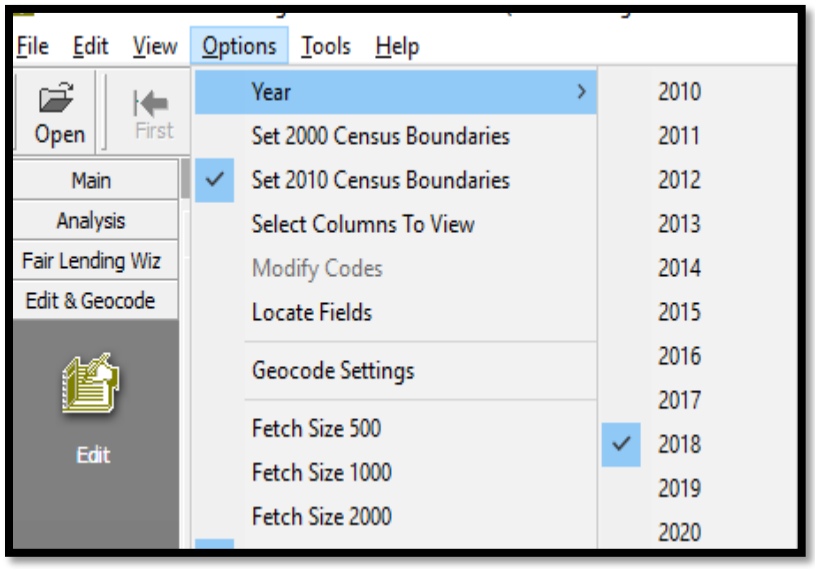
- **Edit** - The Edit menu only appears when using the Editing features



- **View** - The View menu gives users the ability to access most screens and product functionality contained within *Wiz*

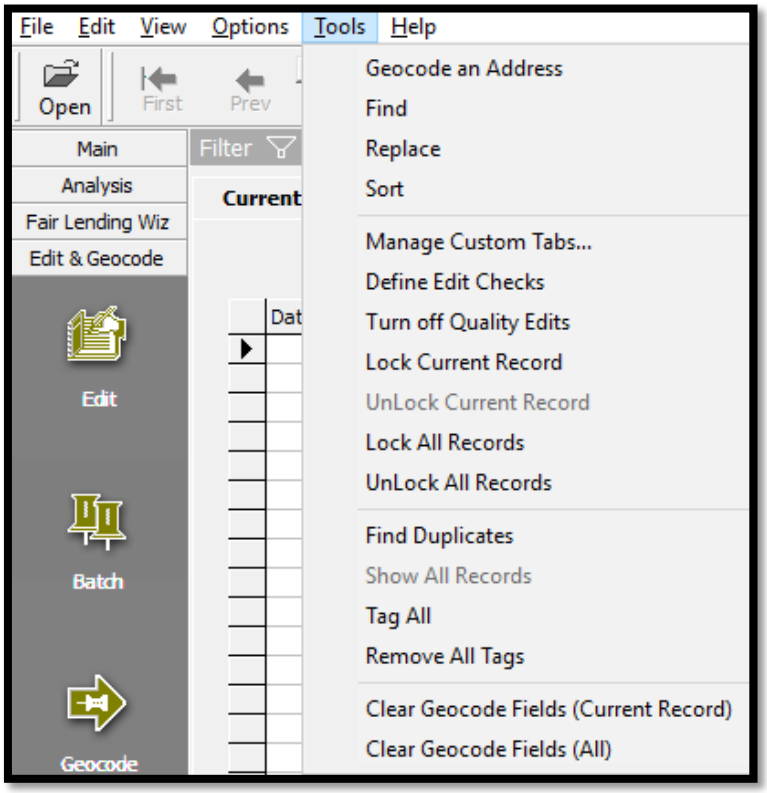


- **Options** – The Options menu gives users the ability to change the year CRA *Wiz* is using to match the activity year of the data file as well as the ability to switch between 1990, 2000 and 2010 Census Boundaries

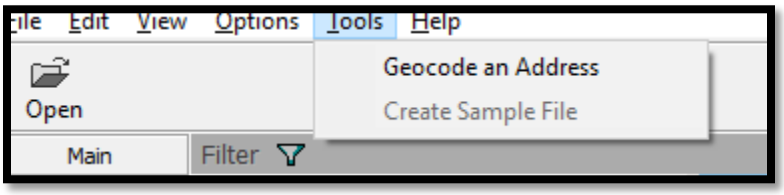


It is important to have the year match the activity year of your file. This will ensure correct calculations are performed when importing new information or recalculating various fields.

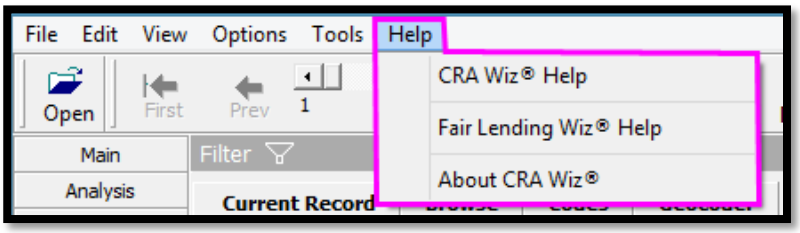
Tools - Except in the Edit screen, the Tools menu gives users access to the "Geocode an Address" function, providing users the ability to geocode or verify geocode values for a single address



In the Edit function, selecting Tools changes the view to what is displayed here.



- **Help** - The Help menu gives users access to online, context-sensitive help as well as information about what version and build of CRA *Wiz* being used



Chapter 2 - System Maintenance

This chapter provides users with information that will assist with maintaining the location of the software, license authorization, user access levels, and the settings of CRA *Wiz*. The following sections are pertinent to Fair Lending:

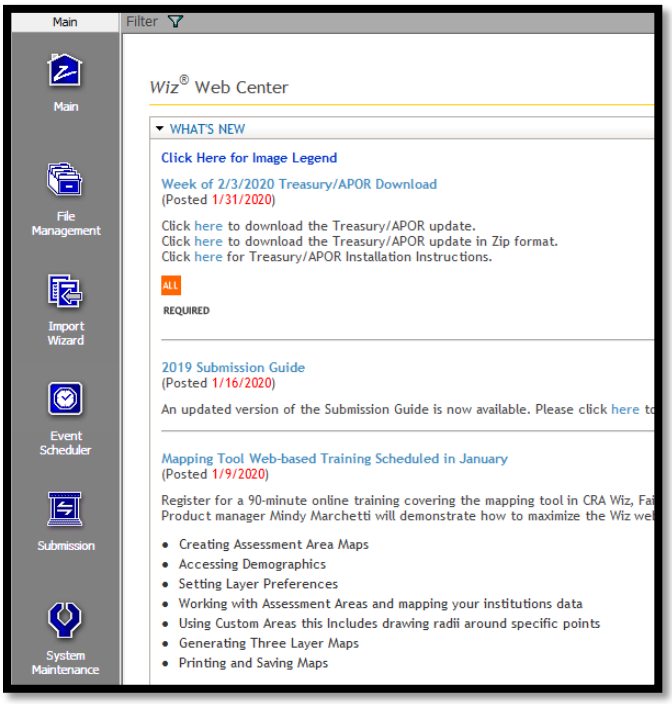
- ✓ **Settings Tab** – Race Proxy, Ethnicity Proxy, BISG Race Proxy
- ✓ **Minority & Comparator Tab** – Default definitions of Protected Class Groups vs Control Groups

Introduction

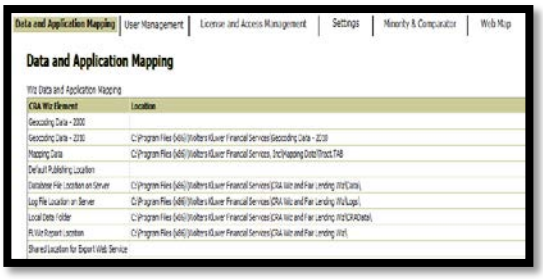
The System Maintenance area provides the administrator of CRA *Wiz* with various options that will help maintain the integrity of the software. It is typically used by IT or network administrators when configuring the server environment, setting up users and managing settings to provide access to outsourcing and/or web services. Training and other information can be found in the CRA *Wiz* Training Manual

The System Maintenance button can be found in the Main tab. To access System Maintenance, follow these steps:

1. From the Main tab, scroll down and Click **System Maintenance**



Within System Maintenance there are six tabs. Each tab provides information based on the level of access a user has within CRA *Wiz*.

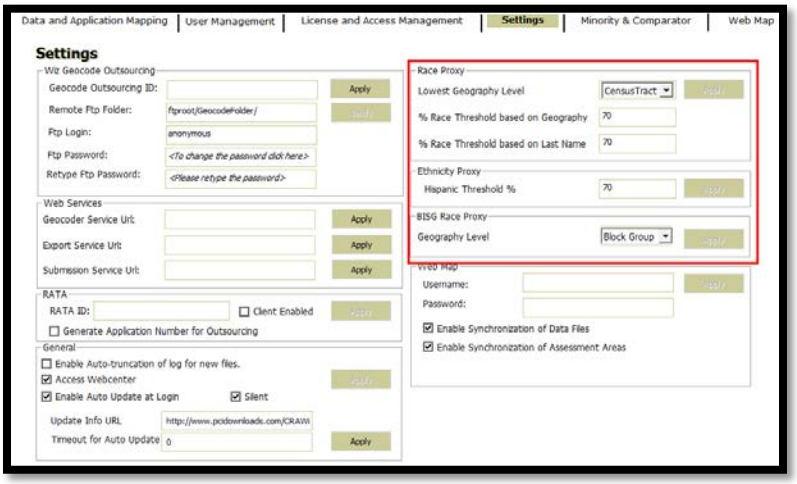


- **Data and Application Mapping** - shows the CRA *Wiz* element and the location
- **User Management** - lists all users and their access level as well as the security mode
- **License and Access Management** - shows the licenses available for each module as well as the access level of each user
- **Settings** - provides settings for geocode outsourcing, proxy, and web settings
- **Minority and Comparator –** provides settings for Minority (Protected) groups and Comparator (Controlled) groups
- **Web Map** - allows users to manage data and saved assessment areas that are synchronized with Web Map

Settings

Race Proxy

Click on settings in System Maintenance to assign proxies to files that do not have Race, Ethnicity or Gender.



- Proxies use either the BISG method OR the Wolters Kluwer Race/Ethnicity methods
- Enter the desired **Threshold** percentage values (if you wish to change it from the default value of 70). If changed, click **Apply**
- From the **Geography Level** drop-down menu, select the desired geography level on which to base geography matches. If changed to something other than "Block", click **Apply**

Best Practices:

- Change the Lowest Geography Level in Race Proxy to Census Tract (all three geography levels are actually reviewed, starting with Block, then Block Group, then Census Tract)
- Leave the thresholds at 70% for Geography, Last Name and Ethnicity Proxy unless you have performed tests in your markets to determine that a different number works better. The higher the percentage, the less likely someone will be classified by last name or geography. The Wolters Kluwer method uses the higher of the two methods (last name OR geography), if both apply
- Use the BISG method if you are covered by CFPB rules. If regulated by an agency other than CFPB – ask your regulator what method to use. The BISG method combines the geography and last name probabilities together to produce probabilities for each race or ethnicity
- DO NOT CHANGE the BISG Race Proxy geography level setting. The program automatically selects Block Group first then moves to Census Tract level if appropriate

Ethnicity Proxy

- The Ethnicity proxy threshold only applies to the Wolters Kluwer alternative method to the BISG. It has no bearing on the BISG method
    - As mentioned above, use either BISG or RACE and ETHNICITY. You cannot combine the two methods
    - The BISG method treats ETHNICITY as a Race Category, classifying an applicant as either American Indian (1), Asian (2), Black/African American (3), Hawaiian (4), White non-Hispanic (5), Hispanic (8) or Other Race (9)
- If you are using the Wolters Kluwer method and wish to change the threshold (not recommended), enter the desired **Threshold** percentage value, click **Apply**

If you are not sure what the appropriate threshold percentages should be set to, Wolters Kluwer recommends leaving the default values.

Race Proxy Examples

Each of these examples is based on the Default Settings (Race – Last Name setting 70%, Race – Geography Level 70%, Ethnicity Last Name setting 70%, BISG at Block Group level).

Example 1: Last Name "NAM", living in State 36, County 47, Census Tract 0560.00, Block Group 2

- Geography Levels
    - White 84.13% (highest level based solely on Geography)
    - Black 1.07%
    - More than 2 Races 1.88%
    - Hispanic 5.93%
    - Other Race 1.00%
    - Asian/Pacific Islander 7.01%
- Last Name "NAM"
    - Probability of being "White" based on last name 3.56%
    - Probability of being "Black" 1.07%
    - Probability of being "American Indian" 0.00%
    - Probability of being "More than 2 Minority Races" 1.88%
    - Probability of being "Hispanic" 0.00%
    - Probability of being "Other Race" 0.00%
    - Probability of being "Asian/Pacific Islander" 92.77% (highest level based solely on Last Name)
- BISG Combined Probabilities
    - Probability of being "White" based on last name 31.43%
    - Probability of being "Black" 0.09%
    - Probability of being "American Indian" 0.00%
    - Probability of being "More than 2 Minority Races" 0.23%
    - Probability of being "Hispanic" 0.00%
    - Probability of being "Other Race" 0.00%
    - Probability of being "Asian/Pacific Islander" 68.25% (highest level combined probability)

- Wolters Kluwer Method (Geography Level – White 84.13% OVER 70%; Last Name Asian/Pacific Islander 92.77% OVER 70%). Final classification Asian Pacific Islander

- BISG Method Asian/Pacific Islander 68.25%

Race Proxy Examples (continued)

Example 2: Last Name "ARJUN", living in State 36, County 93, Census Tract 0216.00, Block Group 2

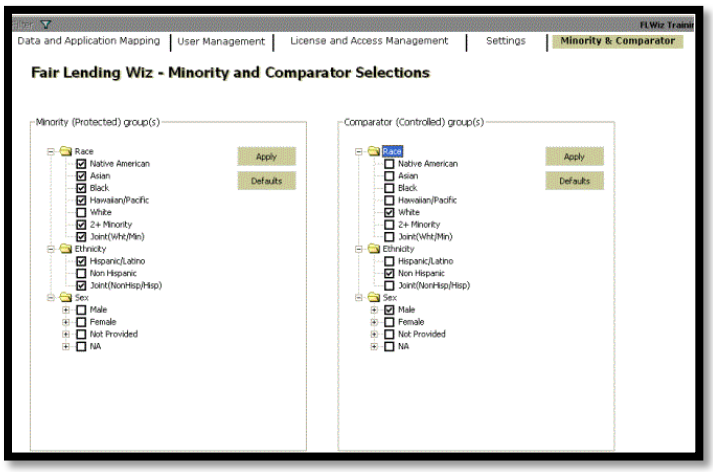
- Geography Levels
  - White 57.49% (highest level based solely on Geography)
  - Black 12.56%
  - American Indian/Alaska Native 0.81%
  - More than 2 Races 7.14%
  - Hispanic 6.34%
  - Other Race 8.18%
  - Asian/Pacific Islander 7.49%
- Last Name "ARJUN"
  - Probability of being "White" based on last name 4.64%
  - Probability of being "Black" 15.89%
  - Probability of being "American Indian" 0.00%
  - Probability of being "More than 2 Minority Races" 45.7% (highest level based solely on Last Name)
  - Probability of being "Hispanic" 0.00%
  - Probability of being "Other Race" 0.00%
  - Probability of being "Asian/Pacific Islander" 31.79%
- BISG Combined Probabilities
  - Probability of being "White" based on last name 25.88%
  - Probability of being "Black" 19.36%
  - Probability of being "American Indian" 0.00%
  - Probability of being "More than 2 Minority Races" 31.67% (highest level combined probability)
  - Probability of being "Hispanic" 0.00%
  - Probability of being "Other Race" 0.00%
  - Probability of being "Asian/Pacific Islander" 23.10%

- Wolters Kluwer Method (Geography Level – White 57.49% NOT over 70%; Last Name "Two or More Minorities" 45.7% NOT over 70%). Final classification – None

- BISG Method "Two or More Minorities" 31.66% (no minimum threshold is applied to the BISG method)

Minority and Comparator Selections for Fair Lending Wiz

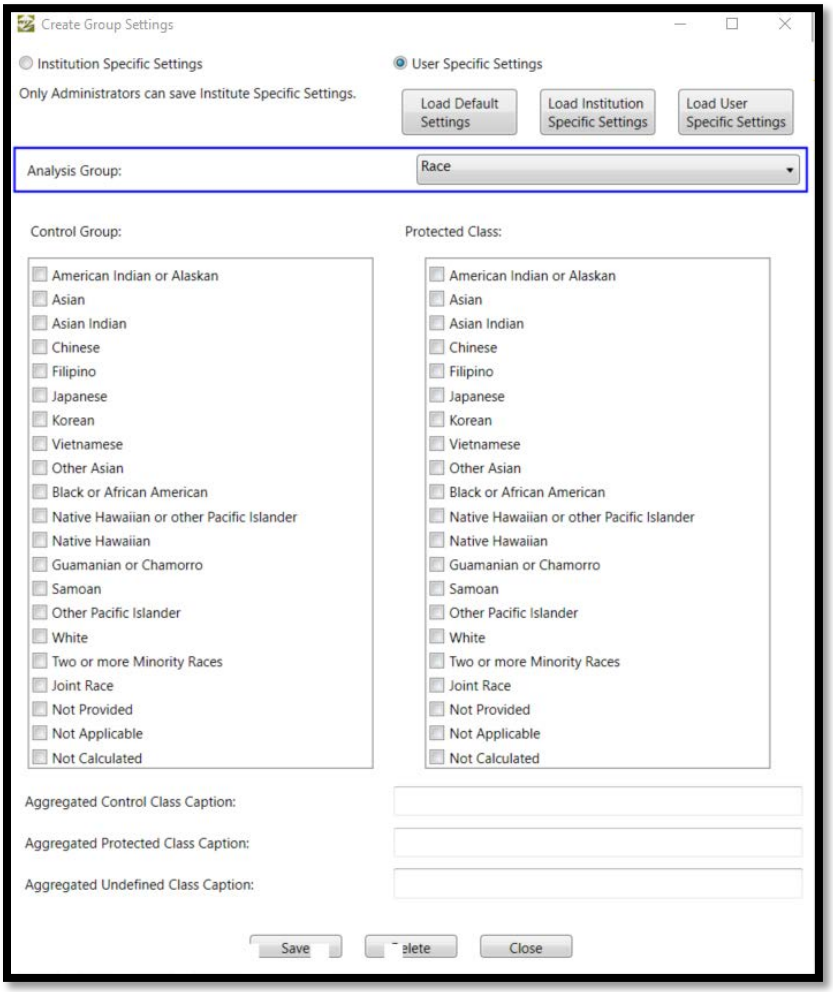
The Minority and Comparator Selections screen allows legacy Fair Lending *Wiz* regression users to select their desired minority and comparator group(s) based on Race, Ethnicity, and Sex. The statistical significance calculations of Minority group(s) vs. the Comparator group for Race, Ethnicity, and Sex will be based on these selections instead of the default groups.



To change the Minority and Comparator Selections for Fair Lending Reports or SaaS based Fair Lending Regression, users can select their desired minority and comparator groups by:

1. Opening Fair Lending Reports
2. Selecting *Create Group Settings*

Another window will open for users to make their selections



Chapter 3 – Importing

Use the **Import Wizard** to import data (**source file**) into the **target file** (the CRA *Wiz* data file). When users import records into CRA and Fair Lending *Wiz*, records from the source file, a file generated from the institution's loan data repository, or a manually created file, will be imported into a new or existing CRA *Wiz* data file. The source file must be imported into the software before users can geocode, edit, and analyze the data.

During the import process, users will create an **import format**. An import format maps the data in the source file into the CRA *Wiz* software. The source file's **record layout,** which describes the structure of the source file, can be used as a guide when creating the import format. To begin, a new import format will need to be created for each different source file type imported into CRA *Wiz*. Once import formats are created, they can be saved for future use.

Import formats must be properly defined to ensure accurate analysis of loan data. When importing loan data into the software, prepare the data so that it meets the institution's fair lending objectives. Quality data is crucial for exam preparation and will help ensure accurate fair lending analysis is completed.

Best Practices for Importing

- ✓ Make sure the action year matches the activity year of the source file, which can be validated and updated on the Summary Information screen
- ✓ Ensure that the source file has all of the required fields for the data type that is being imported
- ✓ Try to keep the source data consistent in structure (column names) from one import to the next
- ✓ Import the source data into CRA *Wiz* on a regular basis, such as monthly or quarterly
- ✓ Avoid importing Excel files, if possible. Excel often contains visual formatting options which may allow the underlying data to look correct when it is not
- ✓ Save Excel files as a comma-separated (.csv) file or a tab delimited (.txt) file and import as a text file. This removes visual formatting options that Excel may assign to a file
- ✓ Identify the data that is being captured for your source file and pay close attention to data format and structure
- ✓ Do not use special characters in the source data headers, field names, or name of the source file (ex. @, #, $, %, ^, &, *) as they cannot be imported into *Wiz.* Instead, use an underscore (_)
- ✓ If possible, have the field names in the source file match the field names in CRA *Wiz* to allow for auto-mapping
- ✓ Save the import format(s) created so they can be used again in the future
- ✓ If the file being imported is going to be geocoded in CRA *Wiz*, the source file must contain address, city, state_abrv, zip and zip4 (even if the latter is blank)
- ✓ If CRA *Wiz* will be calculating rate spreads (recommended) ensure the source file contains:
    - Rate lock date
    - APR
    - Rate Type
    - Loan term (in years)
    - Adjustable term (in years) if RateType is “2” (adjustable rate loan)

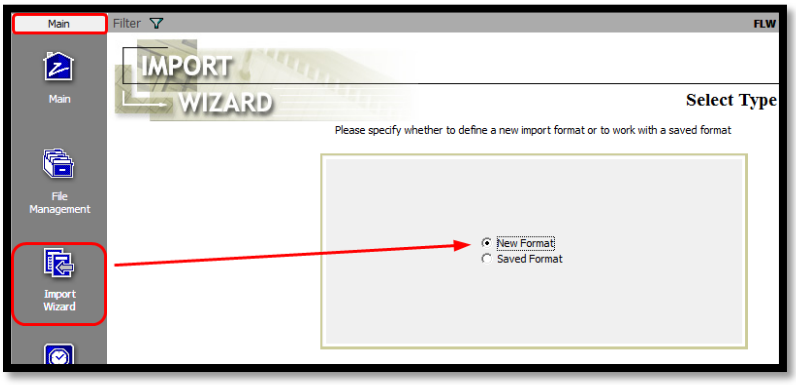
Importing a HMDA DF Data File as a "Base" File for Fair Lending

The importing function in CRA *Wiz* is quite powerful. It allows users to bring in several types of files (Microsoft Access, Microsoft Excel 1997 to 2003 version, Microsoft SQL, or Text files in fixed length or delimited versions).

Users can import a new file, update an existing file, append multiple files together, or any combination of these features. In the examples below, users will learn how to import a new file establishing the base HMDA DF data plus additional fields for geocoding and create several blank fields for updating later.

1. On the **Main** tab, click the **Import Wizard** button

2. **Select Type of Import Format** screen: The import format is the template used to map the fields in a source file to the corresponding columns in CRA *Wiz*



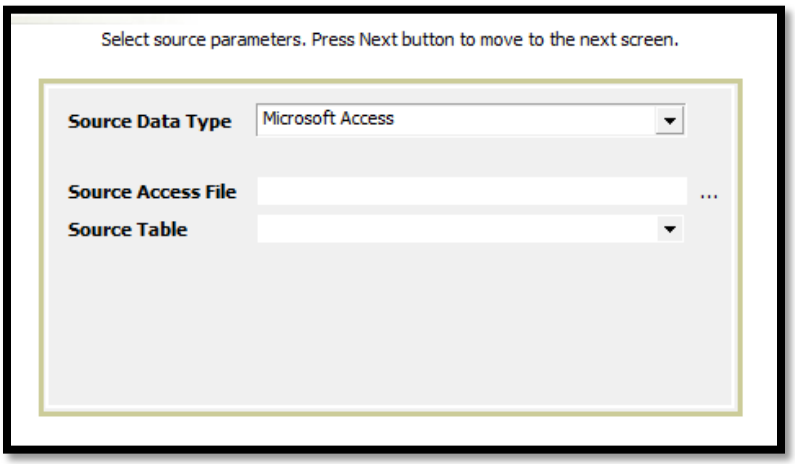
There are two options**:**

- **New Format** – create a new import format
- **Saved Format** – use a previously saved import format

3. Select **New Format** and click the **Next** button to continue to the next screen

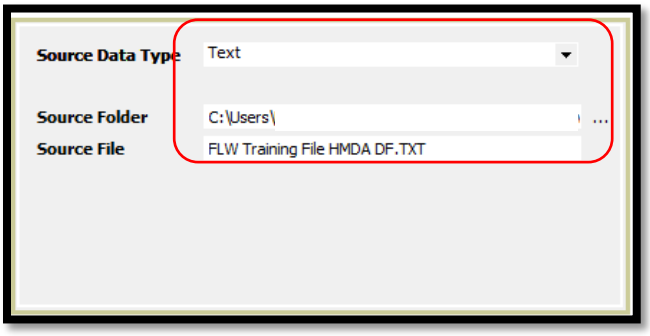
The **Source File Selection** screen includes the following:

- Source Data Type
  - Access
  - Excel
  - SQL Server
  - Text
- Source Folder
  - Click the Ellipsis "…"
- Source File

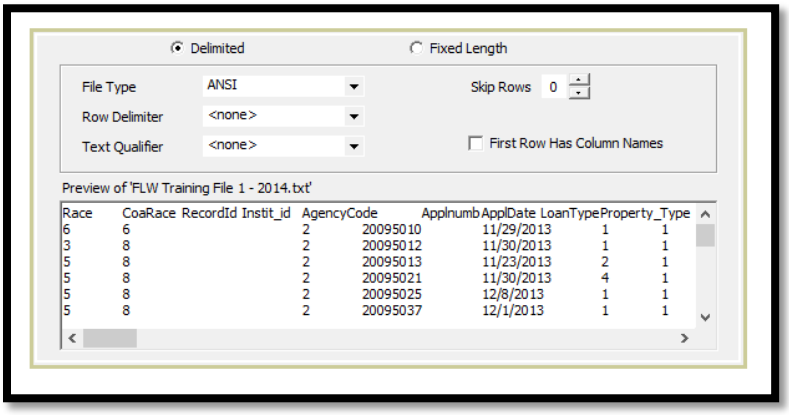


- **Source Data Type** - Click on the drop-down arrow and select the source file type. For more information on source file types and layouts, go to the online CRA *Wiz* Help guide within CRA *Wiz* under Help - Importing > Source File Types > Source File Types Overview

4. **Source Data File** - click on the ellipsis button, a directory box will appear, navigate to the source file and select it
   a. Data Type = **TEXT**
   b. Source Folder = the location of the file to be imported
   c. Source File = the name of the file to be imported "**FLW Training File HMDA DF.txt**"
   d. Click **NEXT**



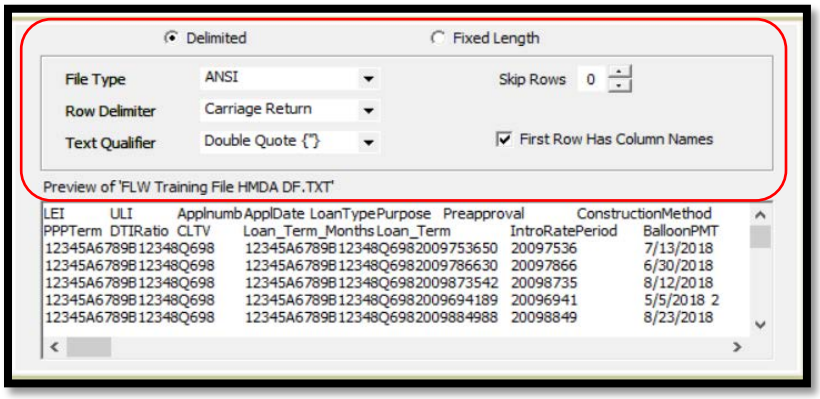
The **Source File Format Selection** screen includes the following:



- **Delimited Radio Button** - the field values for source file records are separated by a special character (semicolon, vertical bar, comma, or tab)
- **Fixed Length Radio Button** - all values for a specific field have the same length
- **File Type** - default value is **ANSI** (required for text files)
- **Row Delimiter** - the character used to separate individual records in the data file Possible values are **Carriage Return** and **None**
- **Text Qualifier** - text fields in the source file may be enclosed with special characters to differentiate them from other fields. Possible values are **Double Quote** (**" "**), **Single Quote** (**' '**) and **None**
- **Skip Rows** - if the loan records are preceded by one or more rows of data **other than** the column heading information, enter the number of rows. For example, the source file includes two rows of descriptive information, the file name and the date the file was generated, two rows preceding the header row would be skipped
- **First Row Has Column Names** - select this if the row preceding the loan record information in the source file includes the names of the source file fields. The column names automatically display as column headers on the **Text File Column Delimiter Selection** screen
- **Record Preview** - displays the records in the source file

For this example:

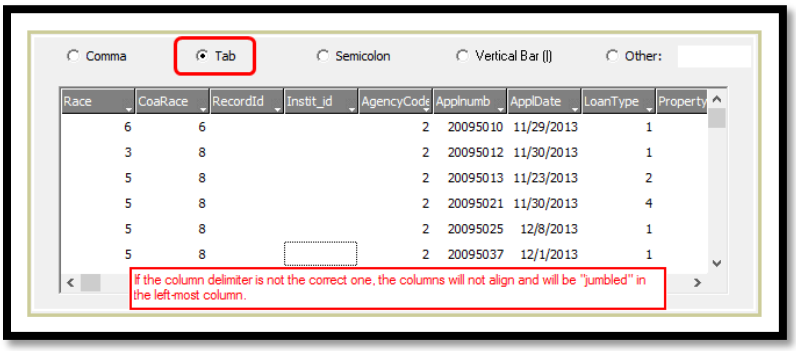
5. Radio Button = "**Delimited"**
   a. File Type = **ANSI**
   b. Row Delimiter = "**Carriage Return"**
   c. Text Qualifier = **"Double Quote"**
   d. Select "**First Row has Column Names"**
   e. Click **Next**



The **Text File Column Delimiter Selection** screen allows you to select the type of column delimiter:

- Comma
- Tab
- Semicolon
- Vertical Bar (|)
- Other

6. Select "**Tab**" radio button
   a. Click **Next**

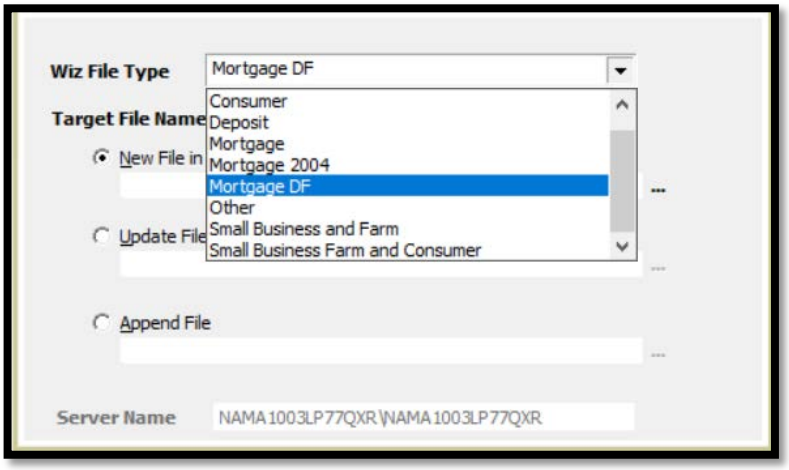


The **Target File Selection** screen includes the following:

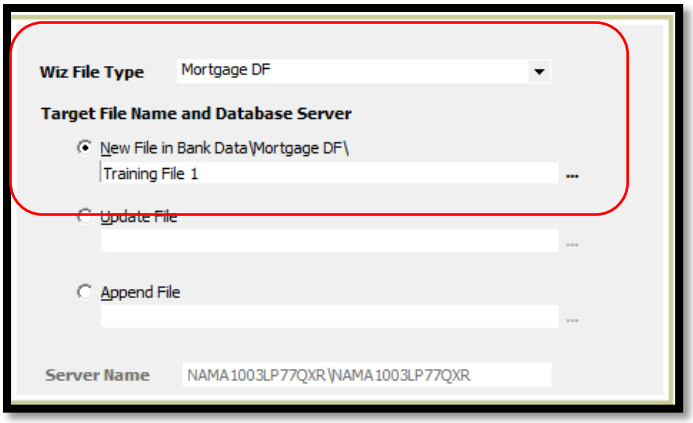
- The ***Wiz*** **File Type** drop-down box lists the file types available for importing

- **Target File Name** offers three options:

  - **New File** - import a new file into the software
  - **Update File** – update the information in an existing *Wiz* file by specific, or all columns
  - **Append File** - append records to an existing Wiz file



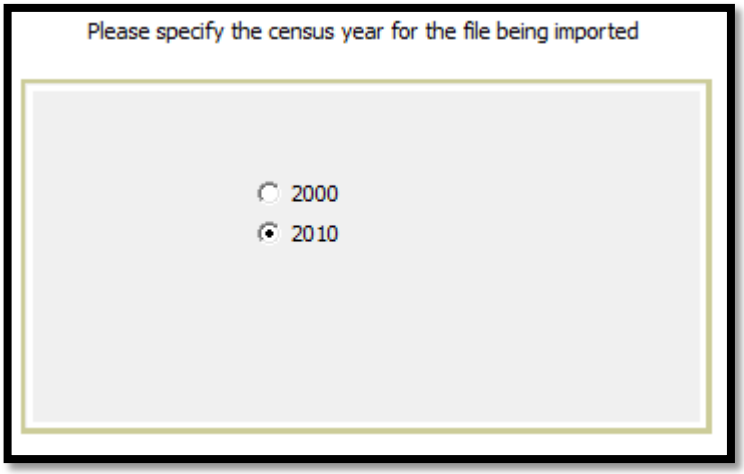
7. Make Selections
   a. *Wiz* File Type = "**Mortgage DF"**
   b. New File Name = "**Training File 1**"
   c. Click **Next**



On the **Census Year Selection** screen, there are the following options:

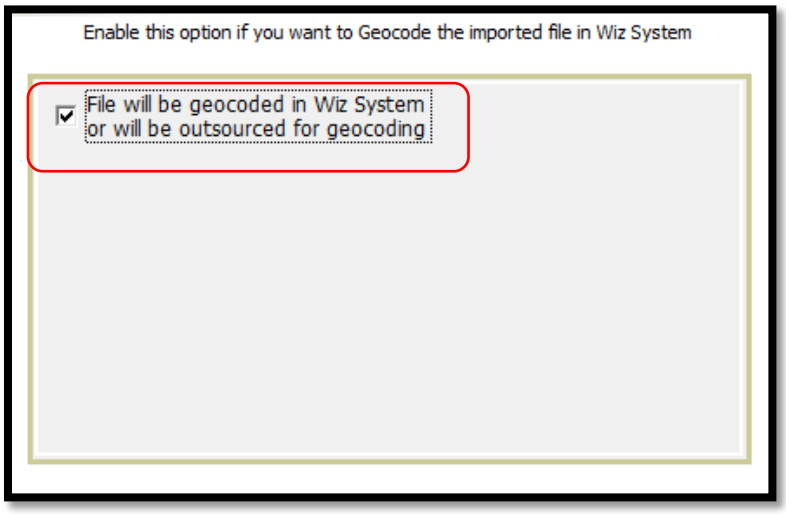
- Census 2000 - import a loan file using 2000 census tract boundaries for action dates from 2003 through 2011
- Census 2010 - import a loan file using 2010 census tract boundaries for all action dates after 2011

8. Select the Census Year, for this example:
   a. Census Year = "**2010**"
   b. Click **NEXT**



On the Geocode Settings screen, there is only option. If you want to CRA *Wiz* to geocode your file, select that option here.

If you do not want to geocode the file, do not select this check box.



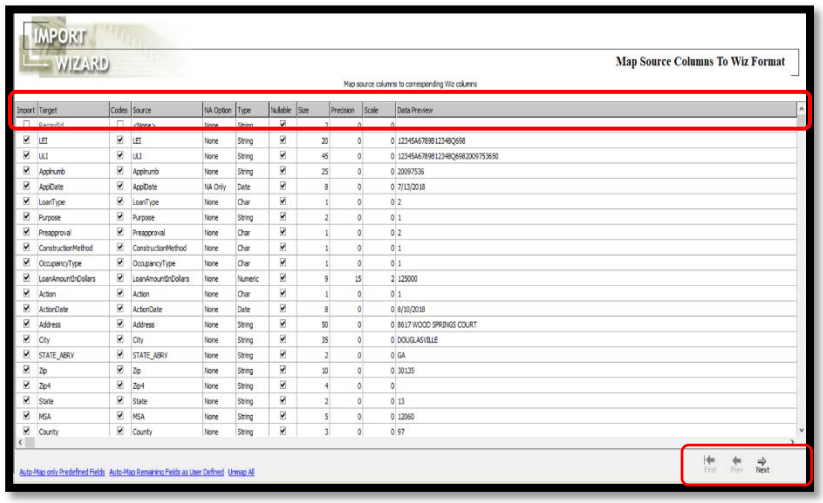
If your institution does NOT use CRA *Wiz* to geocode, the data below must be supplied in the source data file. However, if the file is not geocoded within *Wiz* (from Address, City, State_Abrv and Zip), the file will not include Latitude, Longitude, Block or Block Group.

- State
- MSA
- County
- Census Tract

9. For this example:
   a. Place a **checkmark** in the "File will be geocoded in *Wiz*…"
   b. Click **Next**

The **Define Map Source Columns to *Wiz* Format** screen contains the following columns:

- **Column 1**: **Import** - displays a check mark next to the fields that have a matching data source and will be imported into the software



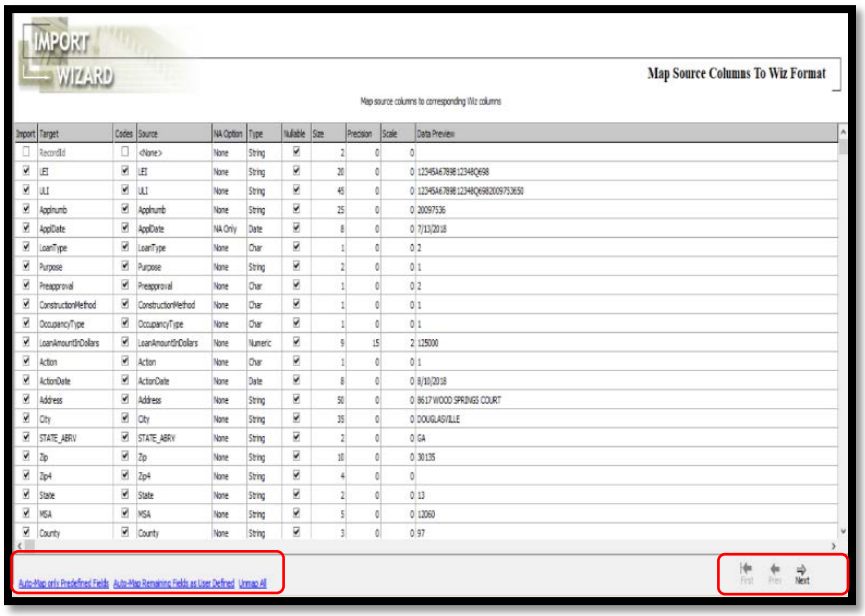
If a field does not have a check mark, *Wiz* will not import the field.

- **Column 2**: **Target** - displays the name of the fields that will appear in the *Wiz* file after importing
- **Column 3: Codes** - displays the government issued codes assigned to each of the required fields
- **Column 4: Source** - displays the name of the fields that are in your source file
- **Column 5: Type** - displays if the target field is character, numeric, integer, boolean, string, memo, date and float
- **Column 6: Nullable** - displays a check mark next to the target fields that allow fields to be blank
- **Column 7: Size** - displays the length of each target field
- **Column 8: Precision** - displays the total number of digits in the column (digits before the decimal point plus digits after the decimal point – even if these digits are not displayed)
- **Column 9: Scale** - displays the number of digits after the decimal point
- **Column 10: Data Preview** - displays a preview of the data as it will appear after *Wiz* imports the loan file
- **Navigation Buttons** – **First** record, **Previous** record, **Next** record

Click the "**Auto-Map…"** links at the bottom of the screen to have the system automatically map the fields in the source file to the Target column fields.

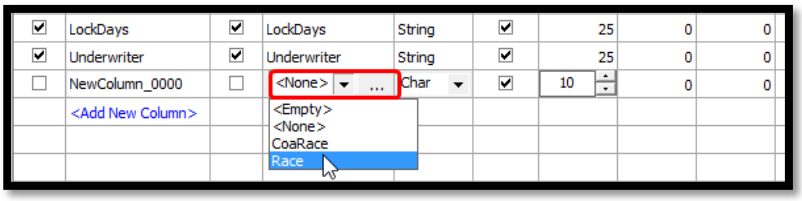
- The **Auto-Map only Predefined Fields** link automatically maps the fields in the **Source** column and lists the fields in the **Target** column only if the source field matches the CRA *Wiz* ***predefined*** field name. If the software could not match a field, the corresponding source field displays **<none>**. In these instances, the user will have to manually map the source field
- The **Auto-Map Remaining Fields as User Defined** link automatically maps any remaining unmapped user defined fields in the file (target) to any user defined fields in the system (source) that have matching field names and a default data type of **Varchar 25** (variable character length of 25)

10. For this example:
    a. Click on the "**Auto-Map only Predefined Fields**" link
        i. Review fields that were auto-mapped
    b. Click on the "**Auto-Map Remaining Fields as User Defined**" link
        i. Review remaining fields that were auto-mapped
    c. Review additional records by clicking on **Next** (in Navigation, not the next step button)
    d. Click **First** to return to the first record
    e. Click **Next**



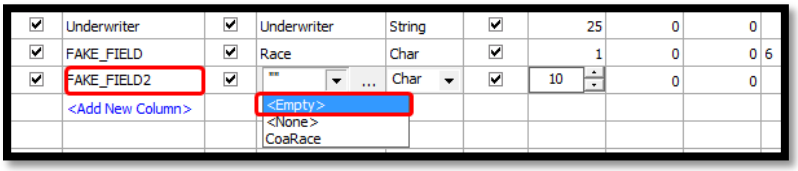
11. To manually match fields in the source file to the corresponding fields in the CRA *Wiz* target file, or to create a new field to be filled in later:

    a. **Scroll down** to the bottom of the field list
    b. **Click** <Add New Column>
    c. In the SOURCE column, **click the drop-down list** to see a list of fields not yet mapped

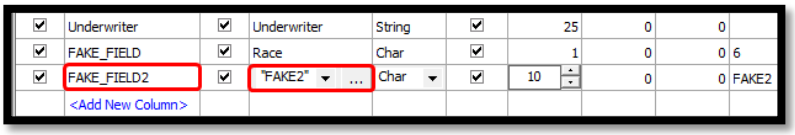


    d. **Click on an available field** (in this example, **click on RACE**), then double-click in the Target field name (NewColumn_0000)
    e. With the field highlighted in blue, type in the new name **FAKE_FIELD**
    f. Change FAKE_FIELD from a Char field with a size of 10 wide to a **Char field** with a size of **1 wide**

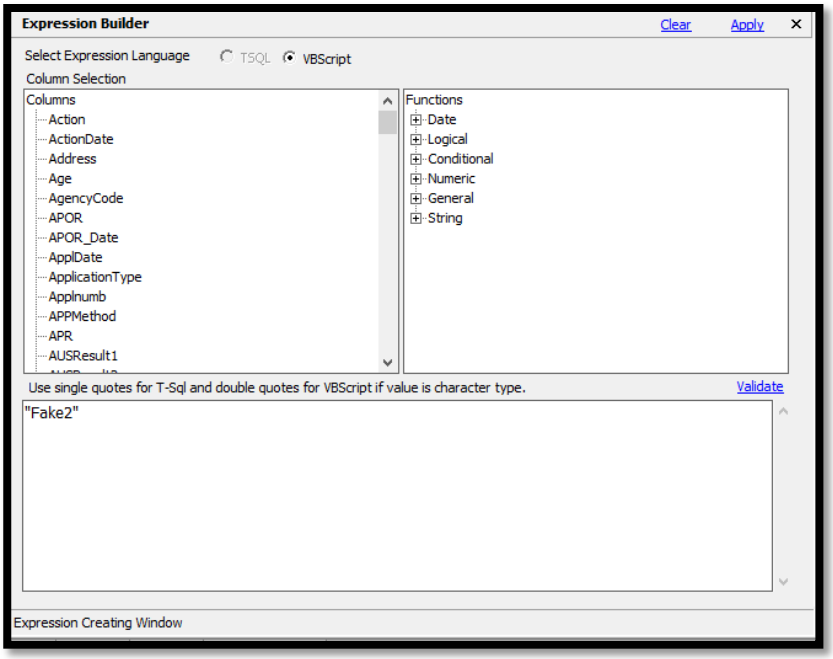
12. To add a new "empty" field
    a. **Click** <Add New Column>
    b. In the SOURCE column, **click the drop-down list** to see a list of fields not yet mapped



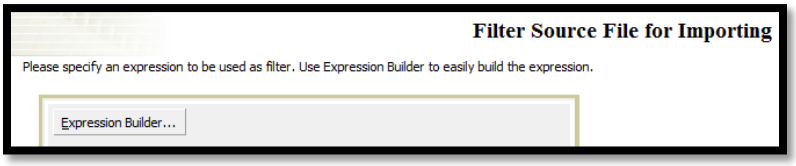
    c. **Click on the word "Empty"**, then double-click in the Target field name (NewColumn_0001)
    d. With the field highlighted in blue, type in a new name **FAKE_FIELD2**
    e. Leave this field as a **Char** with a size of **10** wide



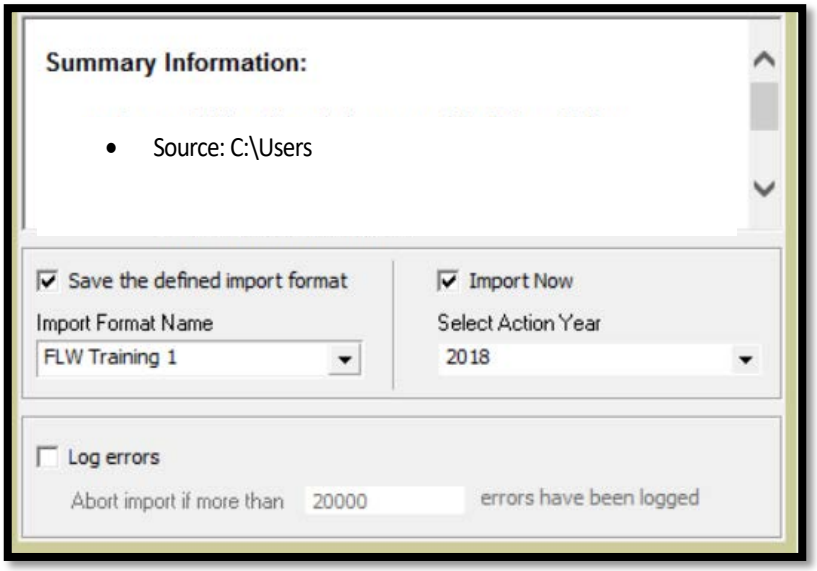
f. To type in a value in this field, **click on the Ellipsis** next to the empty quote marks. Place the cursor in the Expression Builder's **Expression Window**, and **type in "FAKE2" (with double quotes)**
g. **Click Apply**
h. **Click Next**



13. In this example, we will not be applying a filter
a. Click **Next**



14. The **Summary Information** screen:
a. Save the Defined Import Format – **Check the box**
b. Enter the import format name, in this case: "**FLW Training 1**"
c. Click the **Import Now** checkbox
d. Change the Activity Year to match the data year in the source file, in this case **2019**
e. Click **Finish**

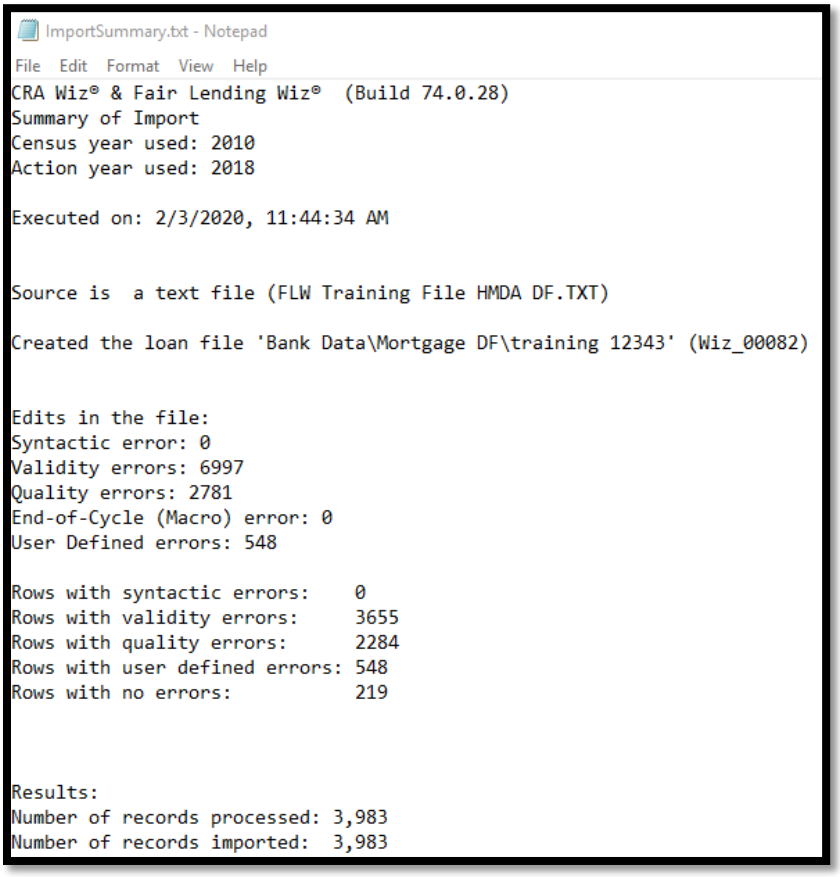


The **Log Errors** function allows users to set a total number of errors the system will allow before aborting the import process. Once the system reaches that number, the import will no longer continue. Clients with very high record counts may consider using this feature. It may be easier to correct an error directly in your loan origination system.

15. Click **Yes** to display the summary report

The **Import Summary** report displays the following:

- Date and time of import
- Source file used
- Target file created
- Total number of errors (syntactical, validity, quality)
- Rows with errors
- Number of records processed

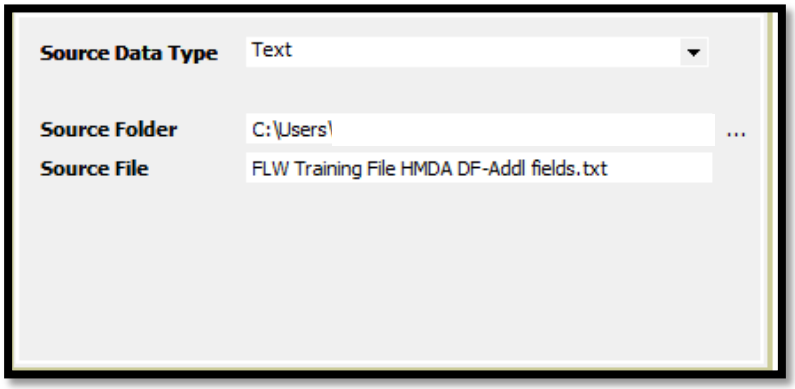


16. **Click the 'X'** in the upper right corner of the report. The software closes the summary report and displays the CRA *Wiz* **Main** screen. The file imported now shows as the current file

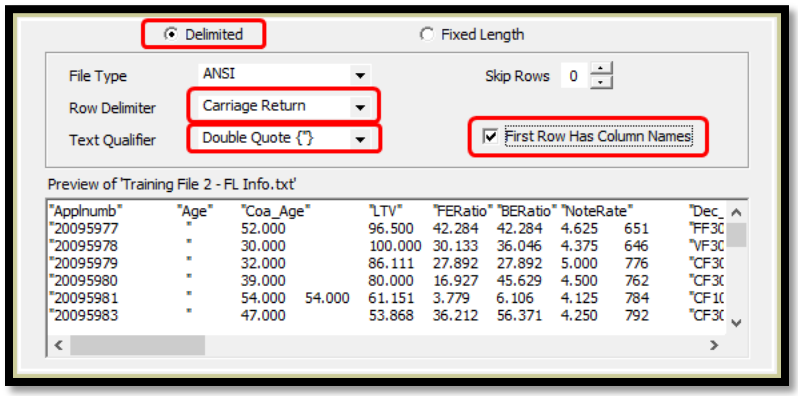
Updating an Existing File

For the example institution used in this manual, the HMDA DF file was used as the "base" information, with additional information coming from other sources (such as the Loan Origination System).

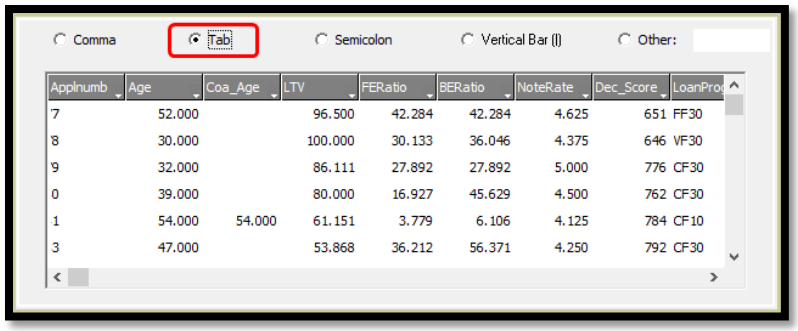
1. Follow the steps of the Import Wizard:
   a. Click on the **Import Wizard** button
   b. Select **New Format**
   c. Click **Next**
   d. Source Data Type = **Text**
   e. Source Folder = **[as instructed]**
   f. Source File = **FLW Training File HMDA DF-Addl fields.txt** (either click 'Open" or double-click on file)
   g. Click **Next**



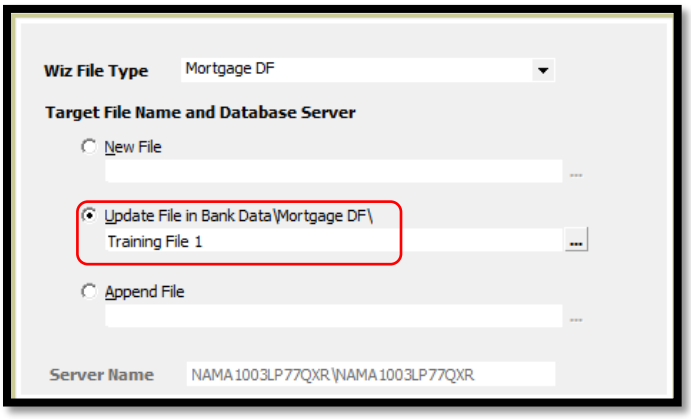
2. Populate information about the file being imported, for this example:
   a. File type = **Delimited**
   b. Row Delimiter = **Carriage Return**
   c. Text Qualifier = **Double Quote**
   d. First Row Has Column Names = **Checkmark**
   e. Click **Next**



3. Delimiter = **Tab**



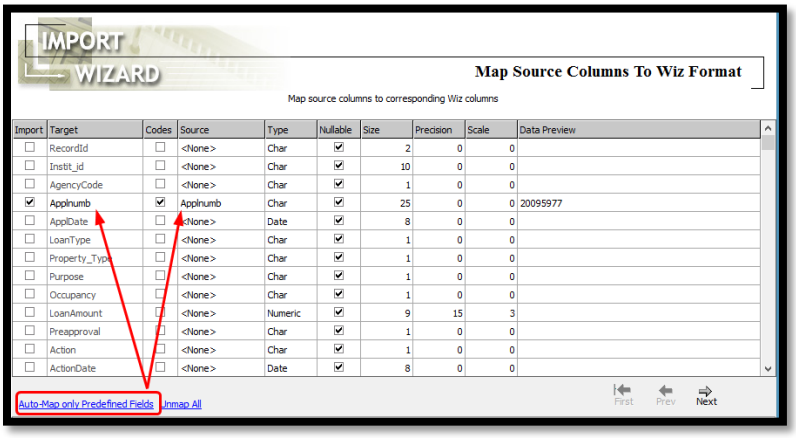
4. On the Update File in Bank Data \Mortgage DF folder **click the Ellipsis**
5. Select the name of the source file being imported that will update the current file. In this case, **Training File 1**
6. Click the **Open** button
7. Click **Next**



The fields that needed updating were brought in as empty fields in the initial import. The field names were added into Excel 2013, in Row 1, with no additional information. The file was then saved as a Tab-Delimited file (".txt").

One critical field in the process is known as the "Key" field (the field that identifies which records get updated with the new information). The APPLNUMB field (application number) is the Key field in this case.

8. Map Source Columns to *Wiz* Format:
   a. On the Map Source Columns to *Wiz* Format screen, click **the Auto-Map only Predefined Fields** link at the bottom of the screen
   b. **Scroll down** to see the other fields that were mapped

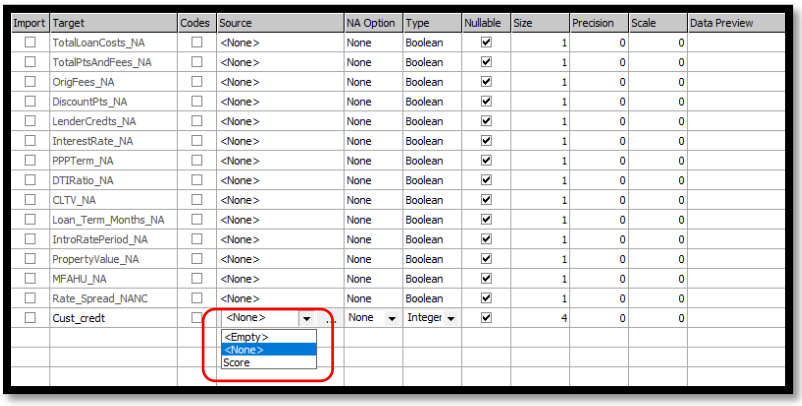


Other field widths can also be changed. For example, if the field called LoanProgram is longer than 25 characters wide, you would need to change to the proper width, but not longer than needed. Use the next record button to see what other values are included**.** Do not truncate valuable information by setting the field width too small.

9. For this example:
   a. FERatio – Numeric, 9, 15, 2
   b. LoanProgram - Char, increase Size to 30
   c. Employee – Char, decrease Size to 20

In the event a column does not map from the source file to the target file, it can be added using manual mapping.

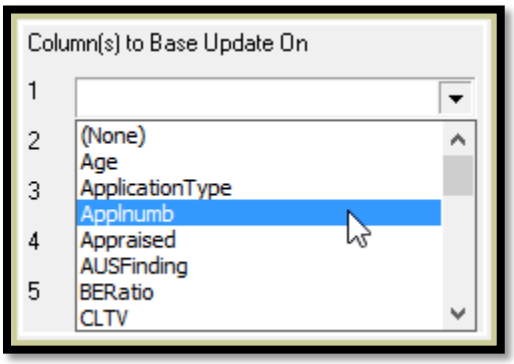
10. For this example:
    a. In the Source column, **click on the word None** in the Row containing the field you wish to add, in this case, Cust_Credt
    b. Click on the drop-down arrow to open the list of fields, then click on the matching field name, in this case **Score**
    c. Change the Type match the data type you wish to add to the file, in this case we will select **Integer**
    d. Click **Next**



The **Matching Column Selection** screen displays only when a file is being updated. When updating a file, records from the source file are imported into an existing CRA *Wiz* target file.

- Users can select up to five match columns. These are the columns (fields) used to match records in the source file and the target file
- Every record in the target file that has a matching record in the source file can be updated (if the field was selected in the previous step) with new information imported from the source file if the record has been changed in the source file
- All records in the source file that do not match an existing record in the target file can be added (also known as appended) to the target file, depending upon the next screen's selections

11. For this example:
    a. Select **APPLNUMB** as the Column to Base Update on
    b. Click **NEXT**

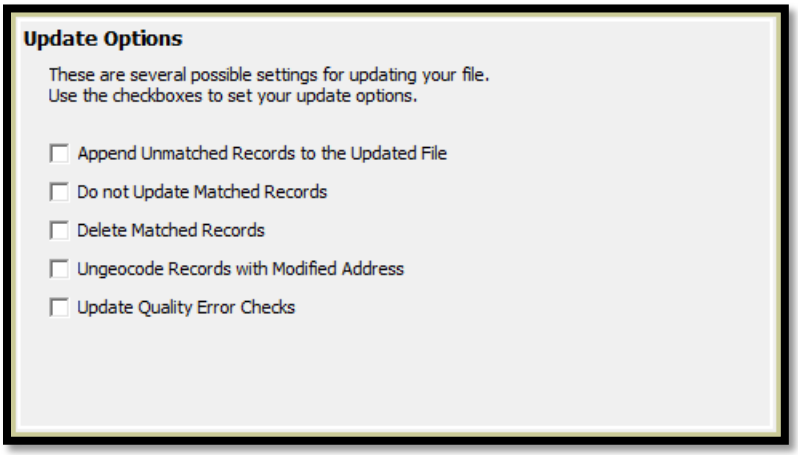


The **File Update Option** screen displays only when a file is being updated and is used to select the options used to update the target file.

- **Append Unmatched Records to the Updated File** appends all unmatched records to the existing *Wiz* file

- **Do not Update Matched Records** select this option if you do not want *Wiz* to update matching records in the existing file (append unmatched records only)

- **Delete Matched Records** - deletes all matched records in the target file (e.g., records that were imported in error, such as pre-qualifications)
- **Ungeocode Records with Modified Address** - ungeocode all records in the existing *Wiz* file whose addresses differ from the source file
- **Update Quality Error Checks** updates all the quality error checks in the existing *Wiz* file

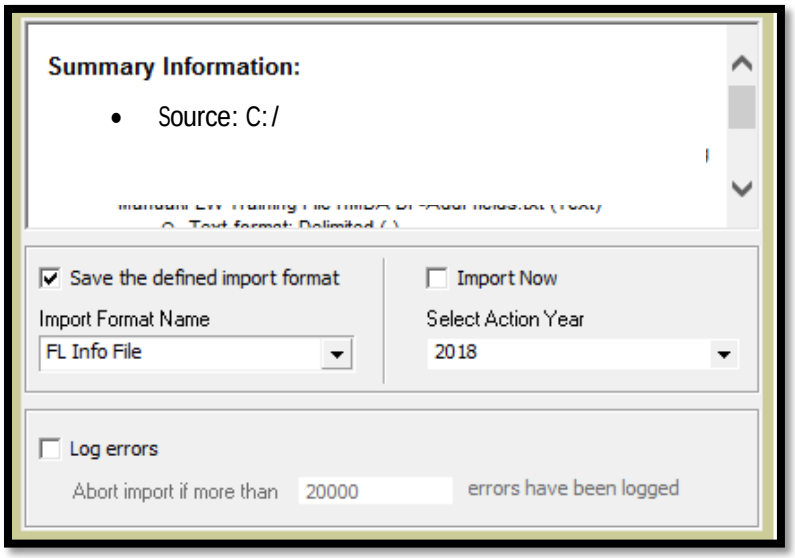


12. For Training purposes:
    a. **Uncheck all 5 boxes**
    b. Click **NEXT**

Expression Builder button - use this button to display the Expression Builder. You use the Expression Builder to create expressions to filter your source data.

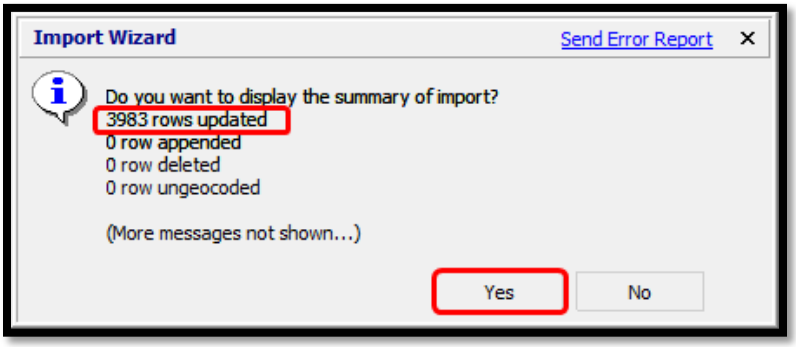
For this example, no additional expression will be applied on the **Filter Source File for Importing** screen.

13. Click **Next**
14. The Summary Information Screen:
    a. Check the "Save the defined import format" box if you wish to save the import format created
    b. Double-click into the "Import Format Name" textbox. When cursor is flashing in an empty box, enter the name of the import format you wish to save, in this case "**FL Info File**"
    c. Check the "Import Now" box
    d. Select the Action Year that matches the source file, in this case, **2018**
    e. Click the **FINISH** button



The Import Wizard indicates that 3,983 records were UPDATED, no records were APPENDED, no records were DELETED, and no records were ungeocoded.

15. Click **YES** to see the Summary Information report and review
16. Close the **Summary Report**



Other Features

Instructions for the following other features can be found in the CRA *Wiz* Training Manual – Data Prep:

- Creating Replace Commands upon Import
- Modifying Your Import Format
- Transferring/Installing Saved Import Formats

Chapter 4 - Geocoding Records

Geocoding is the process of appending numeric geographical data codes for MSA, state, county, and census tracts to records. Valid addresses (street, city, state, ZIP code) are required for accurate geocoding.

Geocoding your records ensures the anonymity of the records and enables your institution to analyze data based on census tract boundaries. Properly geocoded records include geographical coordinates (latitude & longitude) required for creating maps within CRA *Wiz* showing activity or branch locations.

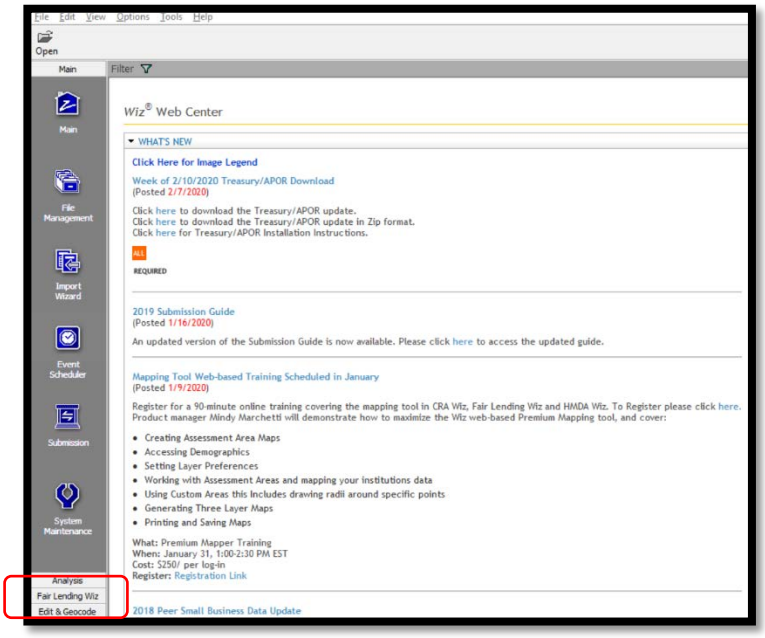
- There are three ways to geocode records in CRA *Wiz*: batch geocoding, single record geocoding, and interactive geocoding
  - Batch geocoding reviews all addresses in the application or file and geocodes all records in the file that have valid addresses
  - Single record geocoding obtains geocoding information for an individual address
  - Interactive geocoding geocodes individual records that do not geocode during batch geocoding

Batch Geocoder

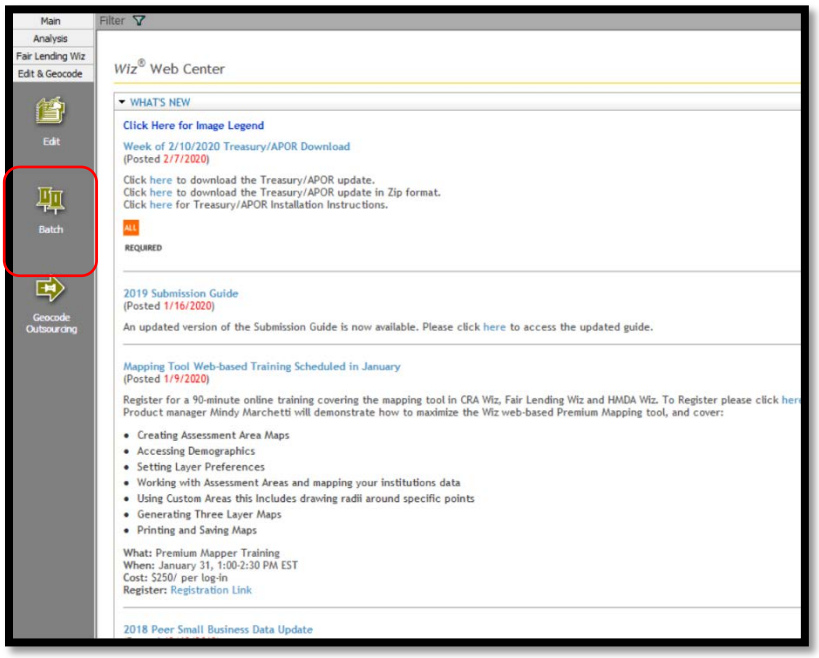
Accessing the Batch Geocoder

To batch geocode records, follow these steps:

1. Click the **Edit & Geocode** tab



2. Click the **Batch** button from the Edit and Geocode tab

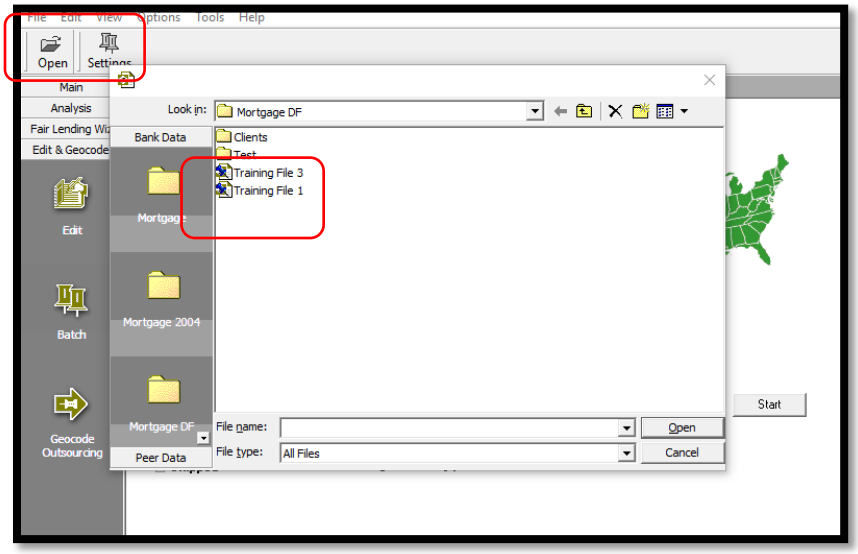


Setting the Current File for Geocoding

Exercise: Once CRA *Wiz* imports a file, that file becomes the current and active file in the program. However, we are going to Geocode the **Mortgage DF YTD** file. Follow the steps below to learn how to change from one file to another.

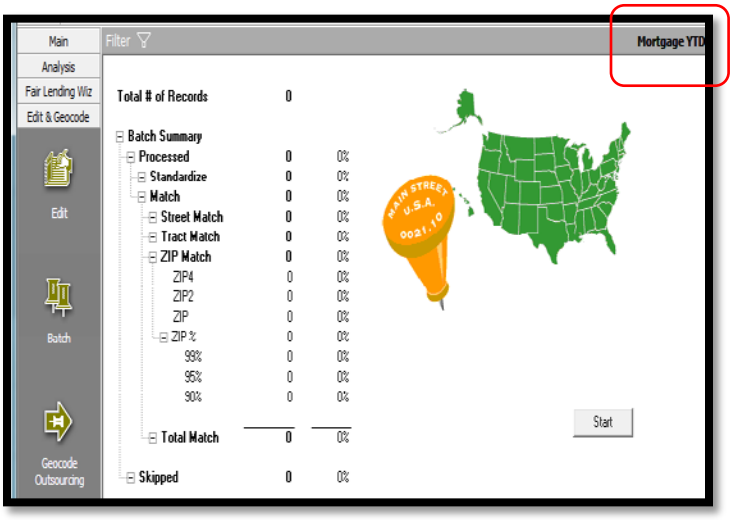
To change the current file, follow these steps:

3. On the **Batch Geocode** screen, click the **Open** button



4. Double click on the **Training File 1** from within the Mortgage DF folder

5. The software displays **Training File 1** file as the active file

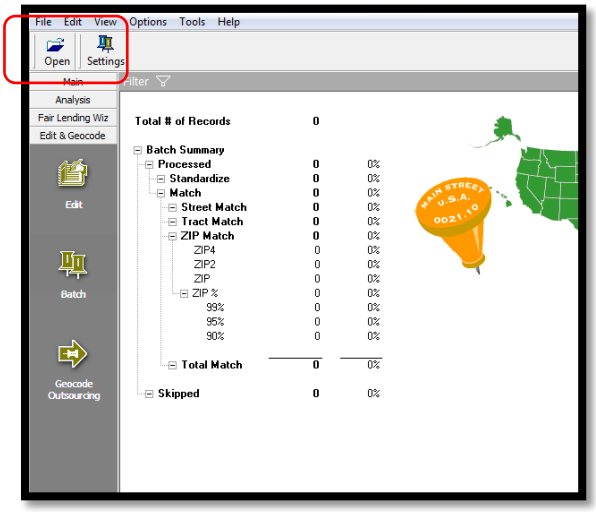


Understanding and Applying Geocode Settings

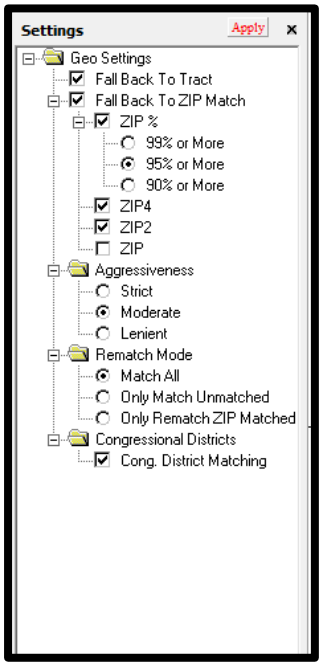
The options selected in the **Settings** pane determine the level at which CRA *Wiz* geocodes records from the street address down to ZIP Code matches.

To access the geocode settings, follow these steps:

1. Click the **Settings** button



2. For this example, select the following:
   a. Fall Back to Tract
   b. Fall Back to Zip Match
   c. ZIP%: 95% or More
   d. ZIP4
   e. ZIP2
   f. Aggressiveness: Moderate
   g. Rematch Mode: Match All
   h. Click Apply



Match All setting instructs the system to geocode all records. Only Match Unmatched setting instructs the system to only geocode those records that are not geocoded. For fair lending, Match All records if the file is not geocoded.

Geocode Settings

Setting	Definition
Fall Back to Tract	This selection allows the geocoder to match the address to a census tract when the street falls entirely within a single census tract, if the geocoder cannot match the loan record's street address.
Fall Back to Zip Match	Zip match selections allow the geocoder to match a record to a zip code in the geocoder's address reference database, if the geocoder cannot match the street address to a census tract.
	This selection will allow the geocoder to match unmatched addresses to the Zip+4 codes
---- Zip 2	This selection will allow the geocoder to match unmatched addresses to the Zip+2 codes
---- Zip%	This selection will allow the geocoder to automatically centroid unmatched addresses to census tracts if the selected percentage of the Zip Code is within a single census tract.
---------99%	If 99% of the loan record's zip code falls within a single census tract, the geocoder will match the record to that census tract.
-------- 95%	If 95% of the loan record's zip code falls within a single census tract, the geocoder will match the record to that census tract.
-------- 90%	If 90% of the loan record's zip code falls within a single census tract, the geocoder will match the record to that census tract.
---- Zip	This selection will allow the geocoder to match unmatched addresses to the centroid (center) of the loan record's five-digit zip code.
Aggressiveness	Aggressiveness selections determine the geocoders matching requirements.
---- Strict	This selection instructs the geocoder to return a match only when the house number, side of the street, street type, street direction, and zip code match a record in the geocoder address reference database.
---- Moderate	This selection instructs the geocoder to return a match only when the house number and street direction or house number, side of the street, and street type match a record in the geocoder address reference database.
---- Lenient	This selection instructs the geocoder to return a match only when the house number and side of the street match a record in the geocoder address reference database.
Rematch Mode	Rematch mode selections will determine which records the geocoder attempts to match during the batch process.
---- Match All	This selection instructs the geocoder to geocode all records.
---- Only Match Unmatched	This selection instructs the geocoder to geocode only ungeocoded records.
---- Only Rematch Zip Matched	This selection instructs the geocoder to geocode only records that geocoded using a zip fallback.
Congressional Districts	
----Cong. District Matching	Select to match addresses to Congressional Districts as well as Census Tracts.

Batch Geocoding

Batch geocoding is the process of geocoding multiple records simultaneously. The CRA *Wiz* batch geocoder matches all valid addresses in a file with corresponding geographical data.

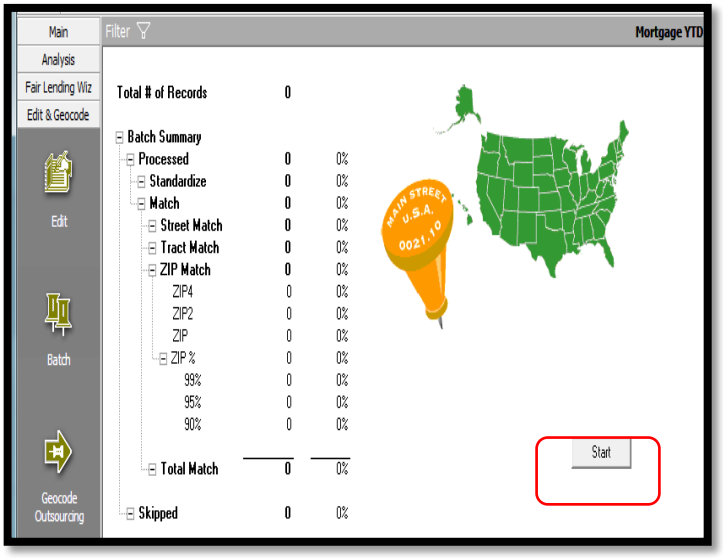
To begin the process, the user will select the batch geocode settings and initiate batch geocoding on the Batch Geocode screen.

After confirming the Batch Geocoding settings, run the batch geocode process, and then determine how many records could not be matched.

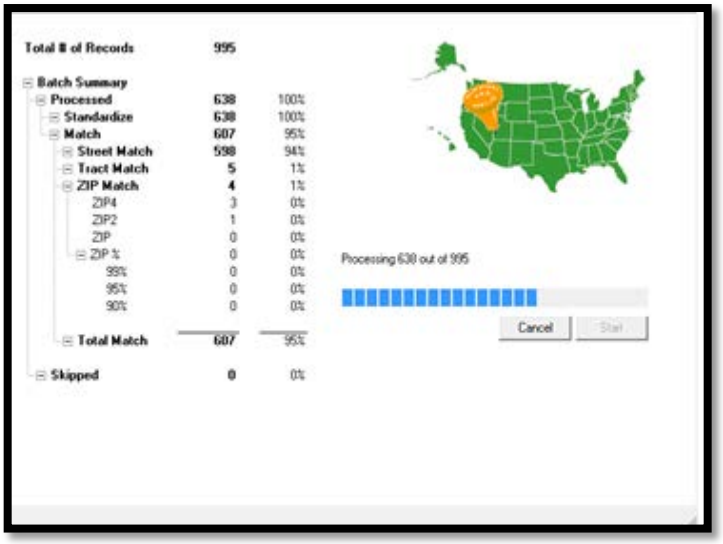
The number of matched records is largely dependent on the accuracy of the source data. Ensuring that loan or application data is entered correctly into the institution's database will help increase the batch geocoder's match rate and may also help avoid extensive data editing later.

To batch geocode records, follow these steps:

1. Click the **Start** button

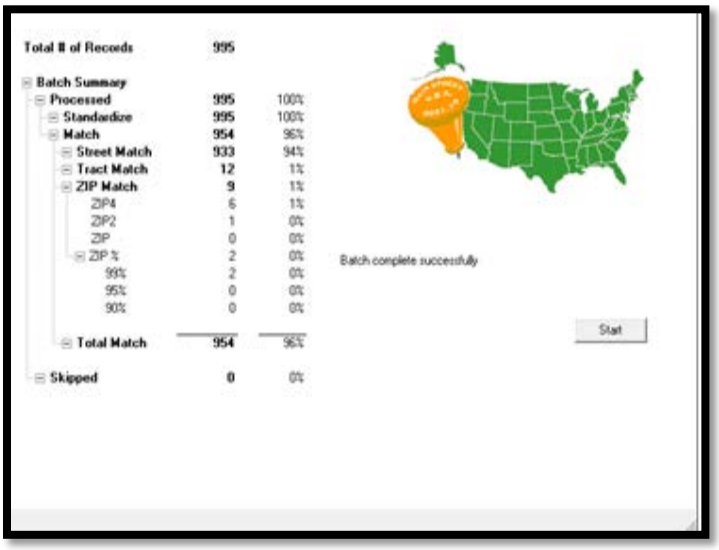


The software geocodes the file.

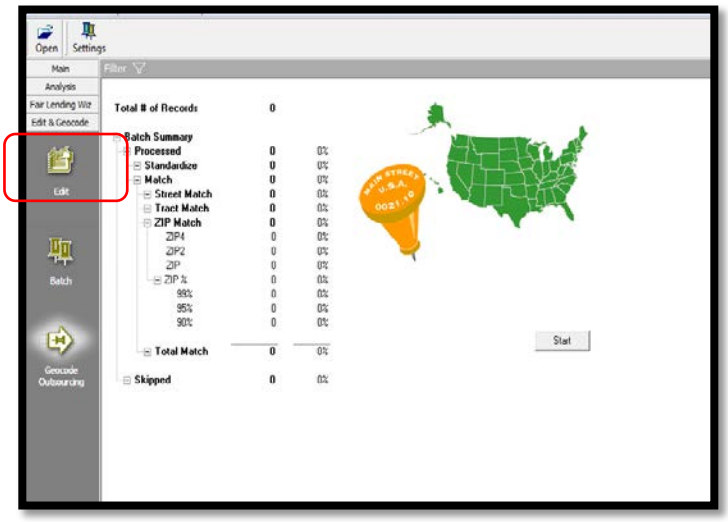


Reviewing the Batch Summary Report

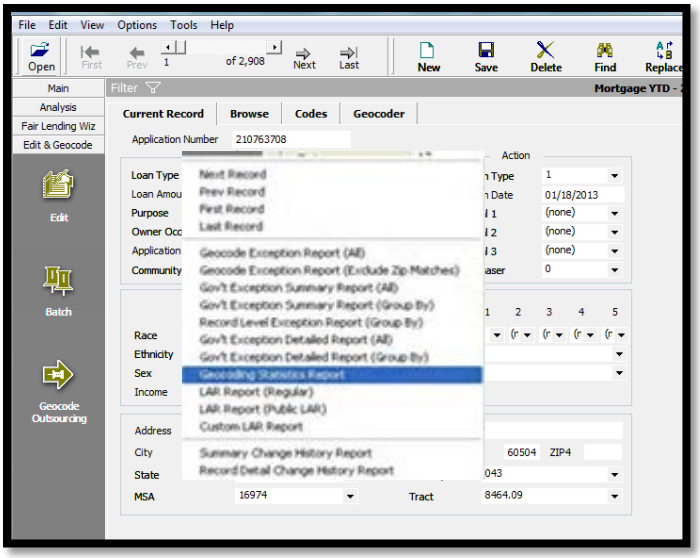
Overview: When a file is geocoded in the batch mode within CRA *Wiz*, the software reports geocoding results in the Batch Summary report. You use the Batch Summary report to determine how many records batch geocoded.



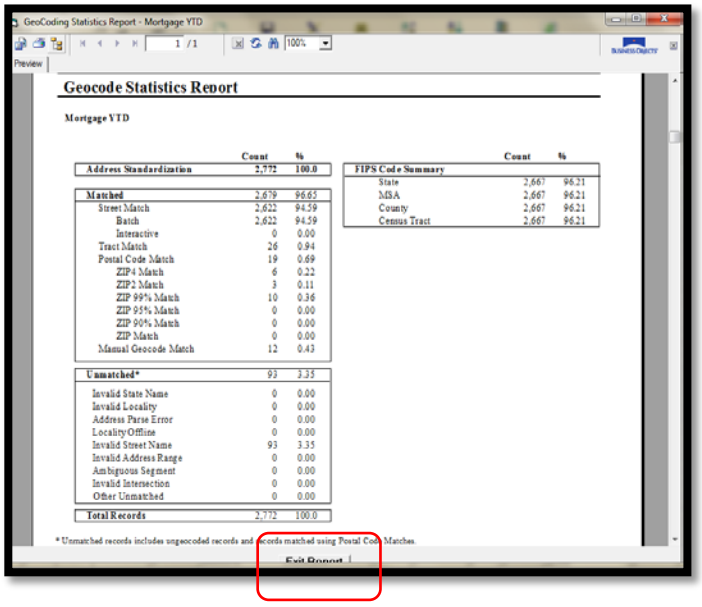
2. To access the **Edit** menu, you must access the Edit module



3. Click the **Edit** menu from the tool bar and select the **Geocoding Statistics Report**



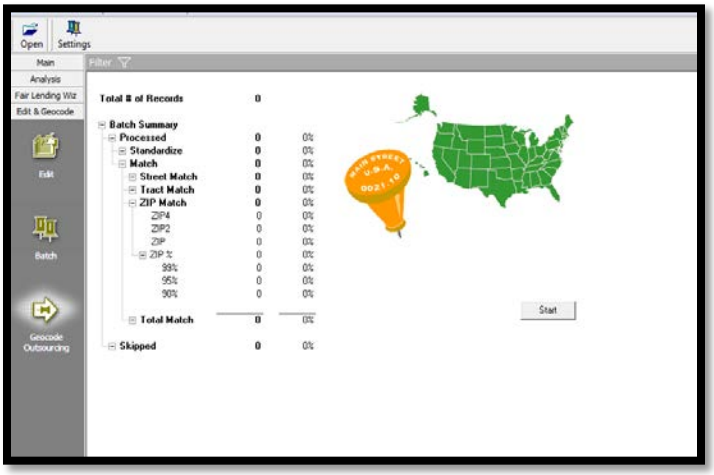
4. Once the statistics report generates, the user has the option of printing the report. **Print** or Click **Exit Report** to close



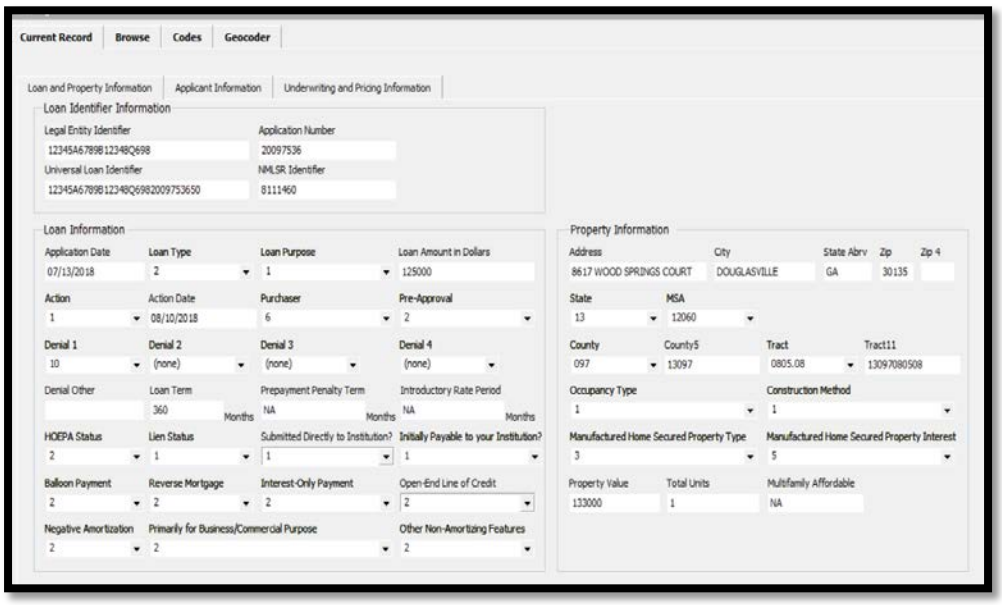
Reviewing the Geocode Exception Report

To review geocode exceptions, follow these steps:

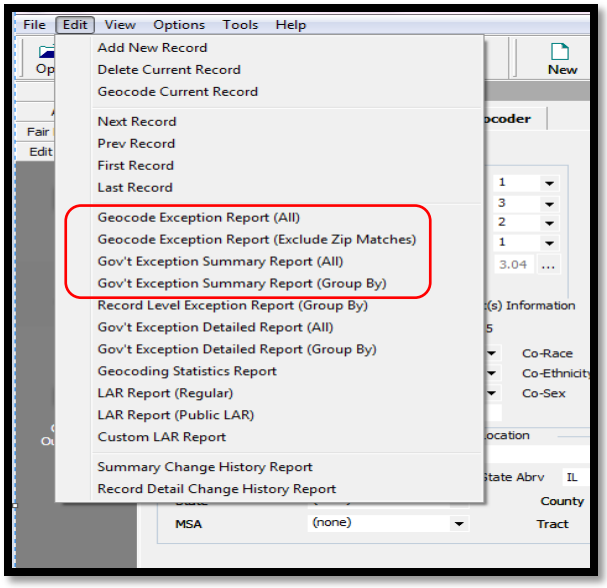
1. From the **Batch Geocode** screen, click the **Edit** button



2. Click the **Edit** menu located on the top tool bar



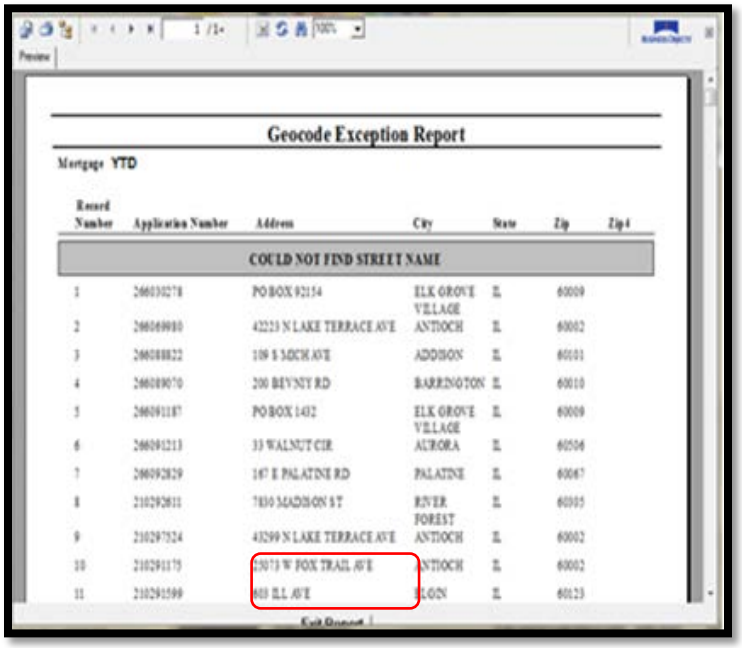
3. Select **Geocoder Exception Report (All)** from the **Edit** drop down list



The following functions can be found on the tool bar:

- Export Report
- Print Report
- Toggle Group Tree
- Next Page
- Last Page
- Page 1 of x
- Stop Loading
- Refresh
- Find
- Exit Report

4. Use the **scroll bar** to review the error messages and account information
5. When finished reviewing the **Geocode Detail Exception Report (All),** click the **Exit Report** button

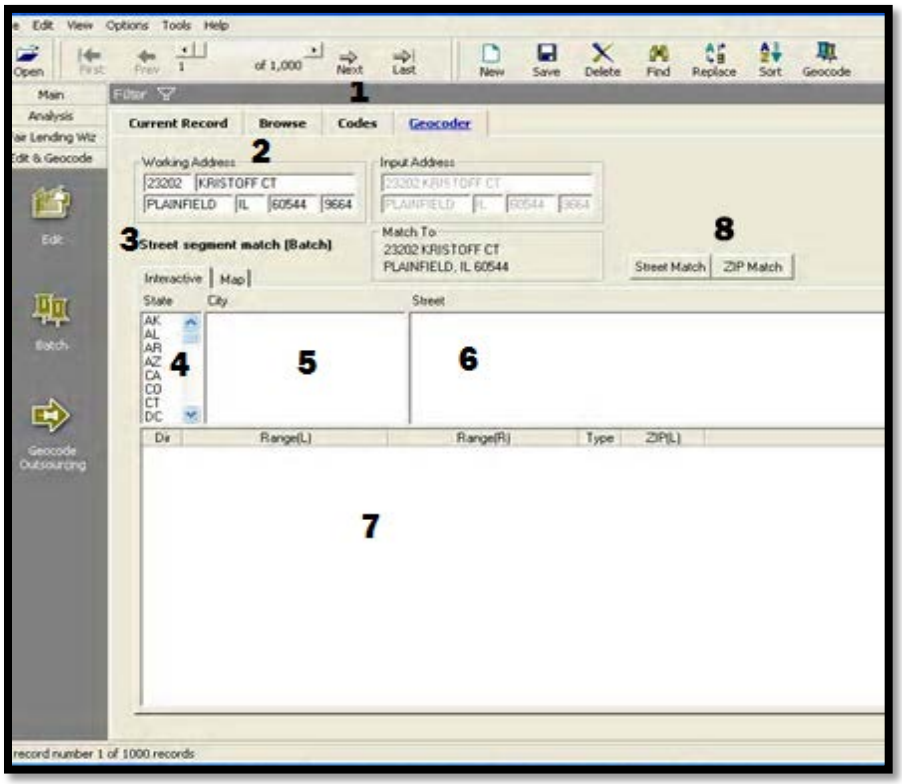


Geocoding Individual Records that do not Batch Geocode

Understanding Interactive Geocoding

Based on the quality of address data in the file, there may be some records that do not geocode during batch geocoding. For example, records entered with spelling errors, P.O. Box, rural route as an address, no address, or properties located in a new development will not geocode. You can geocode these records interactively by matching the address information to a variety of criteria.

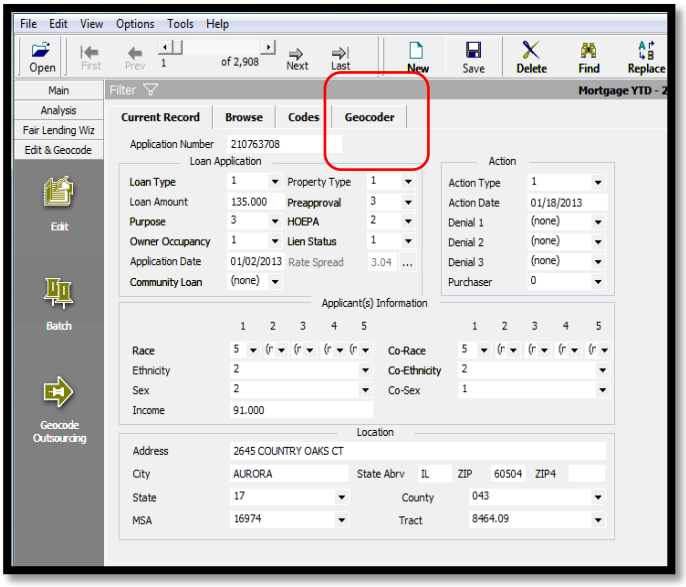
The interactive screen includes the following fields and buttons:



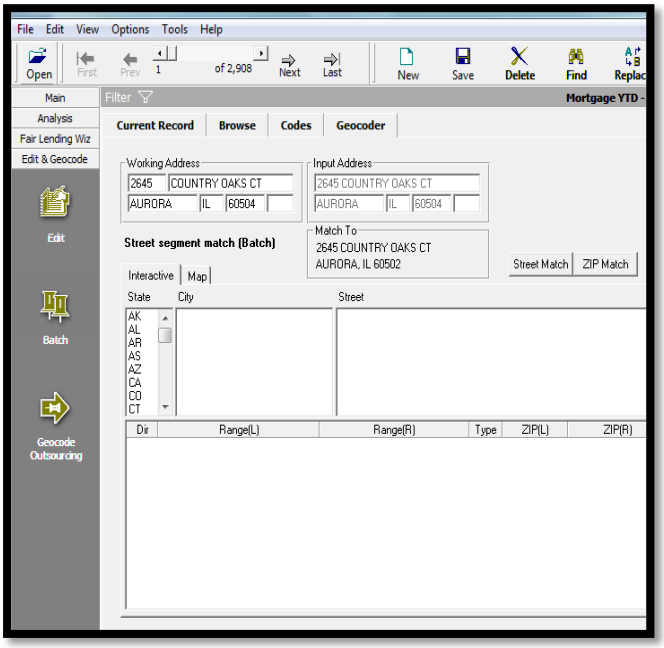
1. **Next** button – click the Next button to display the next ungeocoded record
2. **Working Address** - update the address (number, street, city, state and ZIP code)
3. **Current geocode status** - describes the current status of the record
4. **State** - automatically selected when you display a loan record
5. **City** - automatically displays when you display a loan record
6. **Street** - use this list to determine the correct spelling of an incorrectly spelled street
7. **Address ranges/Zip Codes** - all available address ranges for the street you select
8. **Street Match/Zip Match** button - the button you click depends on the address information you change in the Working Address field

To access interactive geocoding functionality from the **Edit** screen, follow these steps:

1. Click the **Geocoder** Tab



The software displays the **Interactive Geocoder** screen.



Working with the Interactive Geocoder

The test institution's standing process is to interactively geocode, to the street match level, all records that did not geocode during batch geocoding.

We noted on the **Geocode Exception** report that one record in particular (application number 20096155) did not geocode. The street name entered for this loan record (CHGO) did not match any street names in the address database. Because the majority of records in the LAR are located in Illinois, we can assume that CHGO is an abbreviation of Chicago.

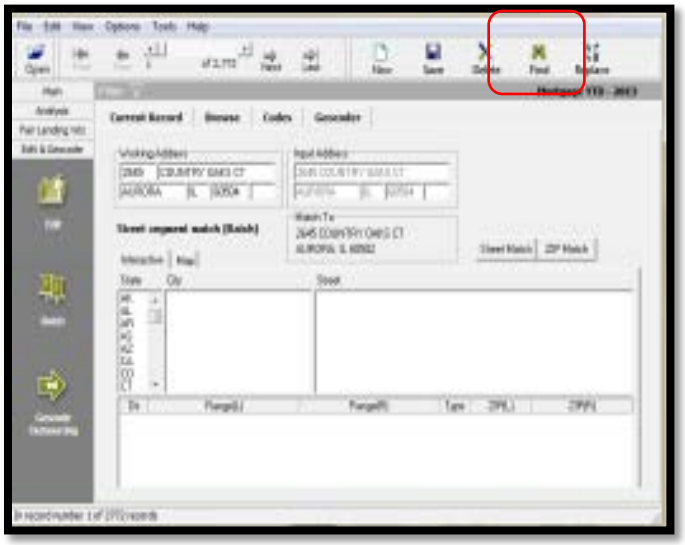
To update the address and geocode the record, use the following procedures:

Find the Record
Correct Spelling

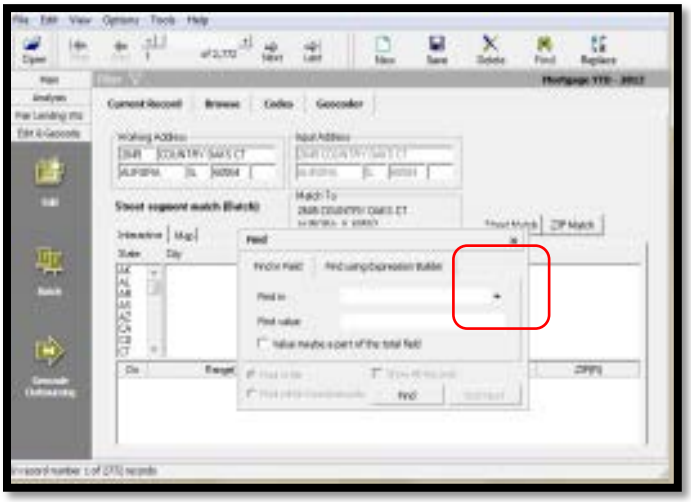
Find the Record

To find the record, follow these steps:

1. On the **Interactive** screen, click the **Find** button

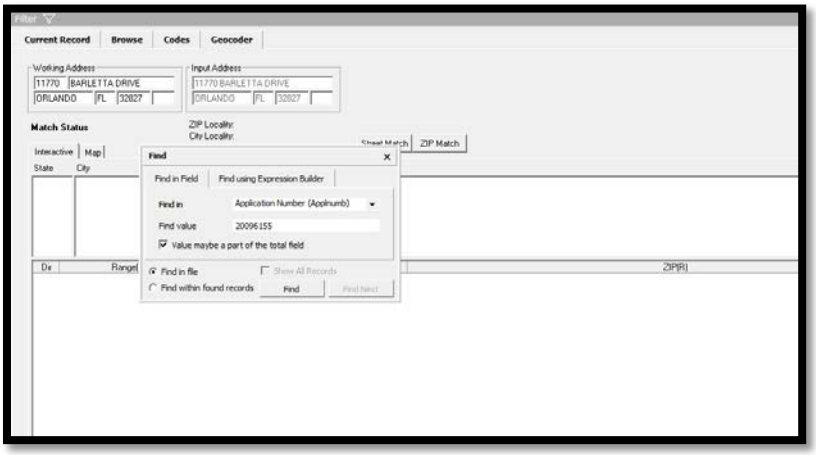


2. Click the **Find in** field drop down



3. Select **Application Number (Applnumb)**

4. In the **Find value** field, enter **20096155** and click the **Find** button

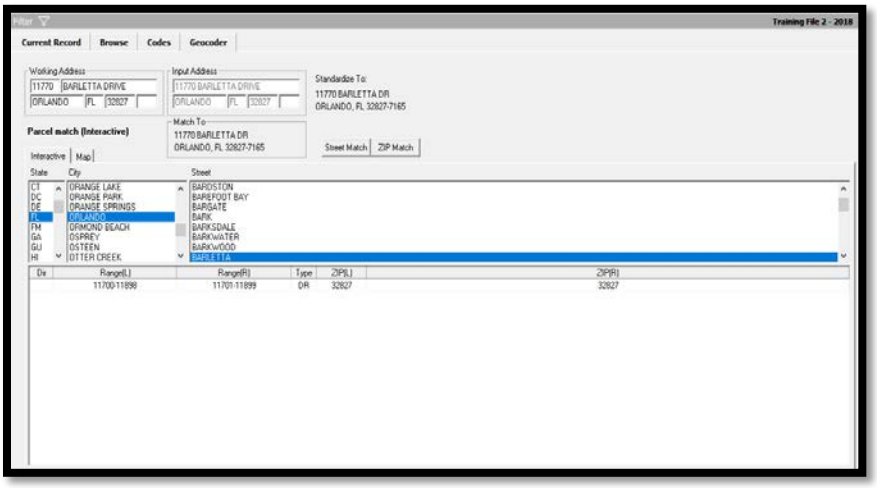


The software begins to search for the record.

The file is filtered to display only the record you are searching for. To turn off the filter, select "Show All Records" from the Tools menu.

The software displays application number 20096155. To interactively geocode this record, follow these steps:

5. Select State **FL**
6. Select City **Orlando**
7. Click in the top of the **Street** list

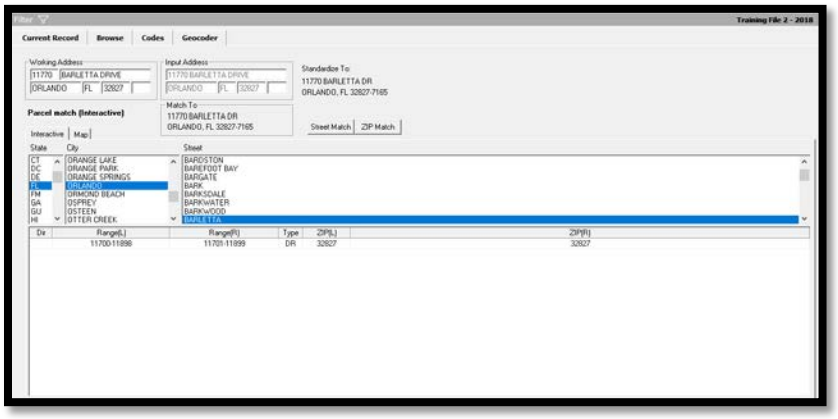


The software highlights the first row in blue.

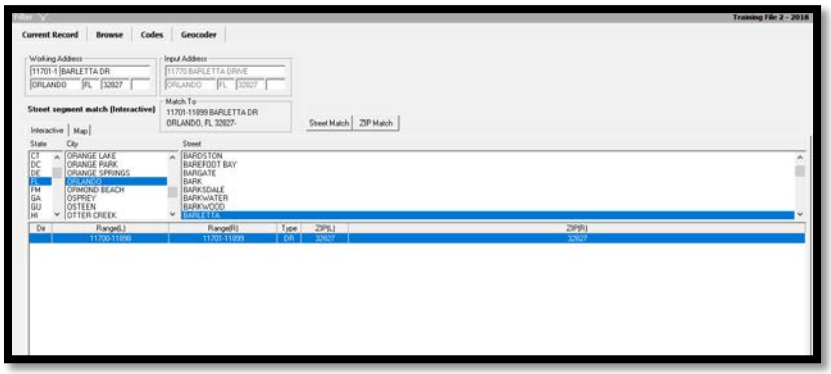
8. Type **B A R L,** the first few letters of Barletta, the street to search for

The software displays and highlights **Barletta** in the **Street** field.

9. To confirm that the address number **11770** is valid, use the scroll bar to search for the address range in which the address **11770** falls



10. Double click the address range



The software geocodes the record and displays **Street Segment Match (Interactive)** as the new geocode status message.

The last step is to permanently change the record's address, which will be completed during the next exercise.

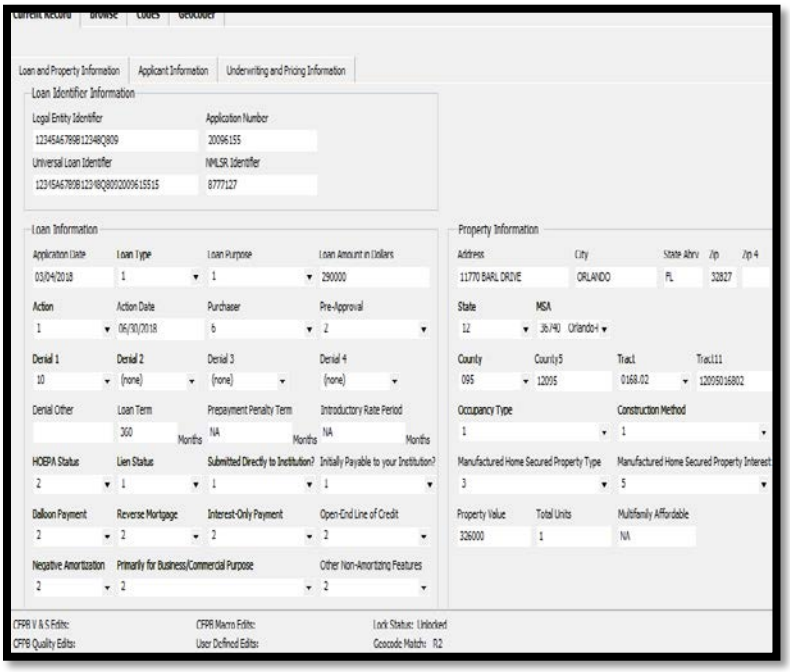
Geocoding Individual Loan Records

Overview: The Geocode button in the Edit screen can be used to geocode a single loan record without utilizing the Batch Geocode function. This functionality can be accessed by selecting the record that needs to be geocoded and clicking the Geocode button located on the toolbar. The Geocoder button will use the same settings that have been set for the batch process.

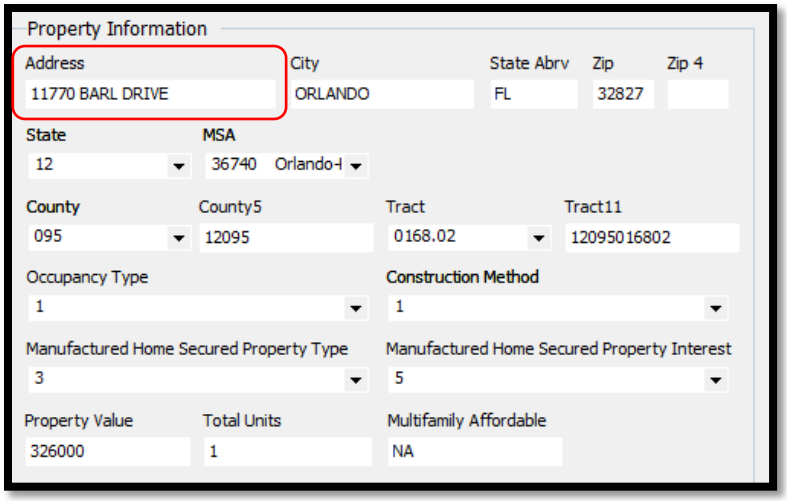
In the previous exercise we interactively geocoded application number 20096155. CRA *Wiz* automatically corrected the working address on the Geocoder tab, however the input address located on the Current Record tab is still incorrect. We will correct and permanently change the input address and then use the Geocode button to geocode the address.

To correct the input address and use the Geocode button, follow these steps:

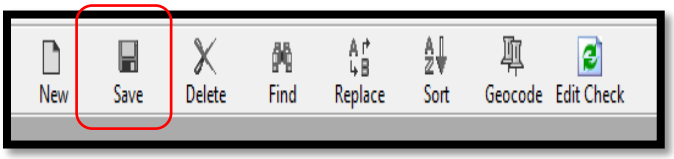
1. Click on the **Current Record** tab



2. Click in the **Address** field holding the left mouse button down and highlight the word **BARL** and type the word **BARLETTA**



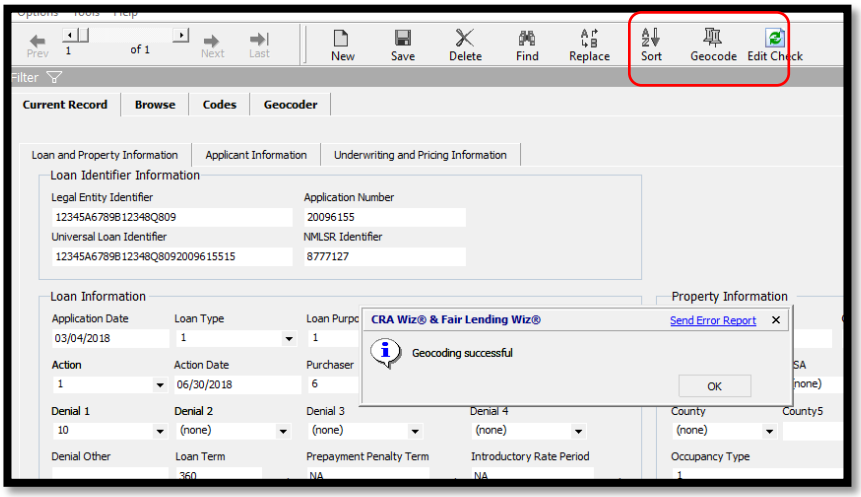
3. Click the **Save** button located on the toolbar



Once the record is saved, CRA *Wiz* clears the values that were in the MSA, State, County, and Census Tract field because a change was made to the address

4. Click the Geocode button to geocode the address

5. Click the **OK** button in the geocode confirmation dialog box



The record is now geocoded.

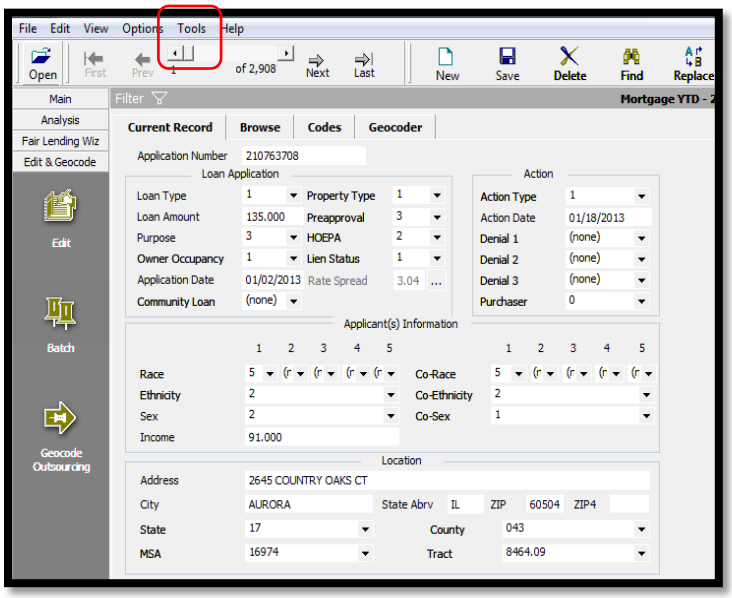
Working with the Geocode an Address Function

The Wolters Kluwer Single Record Geocoder function gives users the ability to geocode a single address.

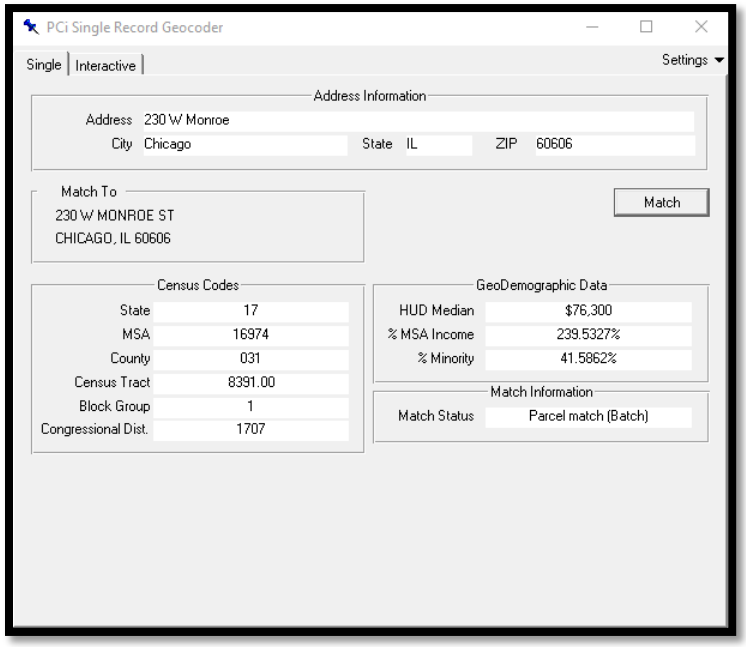
Exercise: You have recently been asked for the census tract of a particular address the marketing department is researching, for the purpose of opening a new branch. The address is 230 W Monroe, Chicago, IL, 60606.

To geocode an address with the Wolters Kluwer Single Record Geocoder, follow these steps:

1. Click the **Tools** menu and select **Geocode an Address**



2. Enter the following information:
   a. Address: 230 W Monroe
   b. City: Chicago
   c. State: IL
   d. Zip: 60606
3. Click the **Match** button



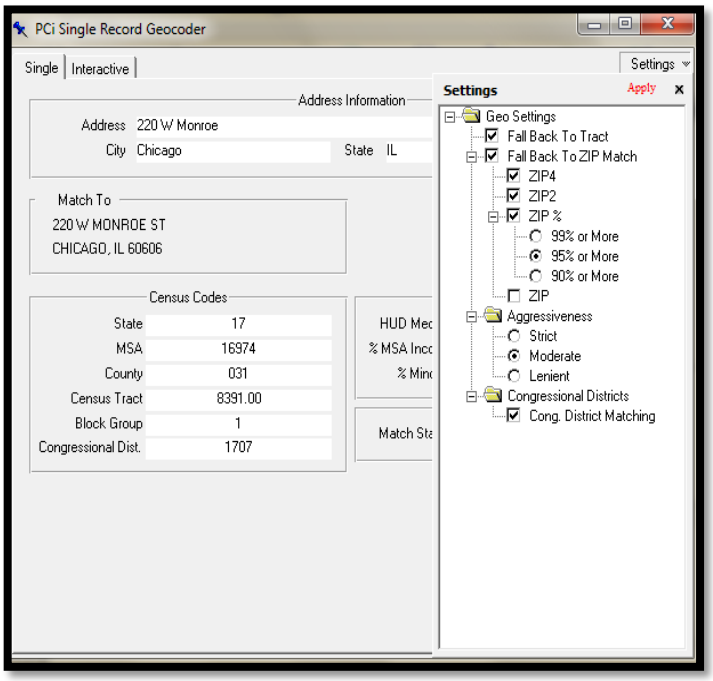
The record is now geocoded.

Information obtained through this method is not retained in any file.

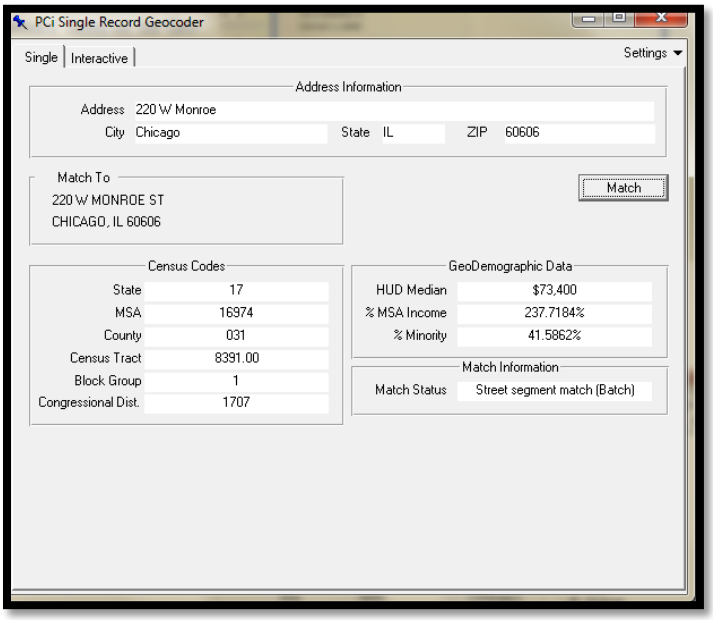
To review the current Geocode Settings, follow these steps:

4. Click the settings drop down

The software displays the Settings window.



5. Click the **X** button to close the Single Record Geocoder



Digitizing an Address

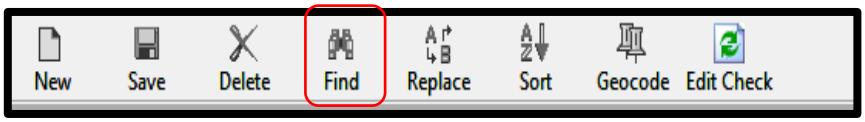
There will be times when the Geocoder is not able to geocode an address. Reasons may vary, but the most common reason is because the street is new and the new address is not in the address database. Also, some small rural communities are not yet included in the database. In these instances, the user may want to seek additional information to be able to pinpoint the property on a map.

Exercise: We determined that CRA *Wiz* could not geocode an address on Blanchard Creek Rd because the address is not found in the address database. Using information gained from the file, it is discovered that this property new construction and it was discovered that there are three streets bordering the area where the houses on Blanchard Creek Rd are being built:

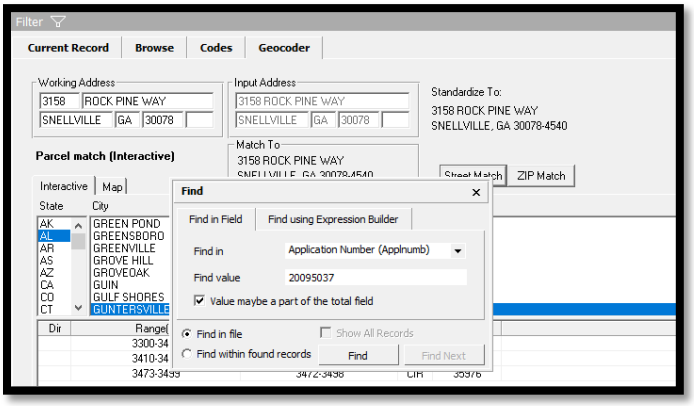
- North of Patterson Street 1431-1913 1430-1912
- South of Seibold Street 1601-1817 1600-1818
- East of Skyline Drive 901-999 900-998

To use the digitize tool to interactively geocode the record based on the information learned above, follow these steps:

1. Click on the **Find** button in the tool bar

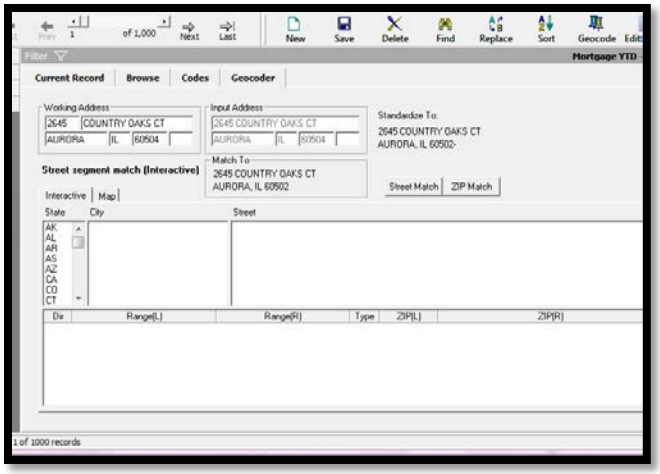


2. Type Application Number **20095037** in the Find In field and click the **Find** button



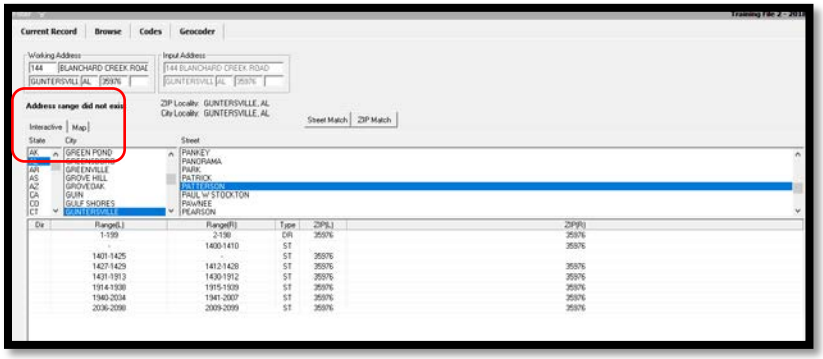
The software finds the record and provides the information it knows to be true, such as state and city. When you click on a city/town all the streets found within that area will be listed.

3. Scroll down to locate Patterson (one of Blanchard Creek's adjacent streets) from the street list

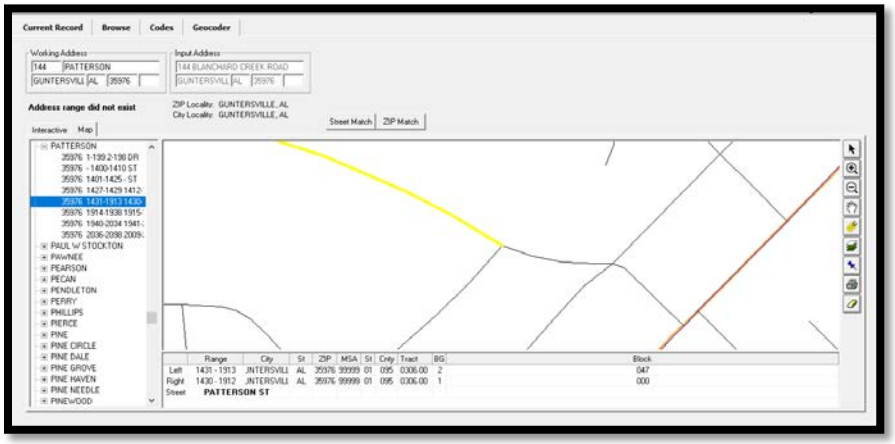


4. Click on Patterson

5. Click the **Map** tab



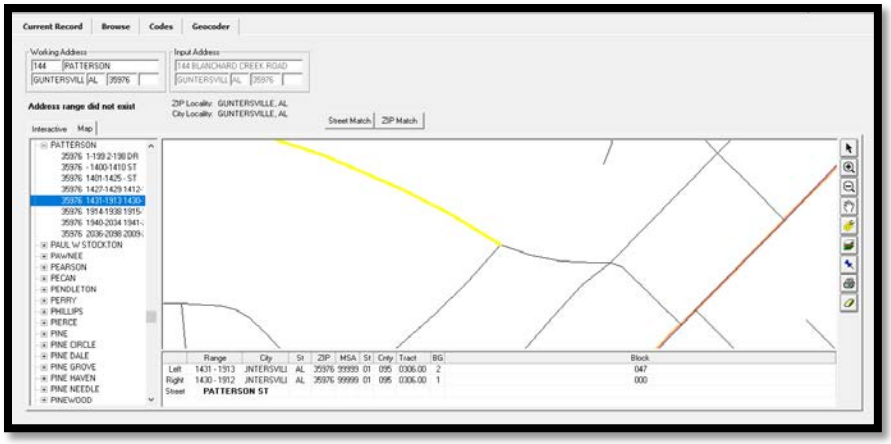
6. Double click on the street segment **Patterson 1431-1913 1430-1912**



The software displays the street segment highlighted in yellow on the Map and census tract information in the grid below the map.

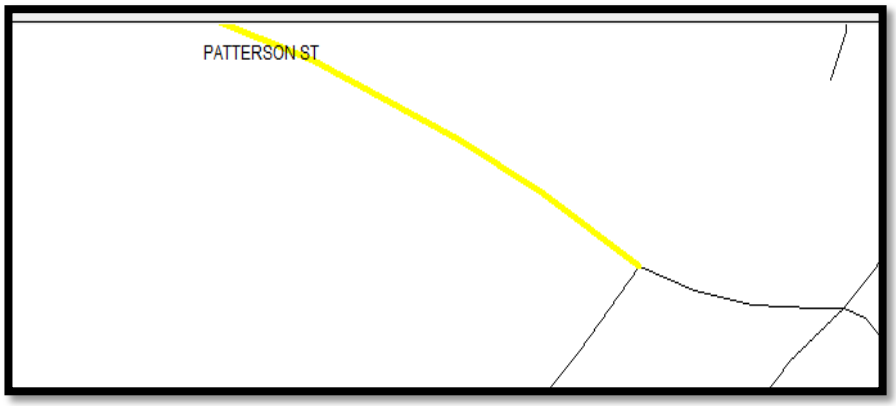
The census tract of the Patterson street segment is: **0306.00**

7. Click the **Label Street** tool

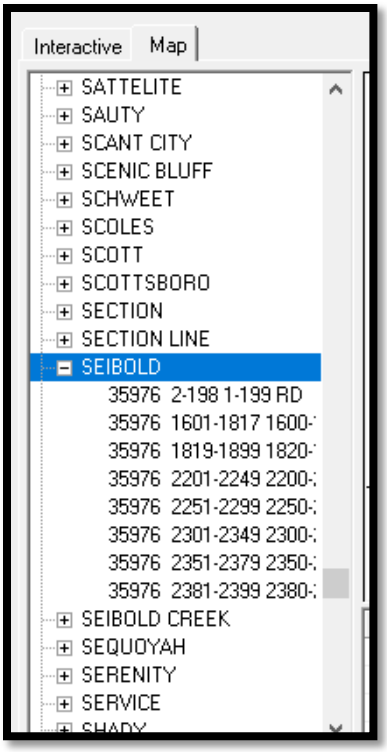


8. Click the **yellow street segment**

Patterson Street is now labeled on the map.



9. Use the **scroll bar** to locate **Seibold** from the street list



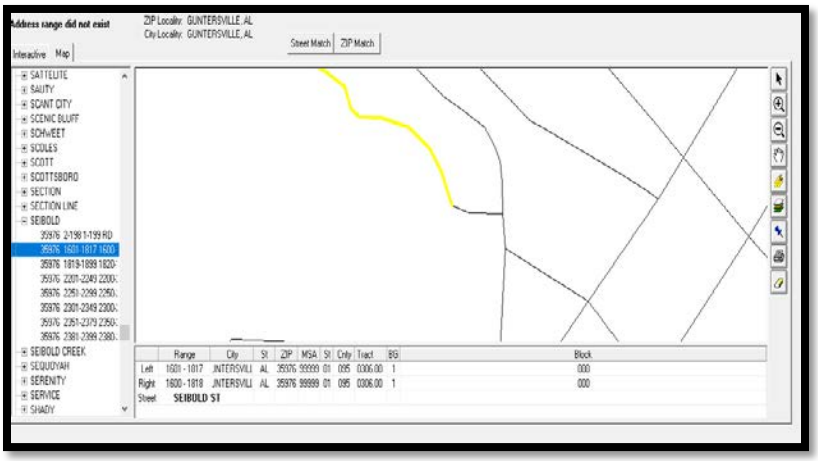
10. Double click the **+ sign** next to Seibold

The software displays the street segments for Seibold

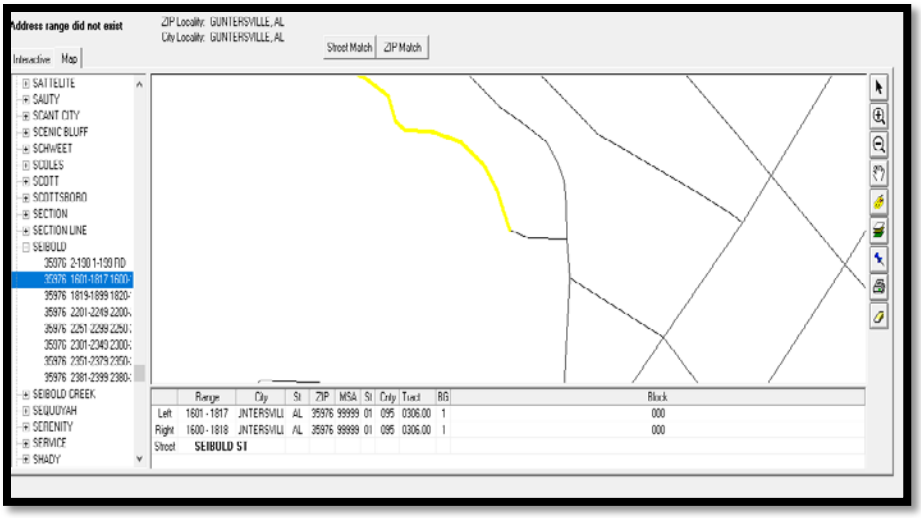
11. Double click the street segment Seibold 1601-1817 1600-1818

The software displays the street segment highlighted in yellow on the Map and census tract information in the grid below the map.

The census tract of the Seibold street segment is: 0306.00

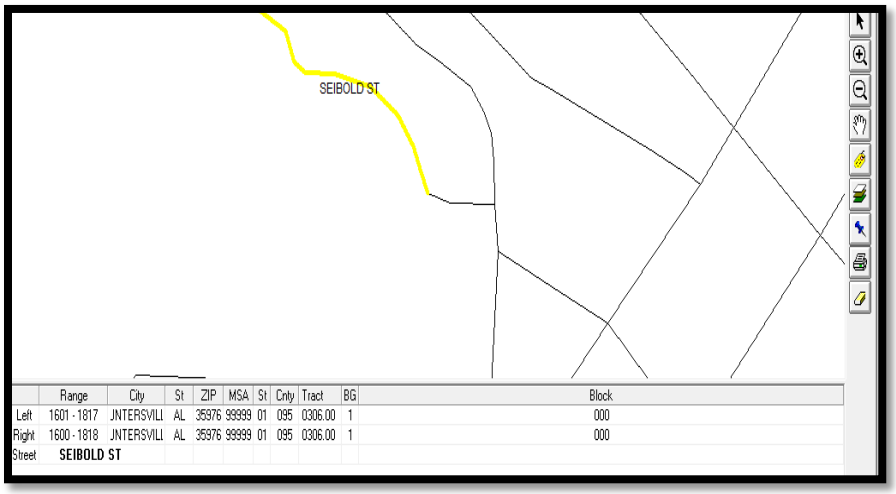


12. Click the **Street Label** tool

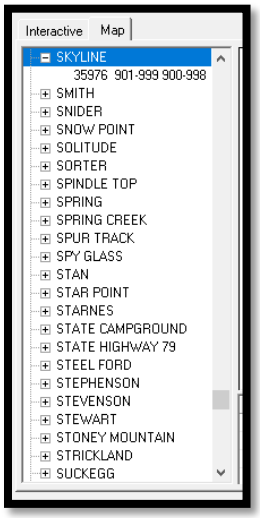


13. Click the **Seibold** yellow street segment

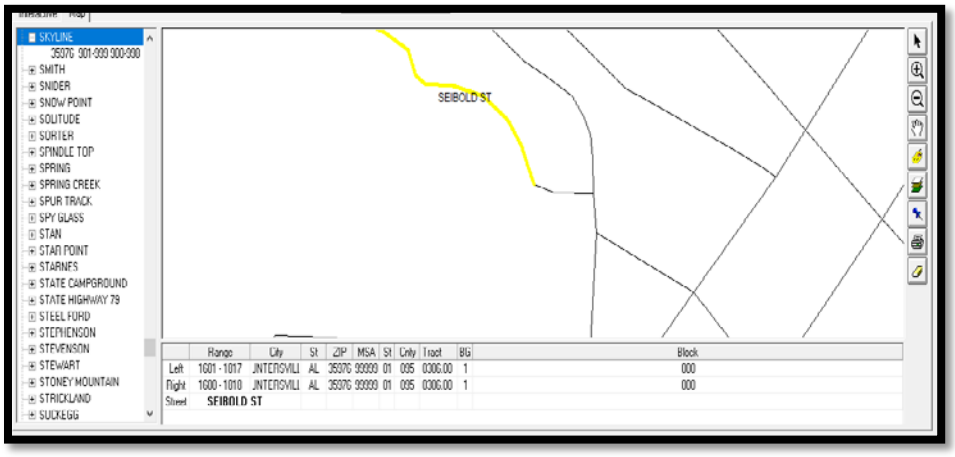
Seibold is now labeled.



Use the scroll bars to locate **Skyline** from the street list.



14. Double click the **+ sign** next to Skyline



The software displays the street segments for Skyline Dr.

15. Double click the street segment Skyline 901-999 900-998

The software displays the street segment highlighted in yellow on the Map and census tract information in the grid below the map

The census tract of the Skyline street segment is: 0306.00

16. Click the **Street Label** tool

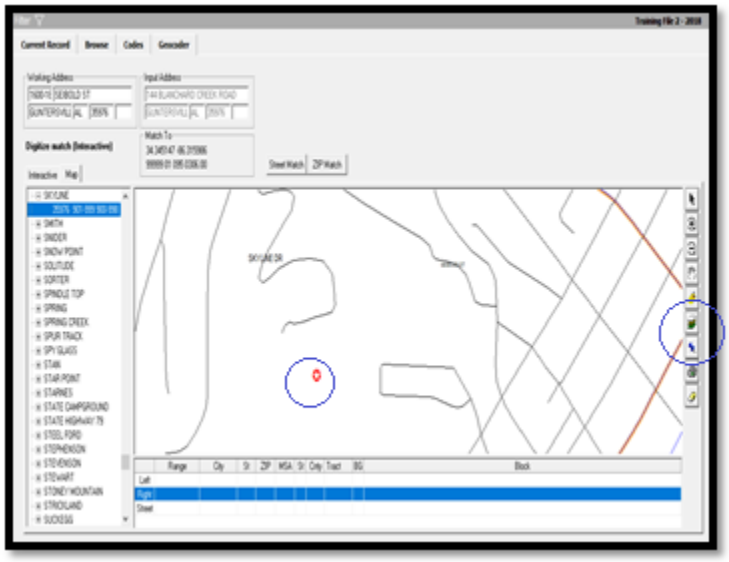
17. Click the **Skyline** street segment. The software labels the street segment **Skyline Dr**

With all the surrounding streets located and labeled on the map, you can now digitize the location of Blanchard Creek Rd. You also know that all street segments surrounding Blanchard Creek Rd fall within the same census tract **0306.00.**

You will digitize the address directly in the center of all the surrounding streets.

To digitize the Blanchard Creek address, follow these steps:

18. Click the **Digitize** tool
19. Click in the center of the surrounding three streets



The software does the following:

- Geocodes the Blanchard Creek address to a Longitude and Latitude
- Changes the Geocode status message to: Digitize match (interactive)

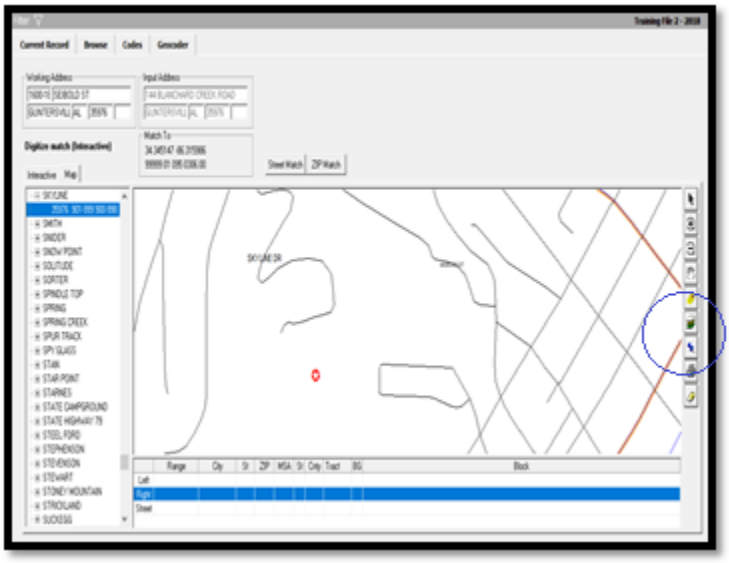
An orange line on the map represents a census tract.

Adding a Tract Layer to a Map

To ensure that all surrounding street segments truly exist within the same census tract (0306.00), you can add a Tract layer to the Map.

To add a Tract layer to the map, follow these steps:

1. Click the **Layer Control** button

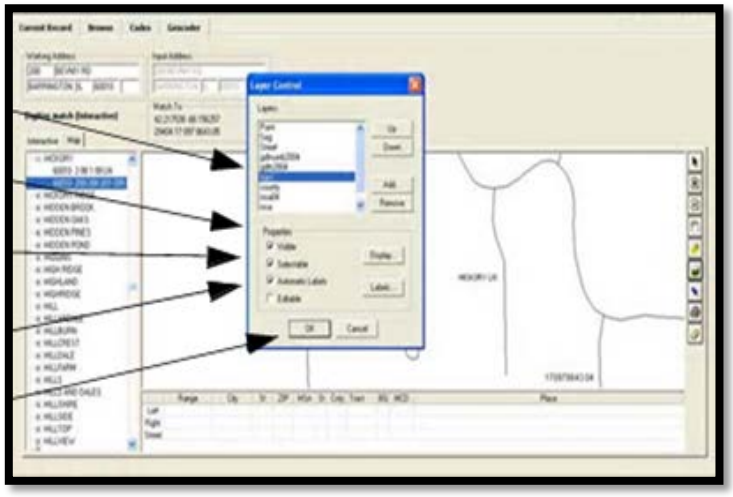


The software displays the available layers.

Select the following:

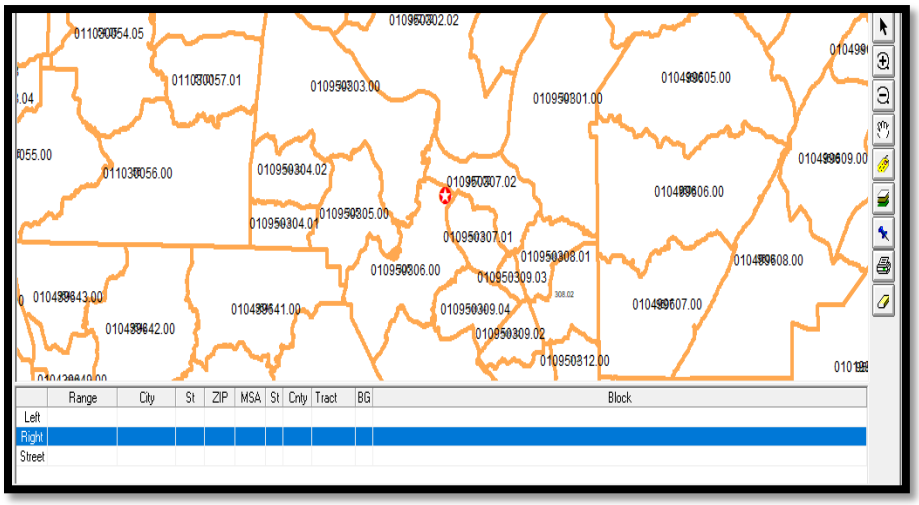
- Tract
- Visible
- Selectable
- Automatic Labels

2. Click **OK**



3. Click the on the **Zoom Out** button and click four times in the center of the map

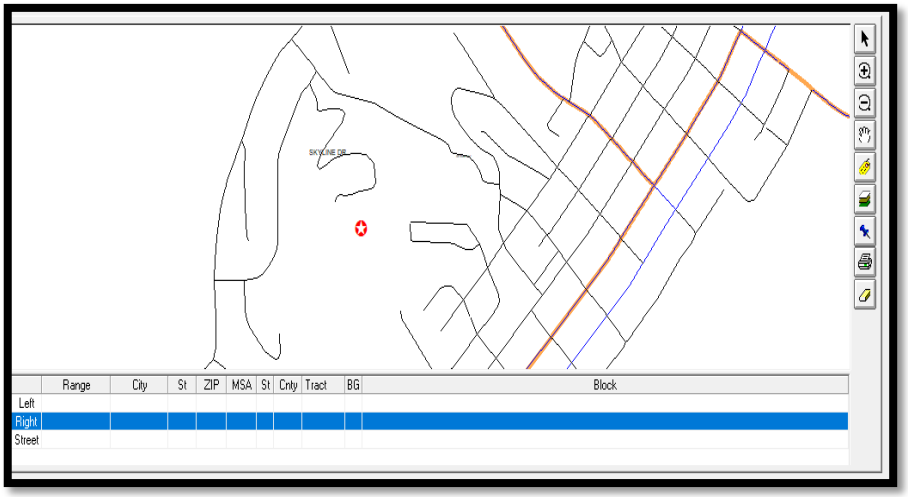
The software now displays the census tracts boundaries and the FIPS code on the map.



Printing a Digitized Map

To print the digitized map, follow these steps:

1. Click the **Print** button

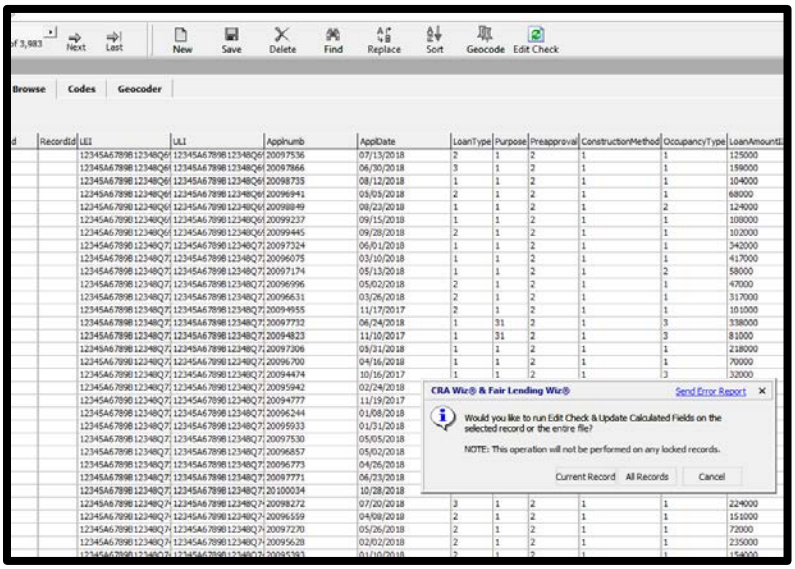


The software will print the map.

Updating Calculated Fields for Geocoding

Due to HMDA DF changes, the census tract and county codes now report in a different format. For CRA *Wiz* to update the information, you must Update Calculated Fields.

1. To update calculated fields
   a. Click Browse
   b. Click Edit Check
   c. Click All Records



The system will update calculated fields.

2. Click **OK** when finished

Chapter 5 - File Management

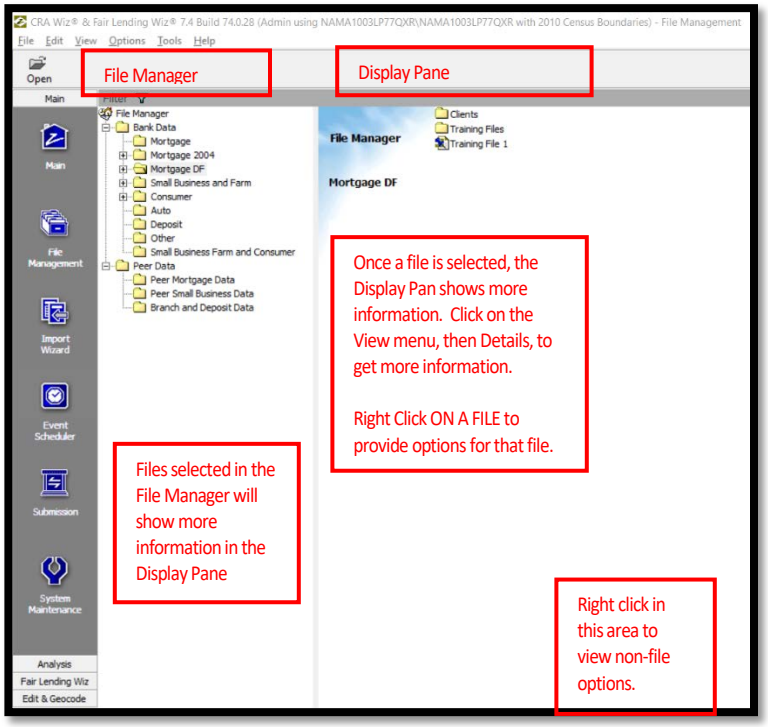
File Management is the module within CRA *Wiz* where users may perform necessary file related functions. Within File Management, users can back up loan data files, copy a LAR, append one file to another, and export a file out of CRA *Wiz*. Performing Edit Checks and Update Calculated fields will help to ensure the integrity and quality of the data within the file. Users can also set a file as the current file, rename a file, and modify the structure of the file.

Understanding File Management

You use the **LAR Manager** screen to manage your *Wiz* files.

The LAR Manager screen includes the following.

- **File Manager** - Use the File Manager tree view to select the folders you want to display in the display pane
- **Display Pane** - Use the Display Pane to display the contents of a folder you select in the tree view
- **View Menu** - Click on View > Details to show other information, such as date last modified and whether the file is geocodable (also indicated by the blue pushpin)



Functions in File Management (right-click on file)

FUNCTION	COMMENTS
Set as Current File	Changes the file selected to the "Current File" (the utilized file)
Properties	Database name, creation date, record count
Browse	Opens file for viewing, but no edits allowed
Edit	Use instead of Edit & Geocode > Edit
Audit LAR	Available to those paying for the Audit features
Rename	Rename a file
Delete	Delete any file - as long as it isn't the "Current" file
Cut	Cut from a folder, Paste into a different folder
Copy	Make a Copy of a file, then "Paste" into same or different folder
Copy Codes Table	Copy the Modify Codes results between 2 files
Append to File	Appends 100% of records from one file to another
Copy with Filter	Performs a copy but applies a filter to the results
Update One File to Another	Takes contents from one file and "Updates" another file
Create Sample File	Creates a sample size the user selects or uses precision and reliability levels to produce a sample
Change File Type	Change from one Wiz file type to another
Run Edit Checks >	Runs the Edit Check routines after changes are made
Update Calculated Fields	Updates all Calculated Fields (rate spread, demographic information fields, etc.)
Update County Codes	Used to update the Alaska counties that changed in 2010/2011 and the Alaska and Virginia counties that changed in 2015
Modify ZIP Codes for RPO	Uses a database to change Zip codes for Rural Post Office addresses
Impute Gender Based on First Name >	Uses FirstName to proxy Gender
Impute Ethnicity Based on Last Name >	Uses LastName to proxy Ethnicity
Impute Race Based on >	Uses LastName to proxy Race
Impute BISG Race Based on >	Uses a combination of LastName and Address to produce a combined probability of being a particular race or ethnicity
Unlocate File	USE WITH CAUTION! Removes a file from the File Management listing (the user must know the Database name before doing this)
Transfer/Backup	Creates an encrypted file that is smaller in size and puts it into a chosen folder (outside the Wiz tool)
Modify Structure	Allows for addition, deletion or modification of fields in a file
Export File	A user can export a file by selecting the file type, location, and fields, and records to be exported. Export formats can be saved for future use

Functions in File Management (NOT on a file)

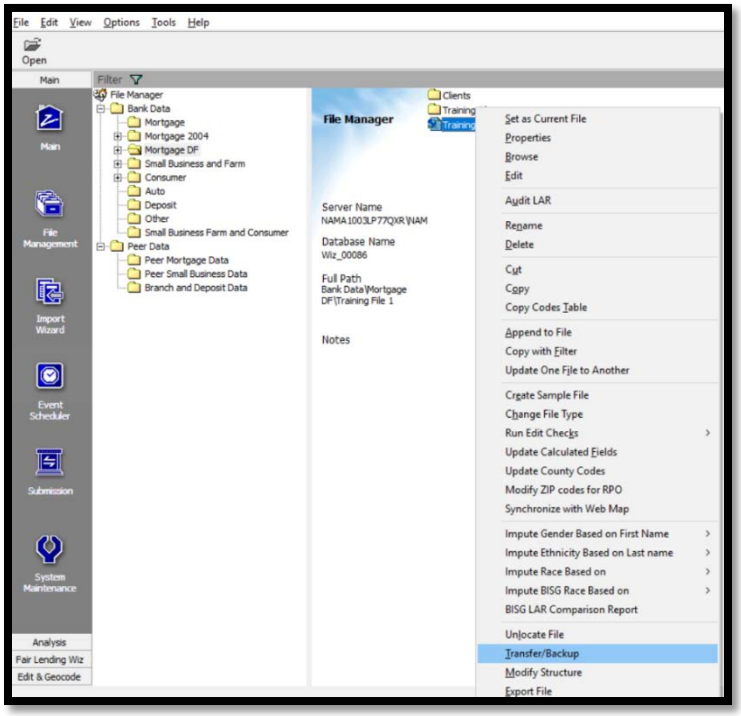
FUNCTION	COMMENTS
New File	Allows a new file to be created.
New Folder	Allows for a new folder to be created. Automatically places the folder within the sub-folder showing in the left panel
Paste	Allows a copied file to be placed or “pasted” in the folder selected
Copy with Filter	Performs a copy but applies a filter to the results. It prompts for both the source and target files
Update One File to Another	Takes contents from one file and "Updates" another file. It prompts for both the source and target files
Locate File	Allows for "Unlocated Files" to be relocated so long as the user knows the database name "Wiz_000xxx". The user will select the database name and the file will appear in the list of files
Install/Restore	If a file was "Transferred" using Transfer/Backup, use this option to locate the file and bring it back to a location of choice.
View >	Changes the file listing from the default (list), to Large Icons, Small Icons, or Details (which provides the last modification date and whether the file is Geocodable)
Arrange Icons >	Arranges the file listing in Name, Geocodable, or Modification Date

Transfer \ Backup a File

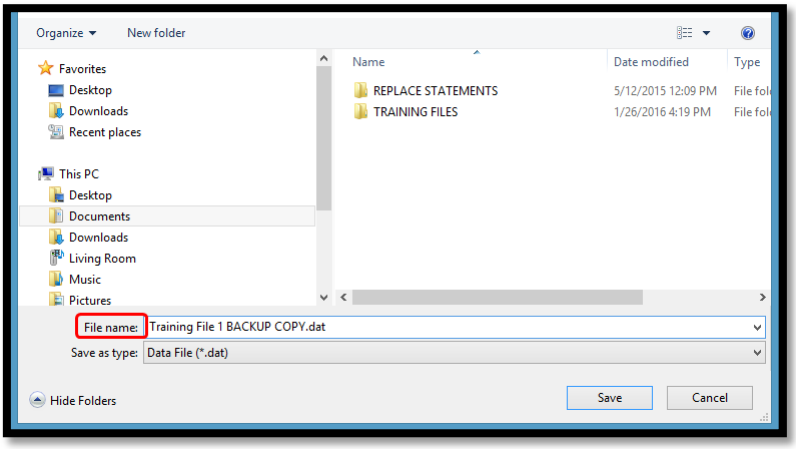
The Transfer function is a utility that places an encrypted, compressed copy of the selected file in any location the user chooses. Once the file has been transferred, a user can retrieve it by using the Install function.

To backup/transfer a file, follow these steps:

1. Right-click on **Training File 1** file
2. Select **Transfer/Backup** from the menu



3. **Navigate** to the folder where you would like the file to be stored, **provide a name** and click the **Save** button



Transfer/Back up allows the user to create and save a copy of the file in a location other than CRA *Wiz*.

Copy/Paste a LAR

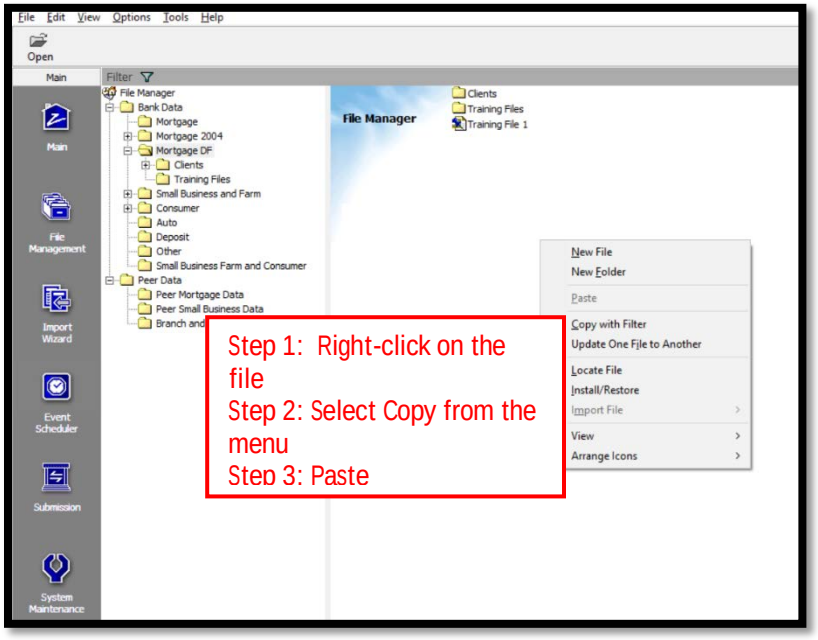
Wolters Kluwer strongly recommends all users make a copy of a file before any modifications are made to the file.

There are two different methods for copying files:

- **Copy** (including **Copy with Filter**) - copies the file within CRA *Wiz*
- **Transfer/Backup** - creates a copy of the file in any location the users chooses. If the original file is damaged, you would delete the damaged file, and use the **Install/Restore** function to recreate and restore the file to its original condition

To copy a file, follow these steps:

1. Right click on the file you wish to copy
2. The contextual menu will appear. Select **Copy**
3. Right click in the open area (not on a file)
4. Select **Paste** from the contextual menu

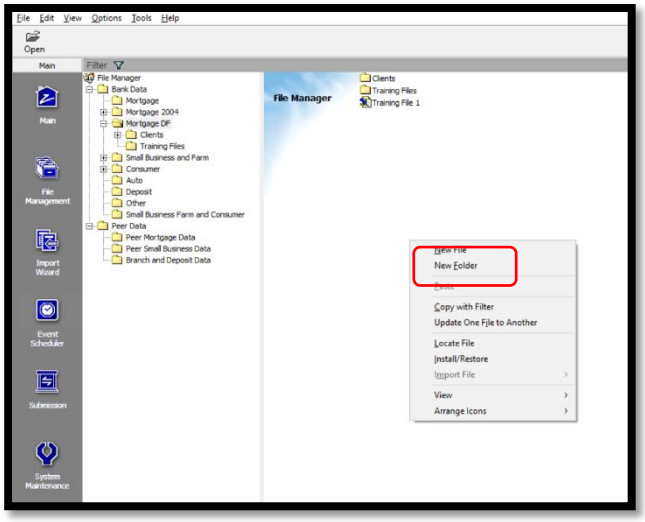


The software names the new file to the file name with **"(001)" at the end** and places the copy in the folder.

By pasting the copy in the same location as the original, a numeric value is added to the file name. (001) represents the first copy. The software makes a duplicate of the file.

Create New Folder

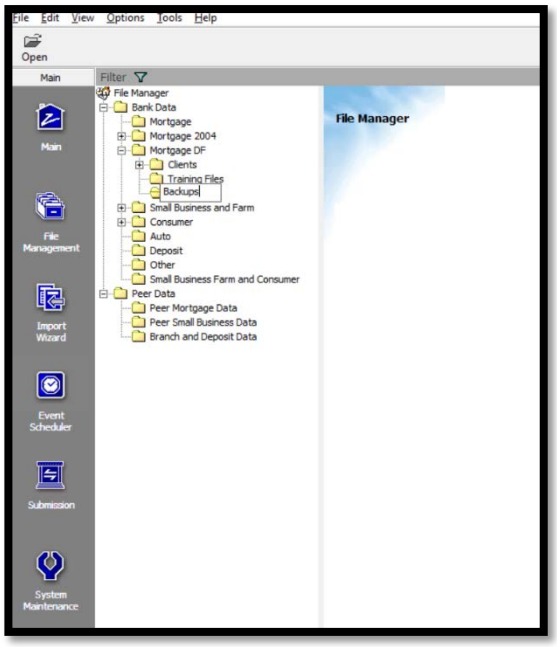
1. Right click anywhere in the display pane



2. Select **New Folder** from the contextual menu

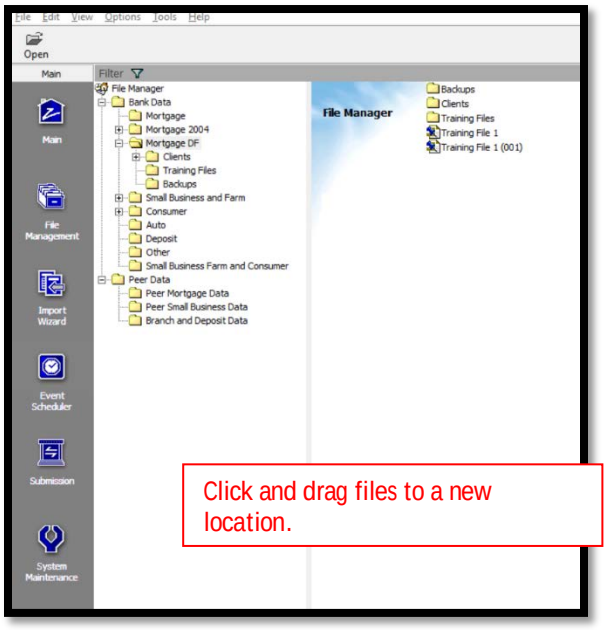
The software creates a subfolder under the file type.

3. Rename the New Folder **Backups**



Relocate a File

1. Left click on the file you wish to relocate and **drag** the file into the Backups folder

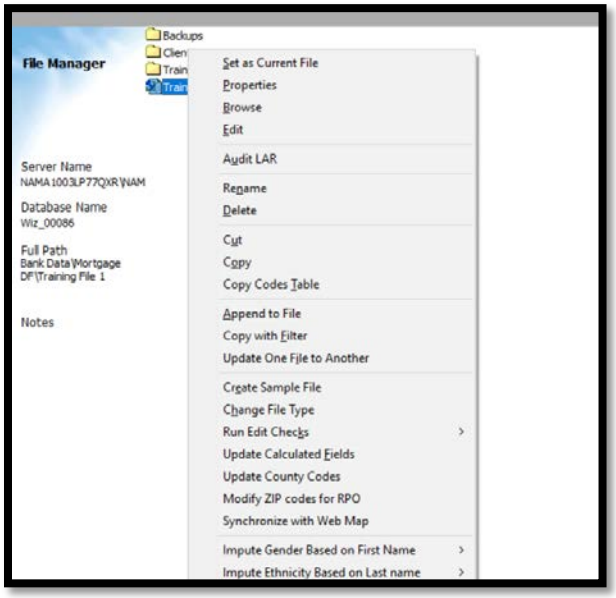


Copy with Filter

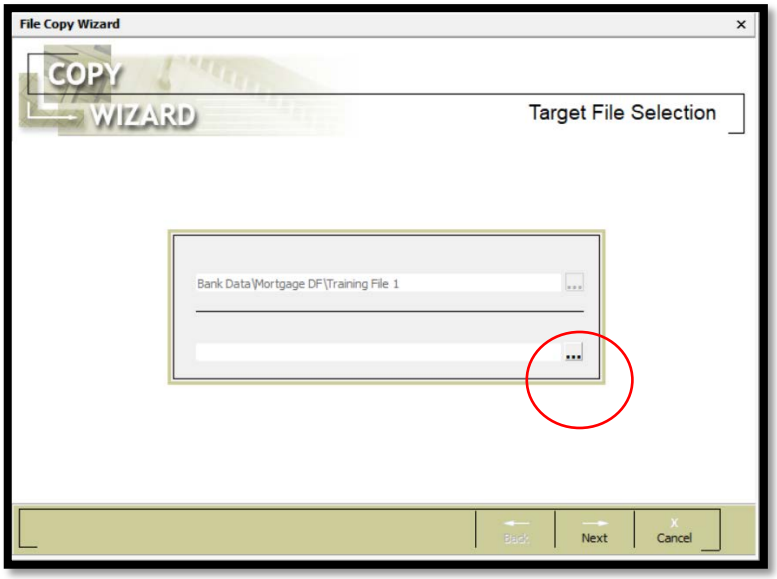
Copy with filter can be a useful method for creating a new file with fewer records – records that are specific to what the user needs to analyze. For example, for a fair lending pricing analysis a new file could be created containing only originated (funded) loans. The most likely reason to do this would be to reduce the number of records by removing all other actions.

Copy with filter can also be used on Peer Mortgage Data, copying applications from specific lenders that the institution compares itself against.

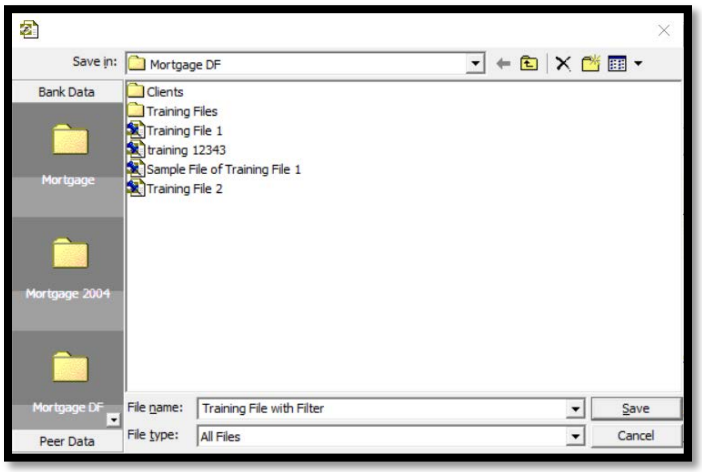
1. To create a file with originated loans only:
   a. Right-click on **Training File 1**
   b. Select **Copy with Filter** from the menu



2. The Source File and Path is already selected. Click the **Ellipsis** to set the new file's directory and provide a name

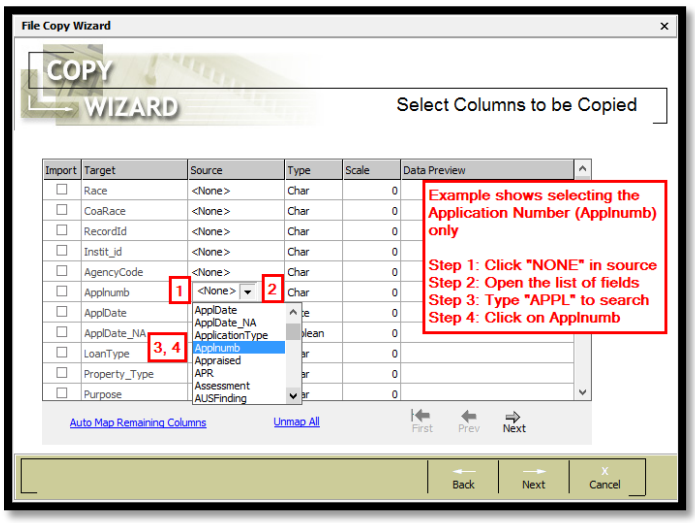


3. **Navigate to the folder** where the copied file to go
4. Provide a File Name
5. Click the **Save** button
6. Click **NEXT**

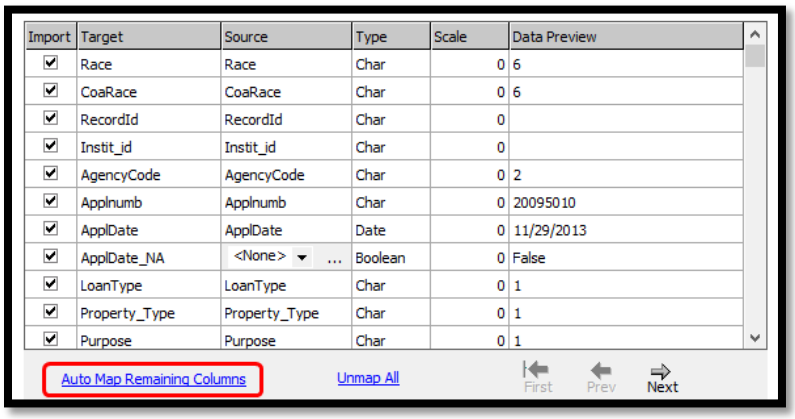


The next step is to select the columns to be copied. Most of the time all columns will be selected, but you can choose to select any column(s) you want in the copied file.

1. For this example, only a certain column will be selected, such as APPLNUMB
   a. In the Source column next to the Target name of the field you would like to select, click **<None>**
   b. Click the **down arrow** to open the drop-down list
   c. **Type as much the file name as needed** to see it in the list
   d. Click the matching field

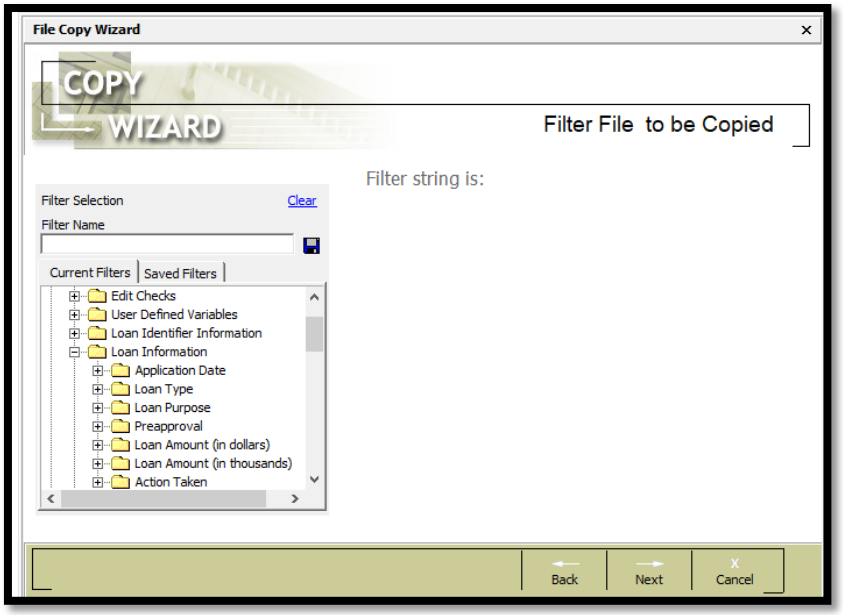


2. To select all columns, click the blue link **Auto Map Remaining Columns**
3. Click **NEXT**



The "Filter File to be Copied" screen is next. Here, a user can copy any column, multiple columns, combinations of required fields and User-Defined Fields.

1. Open the **Loan Information** folder (by clicking the + sign or double-clicking anywhere in the name of the folder)
2. Open **Loan Information**
3. Open **Action Taken**
4. Select **Loan Originated**
5. Click **Next**



The "Thank You" screen contains a summary of the actions you are about to take, which also includes the filtering information.

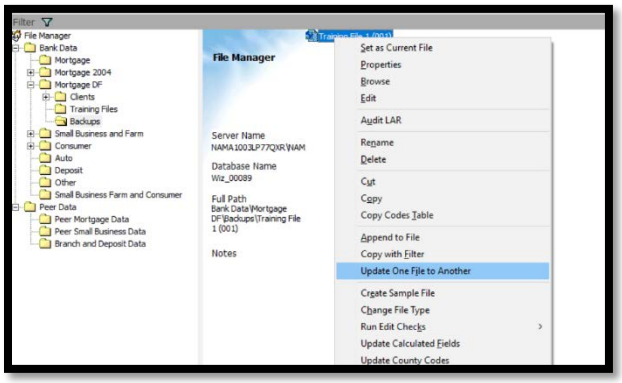
6. Review the information to ensure it looks correct. If so, click the **Finish** button, if not click the **Back** button and correct the incorrect information

Update One File to Another

In the Import chapter, users learned how to "Update" an existing file with information from a new source. In the same manner, users can use an existing file to "Update" another file.

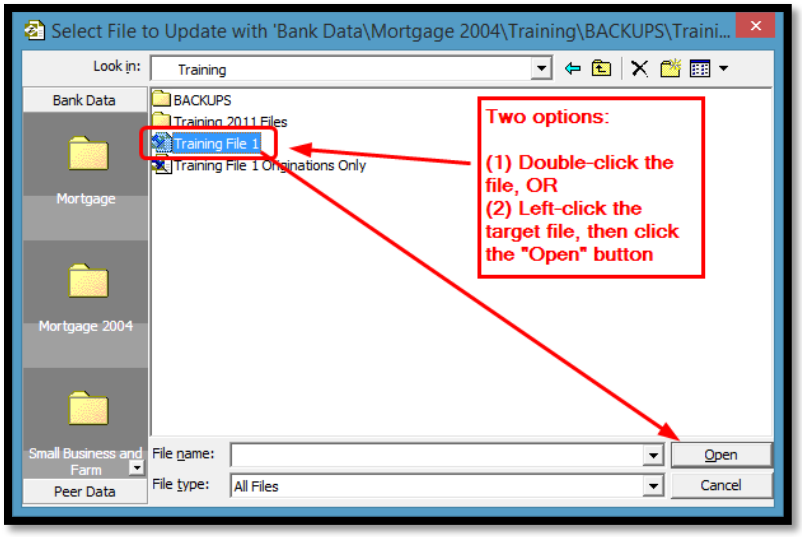
The fields must be the **same name and same format** in both files (both files must contain the field Cust_Credt, for example, and both must be Integer fields)

1. To update a field from one file to another:
   a. Navigate to the folder location of the file you wish to update the Target file with. In this example, the BACKUPS folder
   b. Right-click on the file
   c. Select **Update One File to Another**



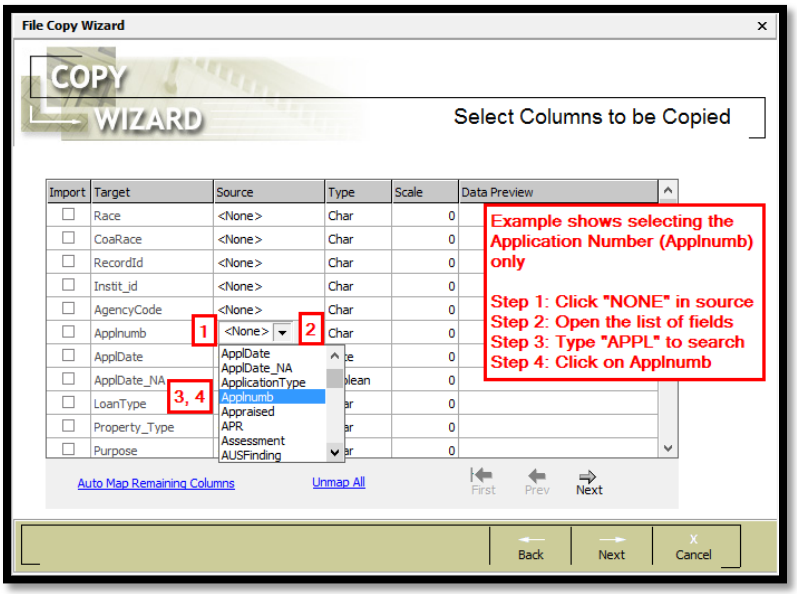
   d. On the Select File or Update screen, click the **Ellipsis**

   e. Select the file as the target by double-clicking on it, or single-click, then click Open

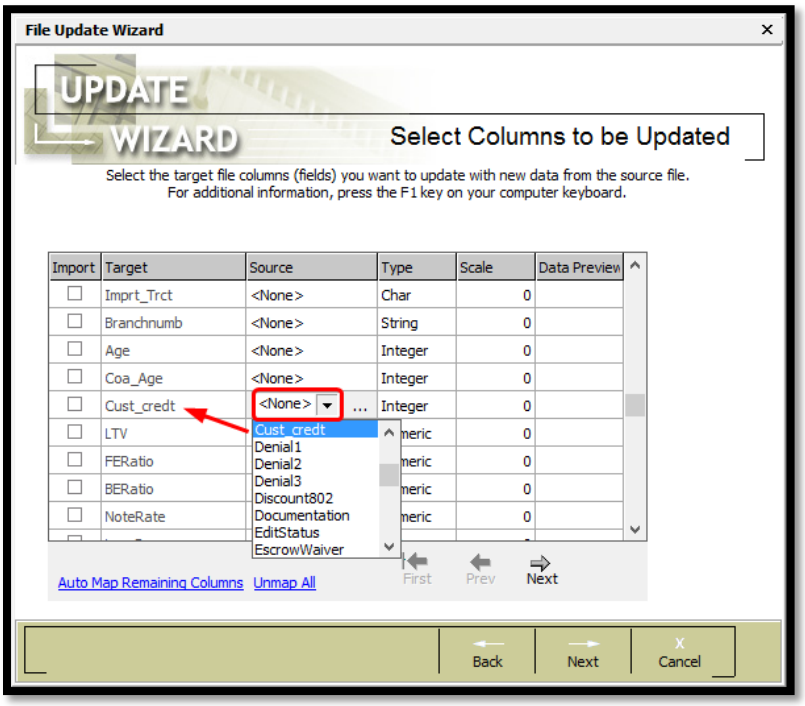


To perform an update on a file, the "Key" field must be included in both and selected. The key field drives the update process by selecting the appropriate record to update, then applying your changes to that record.

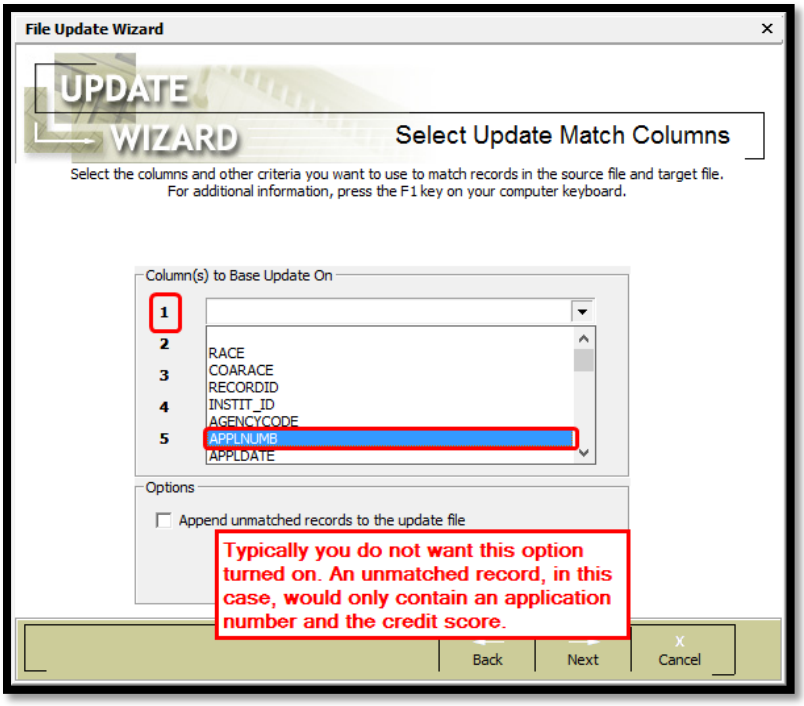
1. For this example, only a certain column will be selected, such as APPLNUMB
   a. In the Source column next to the Target name of the field you would like to select, click **<None>**
   b. Click the **down arrow** to open the drop-down list
   c. **Type as much the file name as needed** to see it in the list
   d. Click the matching field



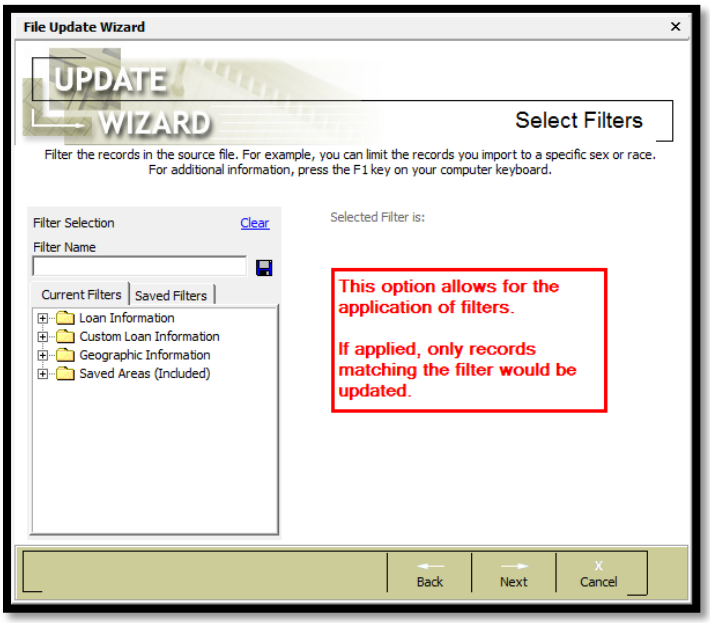
2. **Then add the next field that needs to be updated. To do so, scroll down** through the list of fields until you reach the field, such as Cust_Credt
   a. In the Source column, click on **<None>**
   b. Type **Cust_Credt** until it appears in the list
   c. Select **Cust_Credt** from source
3. Click **NEXT**



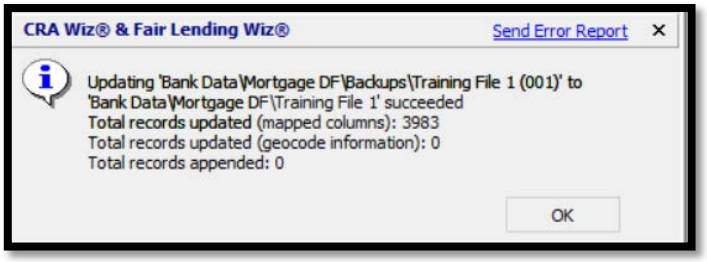
2. In the Select Update Match Columns, Column 1, select the “key” field that will be the match factor. In this example, Application Number or **APPLNUMB**



3. No filters are being applied at this time, but filters could be applied
4. Click **NEXT**
5. The next screen is the FINISH THE UPDATE screen. Click the **Finish** button



6. The summary should show an update of the total number of records in the file. Click **OK**



Create a Sample File

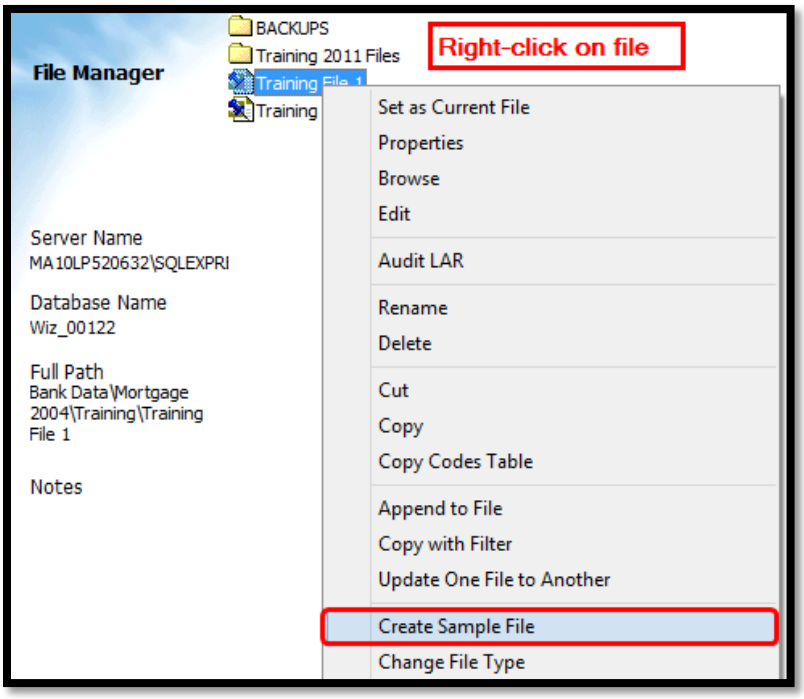
Within File Management you have the ability to create a totally random sample of your file. Reasons for creating a sample file may include fulfilling a request by an examiner or for fair lending review purposes.

The following exercise uses 'Numerical Sampling'. Numerical Sampling uses an interval sampling, meaning that based on the Precision Level and Reliability Level selected records will be selected at certain intervals.

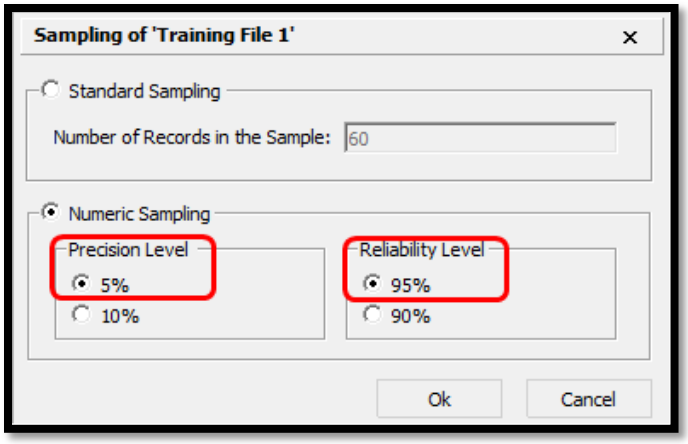
Standard sampling allows a user to select a random sample based on a specific sample size requested.

To create a sample file, follow these steps:

1. Right-click the file you wish to use to create a sample



2. For this example, select Numeric Sampling with a **5% Precision Level**, combined with a **95% Reliability Level**



If you wanted to use Standard Sampling of 5%, for example, you would set a sample size of 5% of the records in the file

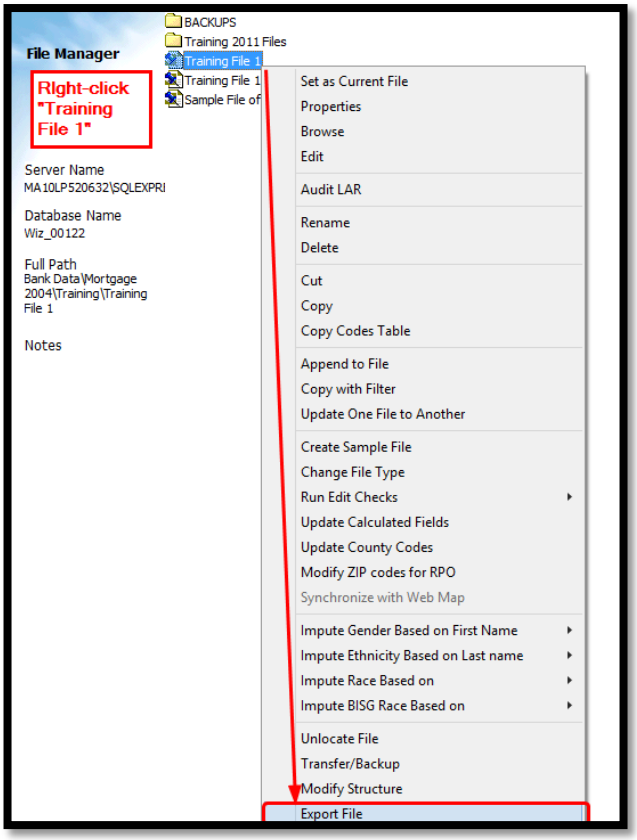
3. Click **OK**

Export a File

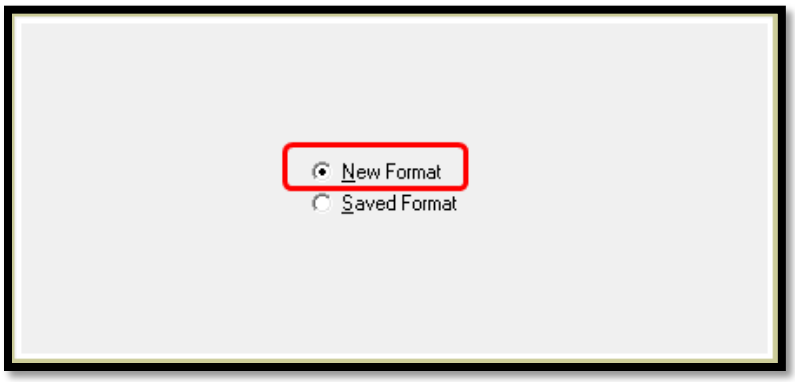
There may be times when users may wish to export from CRA *Wiz* to view, change or add additional fields to the data.

Users can export all or just selected fields, all or filtered records and choose whether to save the Export Format for future use.

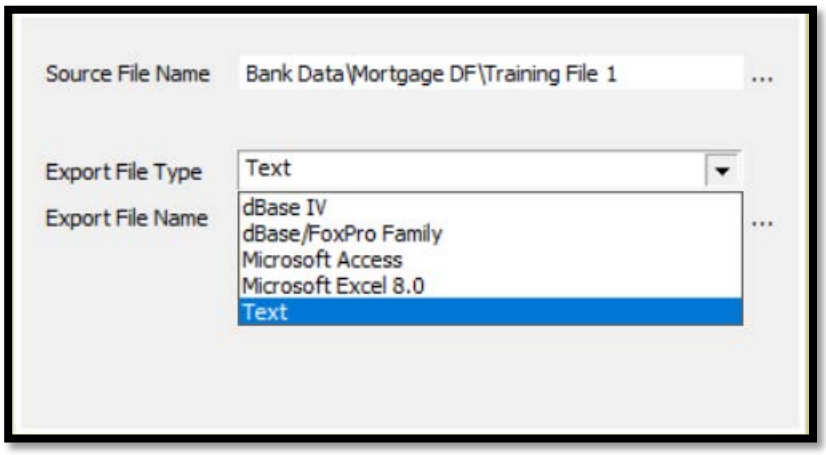
1. For this example, a sample of records (denied applications) and fields will be exported instead of the whole file
   a. Right-click the file to be exported
   b. Select **Export File** from the contextual menu



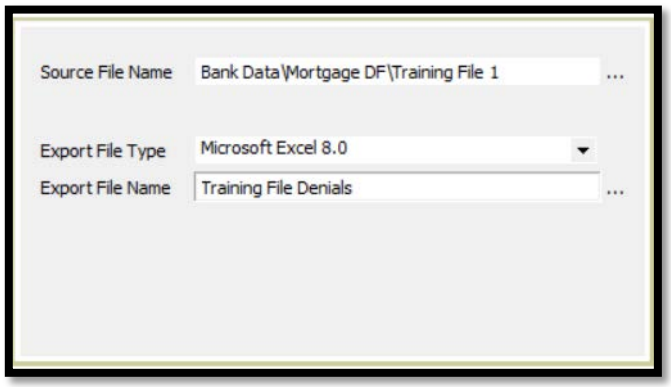
c. Accept the default of **New Format** and click the **Next** button



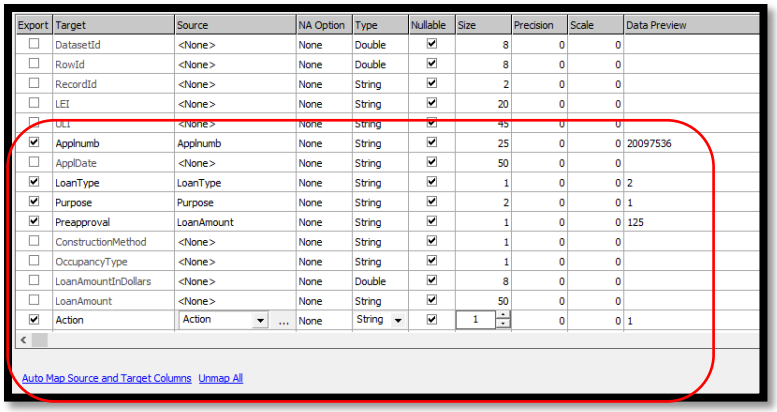
d. Click on the **Export File Type** drop down list
e. Select the format you wish to export to from the drop-down menu



2. Click the **Ellipsis** to define an Export File Name
   a. In the desired folder provide the name of the export file
   b. Click **Next**



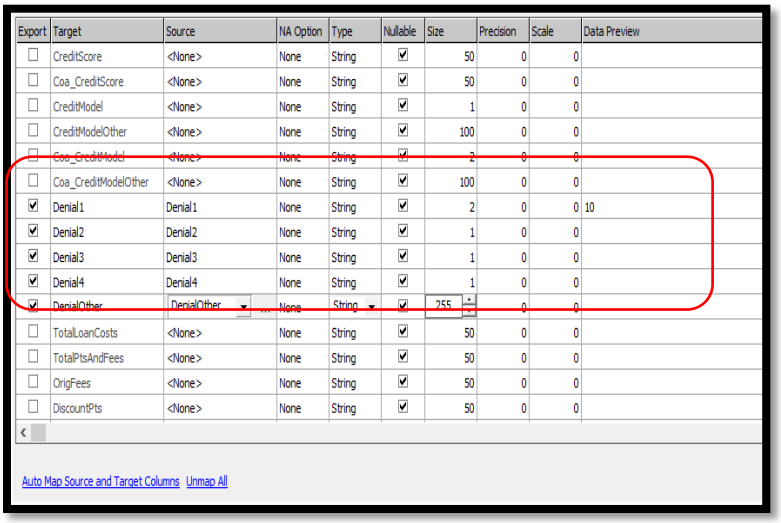
3. For this example, only limited fields for export will be selected. For each one, click in specified Row on the Source <None> and type the first few letters of the field you are looking for:
   a. **AppInumb**
   b. **LoanType**
   c. **Purpose**
   d. **LoanAmount**
   e. **Action**



Export	Target	Source	NA Option	Type	Nullable	Size	Precision	Scale	Data Preview
☐	DatasetId	<None>	None	Double	☑	8	0	0	
☐	RowId	<None>	None	Double	☑	8	0	0	
☐	RecordId	<None>	None	String	☑	2	0	0	
☐	LEI	<None>	None	String	☑	20	0	0	
☐	ULI	<None>	None	String	☑	45	0	0	
☑	AppInumb	AppInumb	None	String	☑	25	0	0	20097536
☐	ApplDate	<None>	None	String	☑	50	0	0	
☑	LoanType	LoanType	None	String	☑	1	0	0	2
☑	Purpose	Purpose	None	String	☑	2	0	0	1
☑	Preapproval	LoanAmount	None	String	☑	1	0	0	125
☐	ConstructionMethod	<None>	None	String	☑	1	0	0	
☐	OccupancyType	<None>	None	String	☑	1	0	0	
☐	LoanAmountInDollars	<None>	None	Double	☑	8	0	0	
☐	LoanAmount	<None>	None	String	☑	50	0	0	
☑	Action	Action	None	String	☑	1	0	0	1

Auto Map Source and Target Columns Unmap All

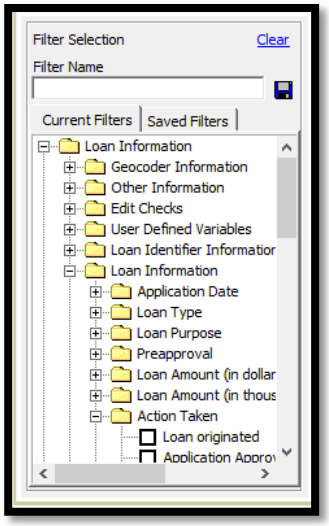
4. Scroll down to continue
   a. **Denial1**
   b. **Denial2**
   c. **Denial3**
   d. **Denial 4**
   e. **DenialOther**
5. Click **NEXT**



Export	Target	Source	NA Option	Type	Nullable	Size	Precision	Scale	Data Preview
☐	CreditScore	<None>	None	String	☑	50	0	0	
☐	Coa_CreditScore	<None>	None	String	☑	50	0	0	
☐	CreditModel	<None>	None	String	☑	1	0	0	
☐	CreditModelOther	<None>	None	String	☑	100	0	0	
☐	Coa_CreditModel	<None>	None	String	☑	2	0	0	
☐	Coa_CreditModelOther	<None>	None	String	☑	100	0	0	
☑	Denial1	Denial1	None	String	☑	2	0	0	10
☑	Denial2	Denial2	None	String	☑	1	0	0	
☑	Denial3	Denial3	None	String	☑	1	0	0	
☑	Denial4	Denial4	None	String	☑	1	0	0	
☑	DenialOther	DenialOther	None	String	☑	255	0	0	
☐	TotalLoanCosts	<None>	None	String	☑	50	0	0	
☐	TotalPtsAndFees	<None>	None	String	☑	50	0	0	
☐	OrigFees	<None>	None	String	☑	50	0	0	
☐	DiscountPts	<None>	None	String	☑	50	0	0	

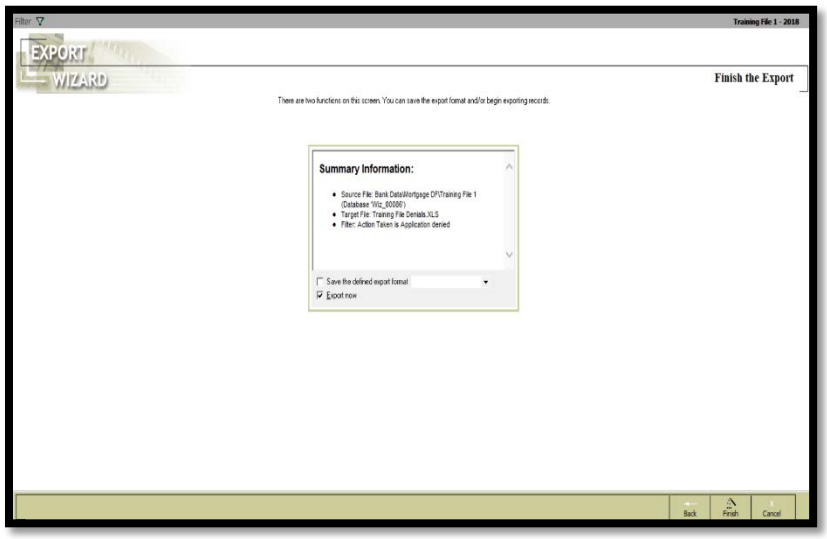
Auto Map Source and Target Columns Unmap All

6. On the Select Filters screen
   a. Open the **Loan Information** folder
   b. Open the **Loan Information** sub-folder
   c. Open the **Action** folder
   d. Select **Denied**
7. Click **NEXT**



8. Place a checkmark next to **Export Now**

9. Click **Finish**
10. Click **OK** when the export summary appears

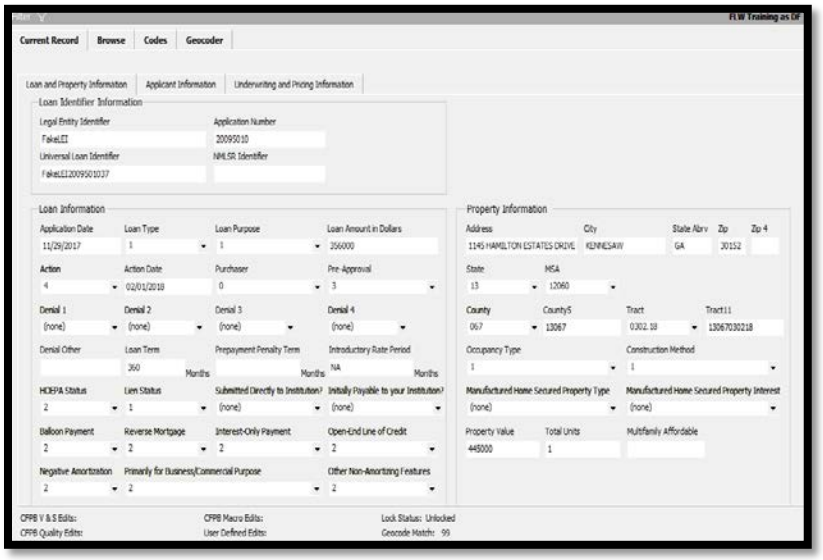


If you think you will be repeating this Export later, you can save the Export Format. Provide a descriptive name in the text box, along with the checkmark in the "Save the defined export format" box

Accessing the Edit Screen

To access the **Edit** screen, follow these steps:

1. Click the **Edit & Geocode tab**
2. Click the Edit button
3. First time in the file, the software displays the Current Record tab



Current Record Tab

The Current Record screen displays individual records in the loan file. The software displays record data in fields and drop-down menus which can be used to modify data.

Use the Current Record screen to view individual records. For HMDA DF File, there are 3 tabs:

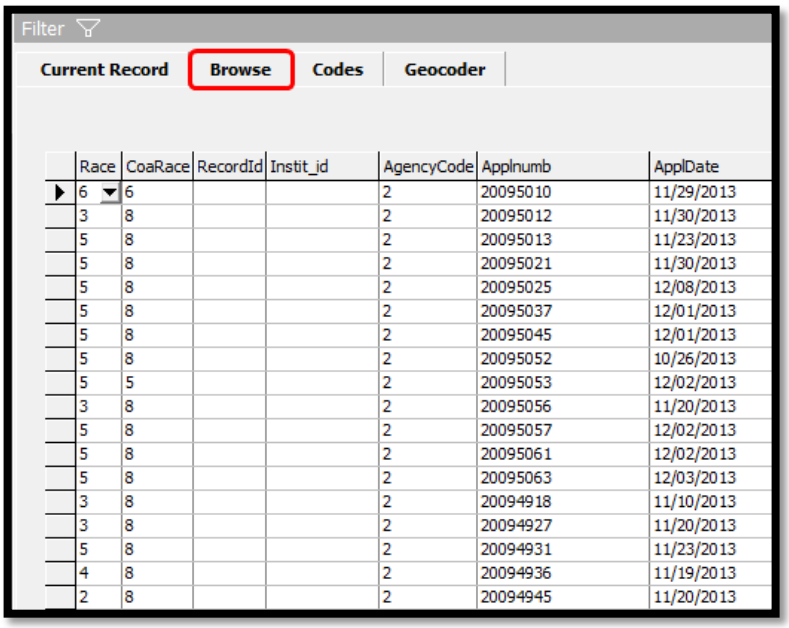
- Loan and Property Information
- Applicant Information
- Underwriting and Pricing Information
- **Rate Spread Calculator** is located in the Underwriting and Pricing Information Tab. Select Rate Spread Override check box to have CRA *Wiz* calculate the rate spread

Other file types will have one tab for the Current Record.

Edit Screen

Browse Tab

The **Browse** screen is used to view records in your loan file in a spreadsheet format. Records in the Browse screen can be modified by selecting data from either drop-down menus or by entering the information directly into a field. Users can also use the Replace Wizard to populate new or existing fields.

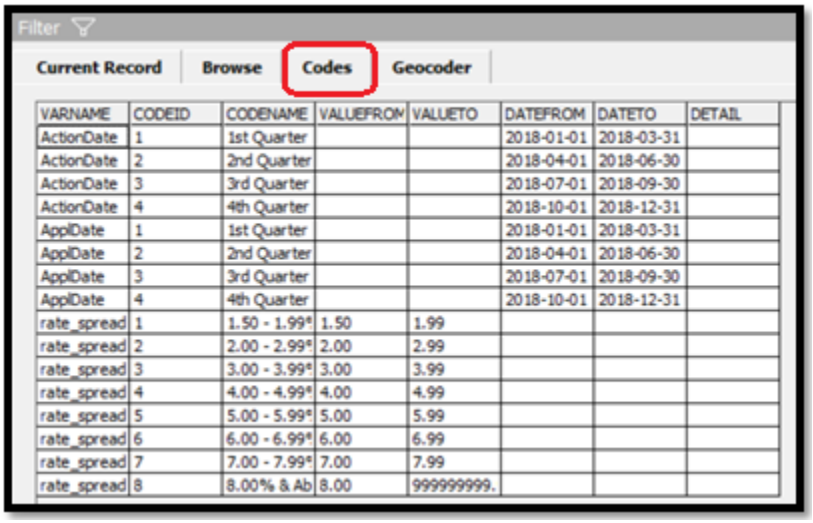


Race	CoaRace	RecordId	Instit_id	AgencyCode	ApplNumb	ApplDate
6	6			2	20095010	11/29/2013
3	8			2	20095012	11/30/2013
5	8			2	20095013	11/23/2013
5	8			2	20095021	11/30/2013
5	8			2	20095025	12/08/2013
5	8			2	20095037	12/01/2013
5	8			2	20095045	12/01/2013
5	8			2	20095052	10/26/2013
5	5			2	20095053	12/02/2013
3	8			2	20095056	11/20/2013
5	8			2	20095057	12/02/2013
5	8			2	20095061	12/02/2013
5	8			2	20095063	12/03/2013
3	8			2	20094918	11/10/2013
3	8			2	20094927	11/20/2013
5	8			2	20094931	11/23/2013
4	8			2	20094936	11/19/2013
2	8			2	20094945	11/20/2013

1. Click the **Browse** tab
   a. Column Headings - Right-click any column heading to display a contextual menu with commands for hiding and displaying columns, modifying codes, and locating a field
   b. Selection Buttons - Use to select a record. The software highlights the record you select. The software also indicates the record with a small arrow that displays in the selection button. You can also click on any field to select a record
   c. Edit Checks Display Area - Displays quality, validity, and geocoding errors in a loan record

Codes Tab

The codes tab displays user defined loan field codes in a spreadsheet format. Users can modify codes as needed. Code information includes the name of the field associated with the code, code name, values, dates, and detail. The codes tab includes the following elements:



VARNAME	CODEID	CODENAME	VALUEFROM	VALUETO	DATEFROM	DATETO	DETAIL
ActionDate	1	1st Quarter			2018-01-01	2018-03-31	
ActionDate	2	2nd Quarter			2018-04-01	2018-06-30	
ActionDate	3	3rd Quarter			2018-07-01	2018-09-30	
ActionDate	4	4th Quarter			2018-10-01	2018-12-31	
ApplDate	1	1st Quarter			2018-01-01	2018-03-31	
ApplDate	2	2nd Quarter			2018-04-01	2018-06-30	
ApplDate	3	3rd Quarter			2018-07-01	2018-09-30	
ApplDate	4	4th Quarter			2018-10-01	2018-12-31	
rate_spread	1	1.50 - 1.99*	1.50	1.99			
rate_spread	2	2.00 - 2.99*	2.00	2.99			
rate_spread	3	3.00 - 3.99*	3.00	3.99			
rate_spread	4	4.00 - 4.99*	4.00	4.99			
rate_spread	5	5.00 - 5.99*	5.00	5.99			
rate_spread	6	6.00 - 6.99*	6.00	6.99			
rate_spread	7	7.00 - 7.99*	7.00	7.99			
rate_spread	8	8.00% & Ab	8.00	999999999.			

- Columns - Display user-defined field code variables. By default, CRA *Wiz* displays a custom code for action date and application date by quarter; however, users have the ability to edit the codes to fit their date preference

Update Calculated Fields and Edit Checks

The CFPB (HMDA) and the FFIEC (CRA), issue a series of edit checks for HMDA and CRA files. Each edit must be reviewed and corrected prior to submission each year. Within the File Management module of CRA *Wiz*, there are two functions that will update the file:

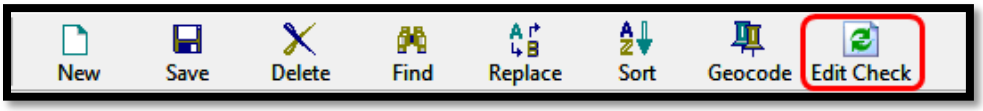
- ✓ **Run Edit Checks -** Runs all edit checks against the records within the file. This function updates the status of any edit checks that were previously identified in the file based on any new modifications and/or changes that may have made to the file

- ✓ **Update Calculated Fields -** There are critical fields contained in a file, depending on a file type, that track Race, Ethnicity, Gender, Age, the applicant's income level (Appl_incm_perc, Appl_incm_catg), the tract income level (PercMedian, Trct-incm_catg), the tract minority level (PercMinor, Mnrty_trct), reportable Rate Spreads (Rate_Spread), and Raw Rate Spreads (Raw_Rate_Spread), Revenues (Revcatg) (based on Revenues or an imported number), and Size Category based on the Loan Amount field (SizeCatg)

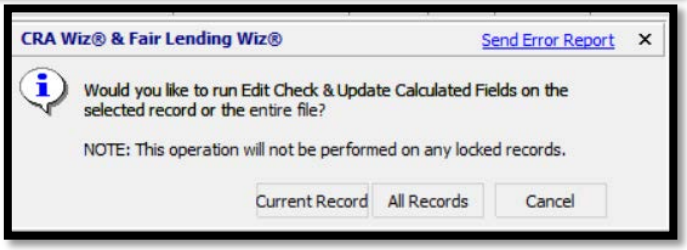
Ensure that the **Options > Year** is pointing to the same year as the Action Dates in the file so the correct edit checks will be applied to the current file.

There are three ways to run Edit Checks:

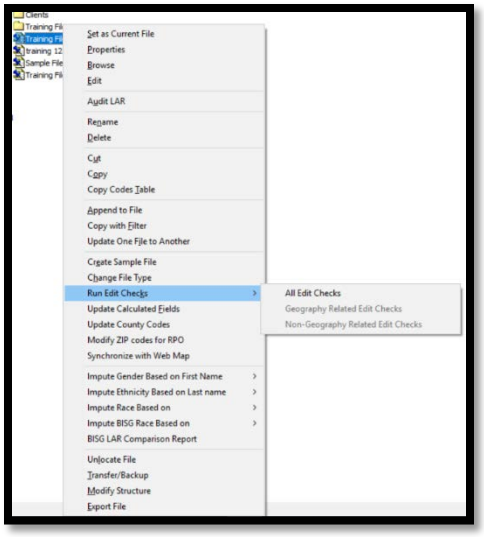
- Option 1: On the Edit Module Toolbar, click on the **Edit Check** button. The system will perform the Edit check on the current record



- Option 2: While in Browse view, click on the **Edit Check** button. The system will ask if you wish to run Edit Check and Update Calculated Fields on the selected records or entire file. The current record or entire file will have Edit Checks performed based on selection



- Option 3: Within **File Management**, right-click, and select **Run Edit Checks, then select All Edit Checks**



Understanding Editing Functionality

To ensure an accurate HMDA/CRA analysis and an error-free submission to the regulatory agencies, data must be checked for errors. If certain types of errors are found, they must be corrected prior to submission. The CRA *Wiz* Edit functions provide you with automated data validation by supplying the same predefined filters used by the CFPB and FFIEC to check your data.

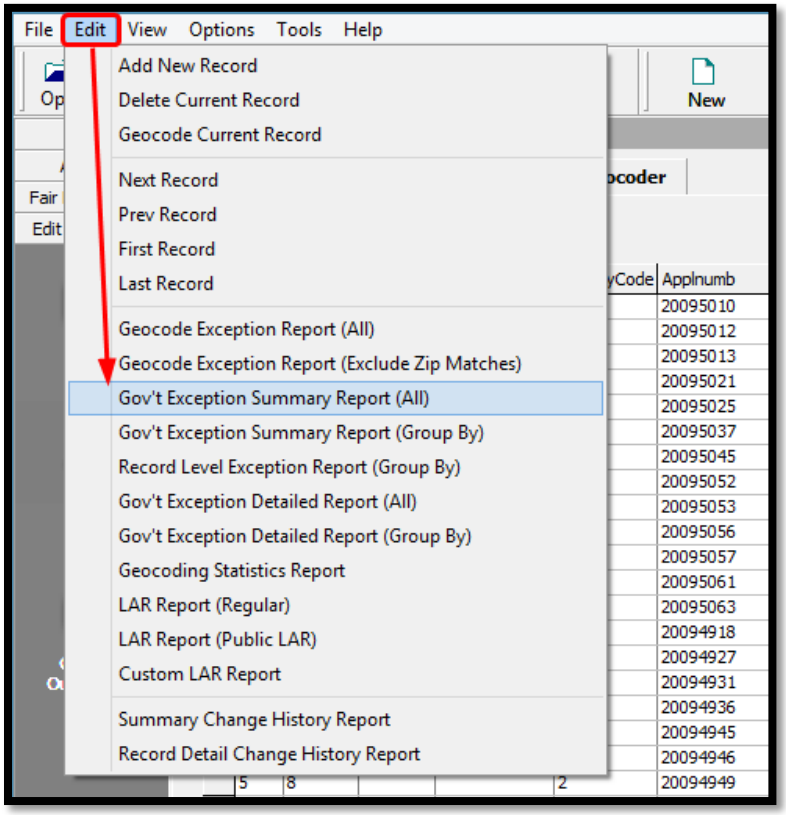
CRA *Wiz* supports four types of errors/edits:

Error Name	Example	Error Definition
Syntactical	Action year is 2018, activity year is 2019	Flags records with errors that will prevent the user from submitting. Often an incorrect year or missing application number.
Validity	Action code is missing or not in range 1-8	Flags data that is out of range of specified parameters, or field is blank. The government requires institutions to correct all validity errors before submitting loan records.
Quality	Applicant Income <=$9 thousand	Flags data that is an unexpected result, but that is not necessarily a validity error. You can submit loan records with quality errors. The government will notify you if any quality errors are found.
User-Defined	Used to set up user-defined error checks that will flag certain ratios, credit scores or CLTV values as errors before continuing Credit Score > 850 CLTV > 125 for originated loan	Users can create their own error checks to flag records for data problems or as a tracking tool.

Summary Exception Report

To generate the **Government Exception Summary** report, follow these steps:

1. Click the **Browse** tab
2. Click the **Edit menu**
3. Select the **Gov't Exception Summary Report (All)**
4. **Close the Report**

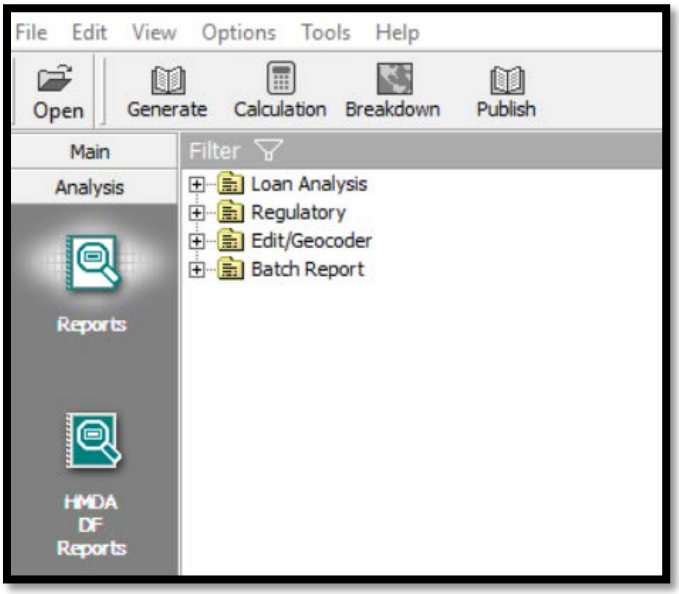


This report lists all edit types found in the active file and may consist of Syntactical, Validity, Quality and User-Defined edits. The report provides the error codes, error code description and the number of records. Transaction level exceptions can be found in the detailed reports or can be produced in HMDA DF Reports. Any record with a Validity or Syntactical error should be resolved.

HMDA DF Reports

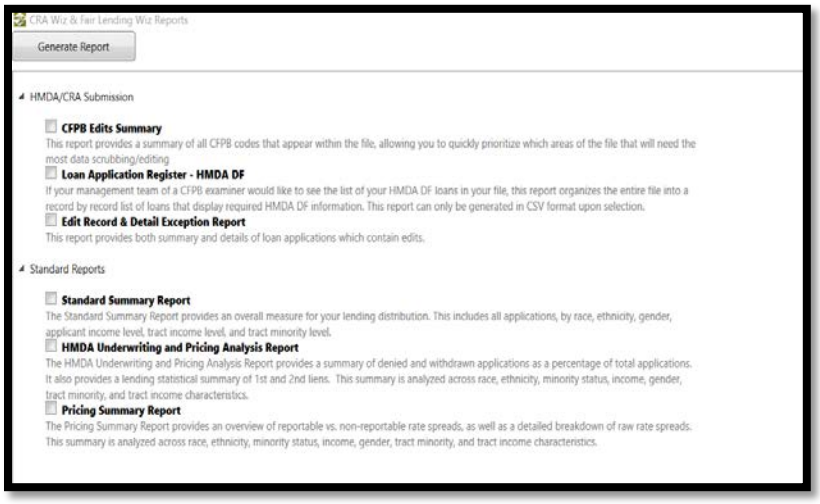
HMDA DF Reports are located in the Analysis section of CRA *Wiz*.

1. Click **Analysis** Tab



There are two sections within the HMDA DF Report writer:

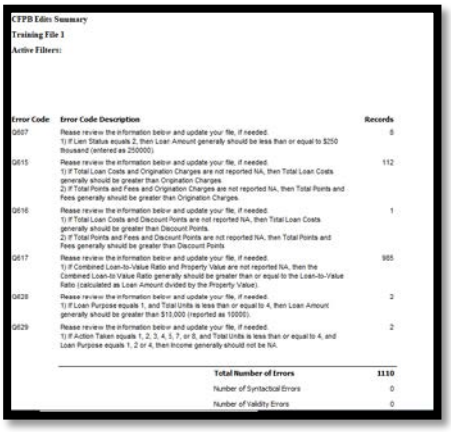
- HMDA/CRA Submission
- Standard Reports

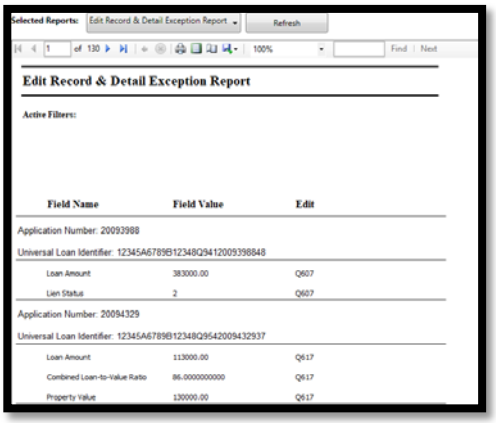


To generate a report:

2. Click on **CFPB Edits Summary** and/or Edit Record & **Detail Exception** Report
3. Click generate
4. Resolve any record with Syntactical or Validity edits

- **CFPB Edits Summary** will provide a total of syntactical, validity, and quality edits within the HMDA DF File
- The **Loan Application Register – HMDA DF** will provide the entire HMDA LAR in csv format
- The **Edit Record and Detail Exception Report** will provide transaction level edits with the applicable data field, the current data value and the relevant edit
- The **Standard Reports** are also found in the Fair Lending *Wiz* module under Fair Lending Reports



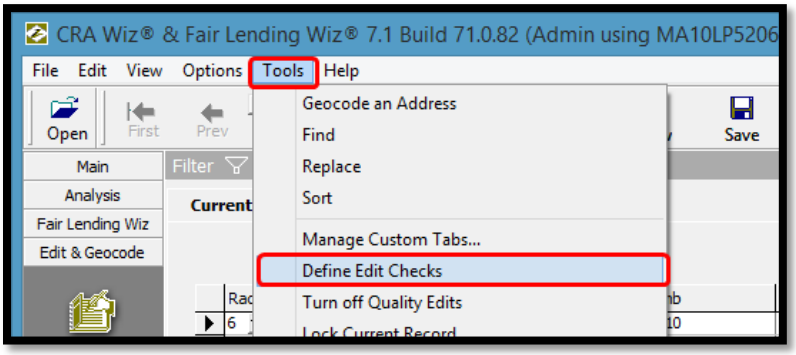


User-Defined Edit Checks

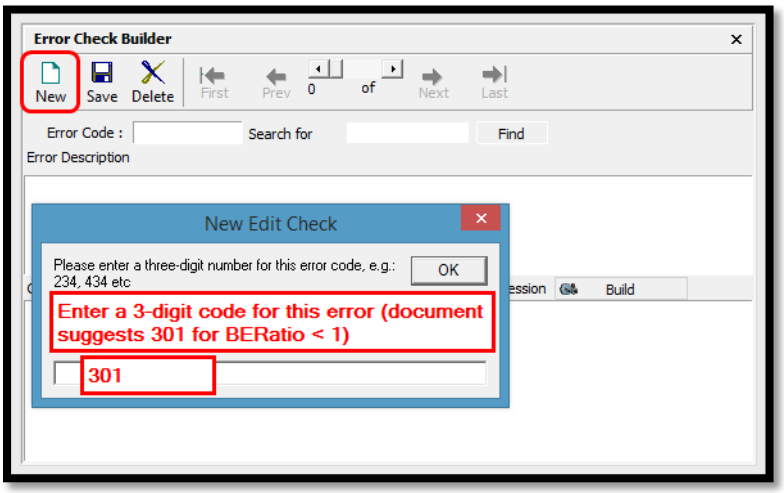
Within *Wiz, t*here is an option to create user-defined checks. User-defined edit checks may be useful for an institution to monitor the data for "errors" that may not trigger a standard error defined by the CFPB or FFIEC, but may be an error for the institution, such as loan types or purposes that the institution does not offer, or ratio values that may be skewed.

For Training purposes, three statements will be added to the Edit Check routines to look for these conditions.

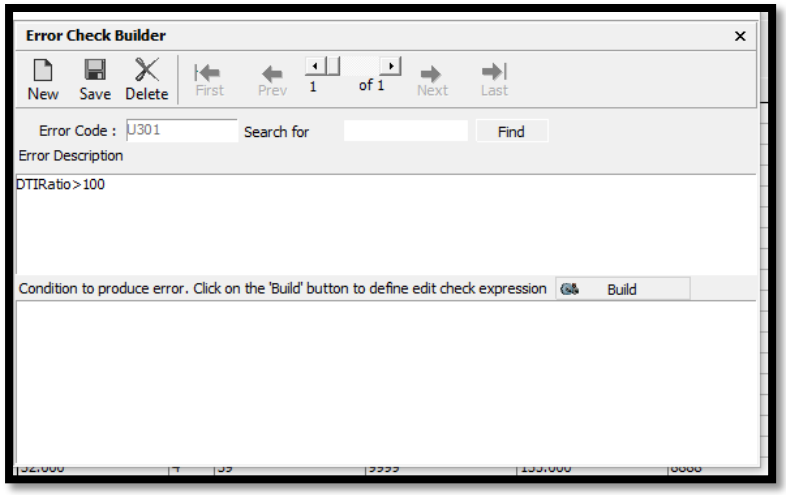
1. To create user-defined edit checks:
   a. In File Management, right-click the file that you wish to add user-defined edits to
   b. Select **Edit**
   c. Select the **Browse tab**
   d. Click the **Tools** menu
   e. Select **Define Edit Checks**



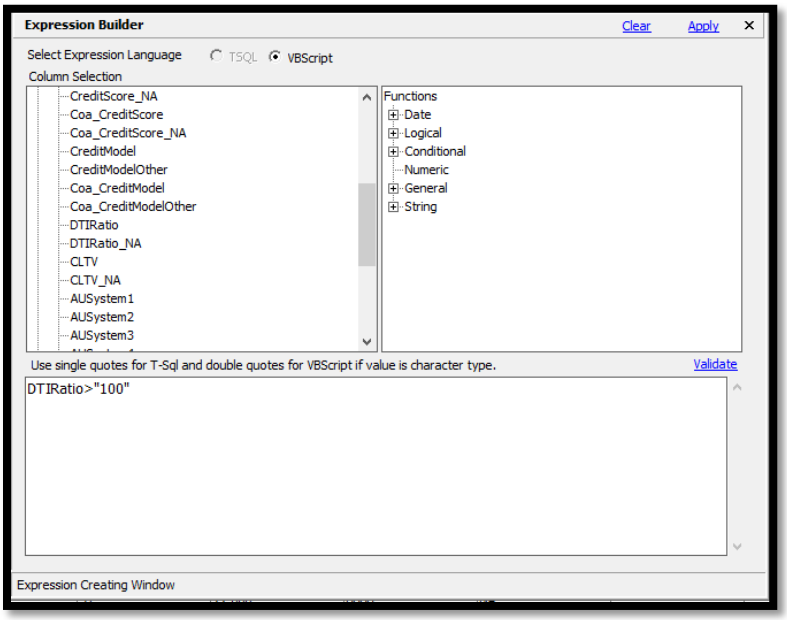
2. Click **New**
3. Enter a value for the error code. In this example, "**301**"
4. Click **OK**



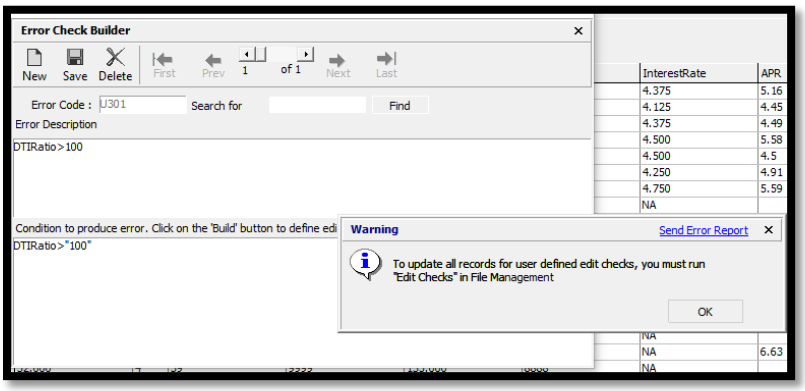
5. In the Error Description, type a description of the error you wish to define. For this example, **DTIRatio>**100
6. Click the **Build** button to open the Expression Builder



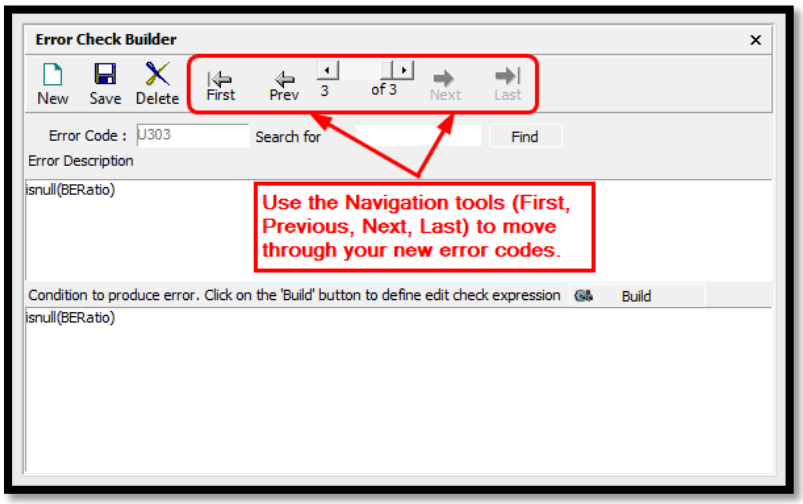
7. Type the Expression used to find the presumed error: **DTIRatio>100**
8. Click **Apply**

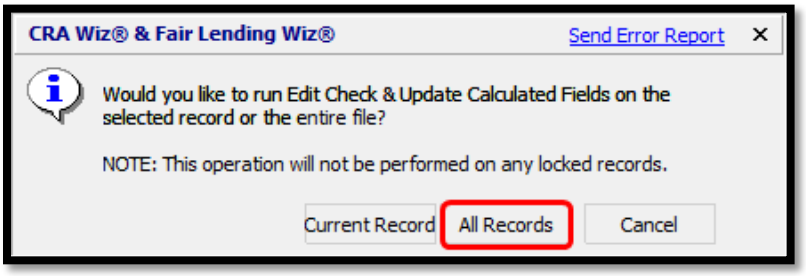


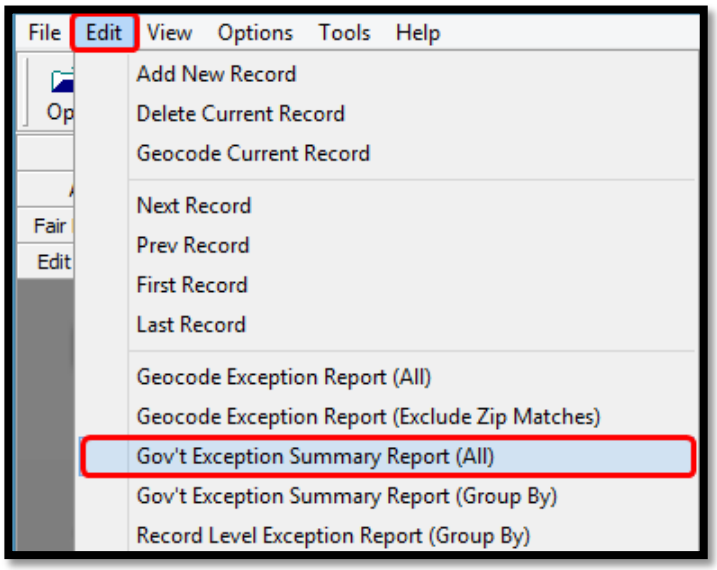
9. Click the **Save** button
   a. Click **OK** to the message reminding you to "Run Edit Checks" after the new error checks are completed



10. To add additional codes, Click **New** and add the next Error Code, for this example, **"302"**
11. In this case, the **Error Description** and **Expression** are identical: **DTIRatio > 50 and Action= "1"**
12. Click **Save**,
    a. Click **OK**
13. Click **New** again and add the next Error Code, for this example, "**303"**
14. In this case, the **Error Description** and **Expression** are identical: **DTIRatio<43 and Action= "3"**
15. Click **New** again and add the next Error Code, for this example, "**304"**
16. **In this case, the Error Description** and **Expression** are identical: **DTIRatio<1**
17. Click **Save**
    a. Click **OK**
18. **Close** the Error Check Builder
19. On the Toolbar click the **Edit Check** button
20. Select **All Records** from the dialog box
21. Select **Run Edit Checks**
22. Click **OK** to the "…completely successfully" message
23. In the Menu (top of screen) click **Edit**
24. Select **Gov't Exception Summary Report (All)**







RESULTS:

U301	DTIRatio>100	26
U302	DTIRatio>50 and Action is 1	371
U303	DTI<43 and Action="3"	152
U304	DTIRatio<1	1

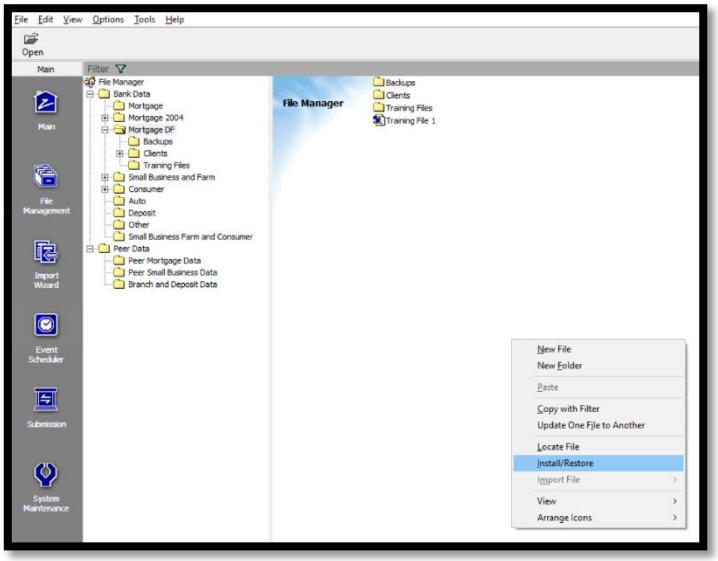
25. Close the Exception Report

Install a File

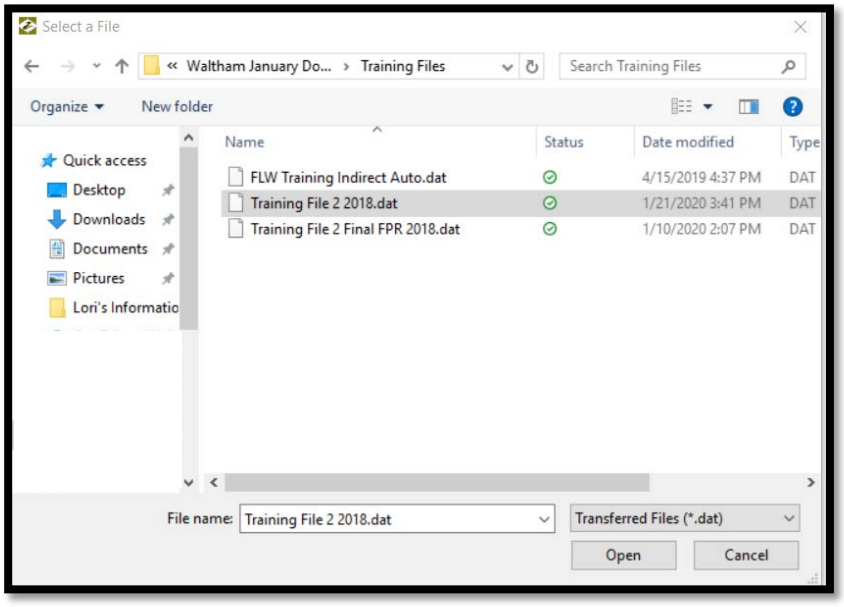
As we learned earlier in this chapter, the purpose of the **Transfer** function is to create an exact duplicate of a file in another location. The **Install** function installs the transferred file back on the local machine, or workstation. Since the **Transfer** function compresses the copy, the copy takes less space too.

To install a file, follow these steps:

1. **Right-click** anywhere in the display pane
2. From the Contextual menu, select **Install/Restore**

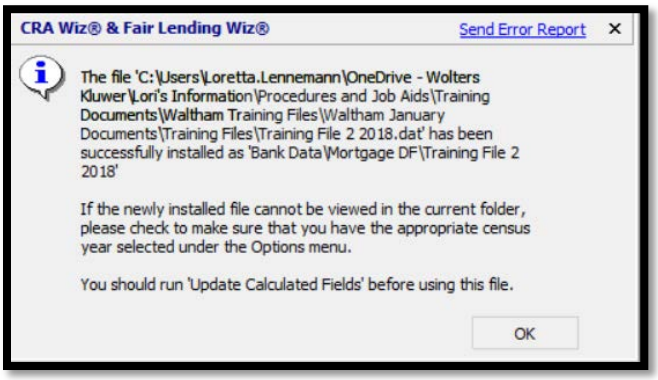


3. **Double-click on the file to be restored,** or single-click on the file and
   a. Click **Open**



4. A lengthy message will pop up on the screen. Look for the words "…successfully installed…"
   a. Click **OK**

5. In File Management, **right-click** on the file and Update Calculated Fields
   a. Then select "**Set as Current File**"



Additional Functionality

Information on additional functions and features listed below can be found in the CRA *Wiz* Data Prep Training Manual

- Rename a File
- Properties
- Synchronize with Web Map
- Create New File
- Modify ZIPs for RPOs (Rural Post Office)

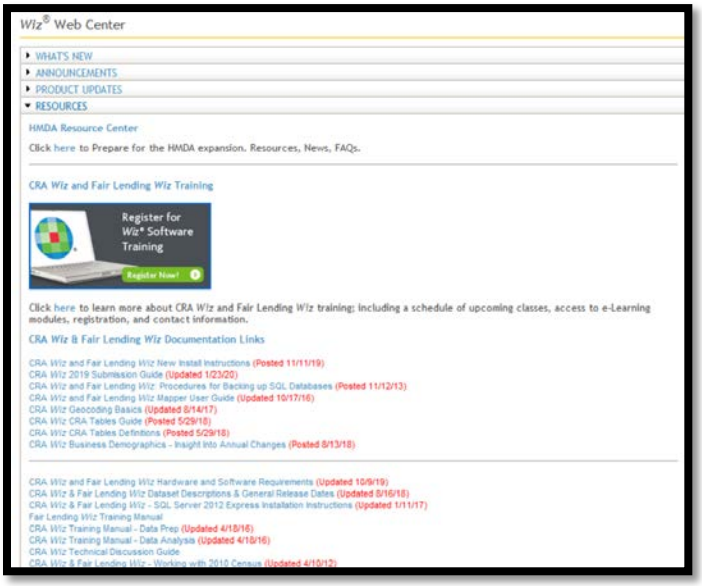
Chapter 6 - Edits Required for Fair Lending

Editing is the process of finding and correcting errors within your data file, not only for HMDA or CRA reporting, but to ensure the best possible data is available for fair lending analysis. The Edit screen can be used to find and correct errors in existing fields, as well as using functions such as Sort, Replace, Find, Delete and Filter to assist you further.

On January 1, 2018, new rules became effective for the Home Mortgage Disclosure Act. New fields were added to the required fields that must be submitted to the Government by March 1st each year. At Wolters Kluwer, we have been using a substantial number of these new fields for years to analyze fair lending patterns.

Data Needed for Fair Lending Analysis

Data needed to perform a robust fair lending analysis is dependent upon how the institution does business and what data is collected for analysis. A starting point for each type of data can be the File Type Structures listed on the *Wiz* Web Center which cover structure requirements, fields and recommendations for each field.



After familiarizing yourself with the file types, structure requirements, possible fields and recommendations, review your data to determine if you may need additional fields or if you have all of the relevant data.

Keep in mind that although some fields may allow text and descriptive fields, it may be very difficult to isolate and use, especially when conducting regression analysis. Regression must be able to perceive information as numeric values, not text.

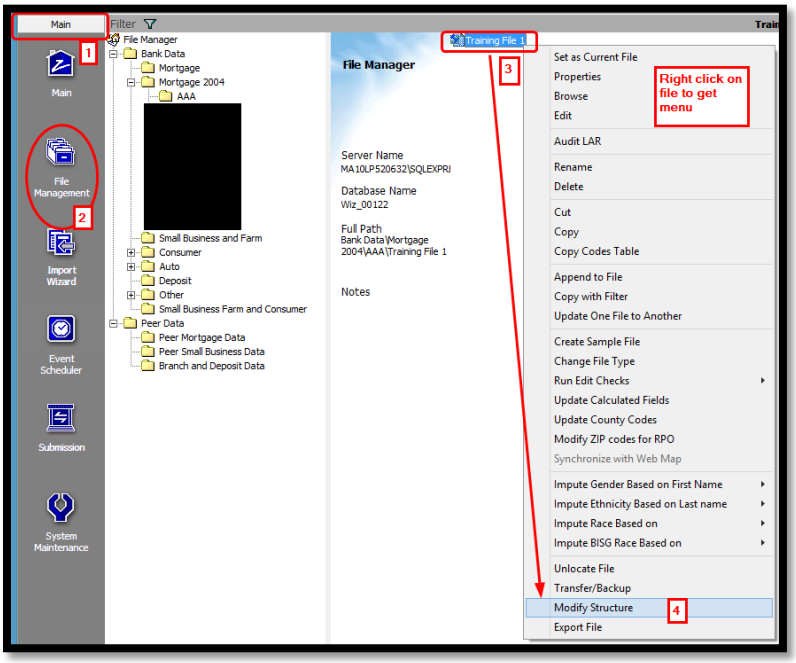
Creating New Fields Using the "Modify Structure" Feature

A Fair Lending *Wiz* user can create blank fields at any point – prior to an import, during an import, or after an import. You may remember that empty fields were created by including them in the imported file. We also created two new fields (remember FAKE_FIELD and FAKE_FIELD2?) by using the <Add New Column> feature in one of the import screens. The third method is to modify the structure of the database at the time you need to add a new field.

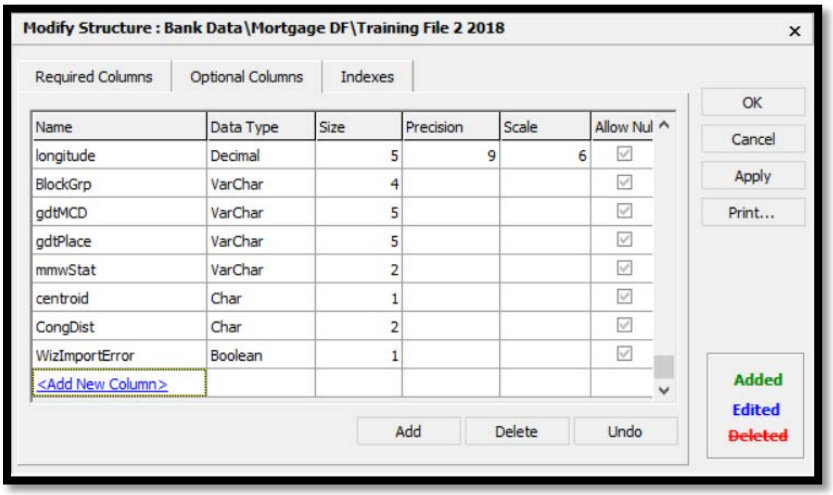
For this example, we will create three new fields, as follows:

- Investment, as an INTEGER field, from the OccupancyType HMDA field, Value= "3"
- SecondResidence, as an INTEGER field, from OccupancyType HMDA field, Value= "2"
- Employee_Flag, as an INTEGER field, from Employee field, Value = "yes" or "employee"

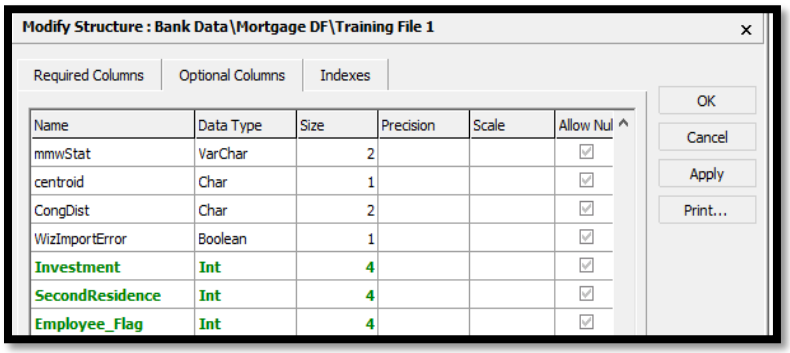
1. Click on **Main**
2. Click on **File Management**
3. Right click on the file you wish to update, for this example, **Training File 1**
4. Select **Modify Structure**



5. Click on the **Optional Columns** tab
6. Click on the **Add button** at the bottom of the window
7. With the Column00 highlighted in blue, type **Investment**
8. Click in the Data Type column and change to **Integer (Int)** (the size automatically goes to 4, or max value of 9999)



9. Repeat the process two more times, creating Integer fields called **SecondResidence, and Employee_Flag**
10. Click **OK (or Apply,** then **OK)**
11. **Right-click on the file and select Edit** (4th option)



Introduction to Expressions

Within CRA *Wiz* there are two languages available for creating expressions: (1) VB Script (Visual Basic) and (2) T-SQL (Transact-Structured Query Language). Within each of those languages, there are an extensive number of possible expressions that can be written and utilized.

The two used most often are the IIF(, ,) and INSTR(, , ,) functions. Spaces after the IIF or INSTR are forbidden, but extra spaces between the commas in the expression are acceptable.

- IIF(, ,) has 3 "arguments"
  - (1) WHAT condition to look for?
  - (2) What to do IF TRUE?
  - (3) What to do IF FALSE?
  - Example: IIF(Occupancytype= "3",1,0)
    - Asks IF occupancytype = "3", then place a 1 in Investment, but if it isn't true put a 0 in Investment

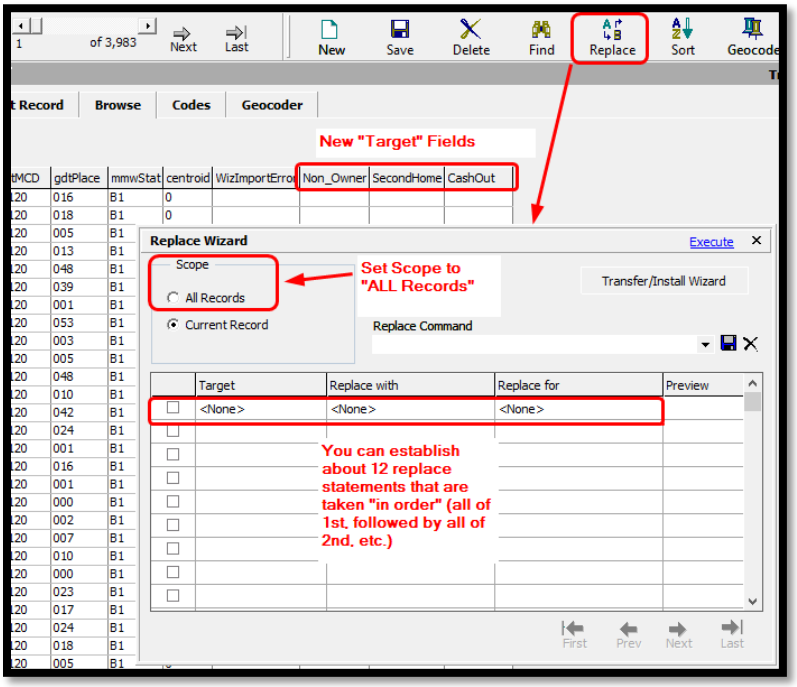
- INSTR(, , ,) has 4 "arguments"
  - (1) WHERE to start search?
  - (2) Search in WHAT TEXT?
  - (3) WHAT are you looking for?
  - (4) Text or Binary Search?
    - It returns a numeric value if it finds the text
  - Example: INSTR(1,Employee, "Yes",1)=1
    - Performs a Text search starting at the first letter of the Employee field, looking for word "Yes", and the "=1" means that it must be in the first position (leaving behind the non-employee loans)

Replacing Data

Create replace commands (also called **expressions**) that find and replace data in the file based on the rules and conditions selected.

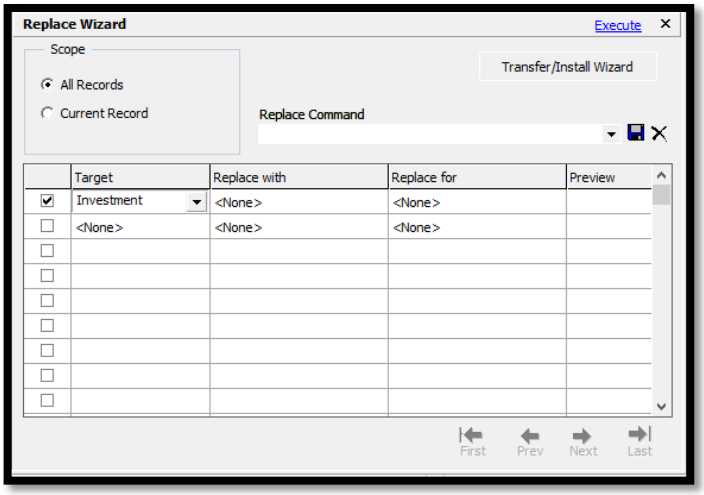
Use the **Edit** screen **Replace Wizard** to build replace commands. You can also save commands for later use.

1. In the Toolbar, click on **Replace**

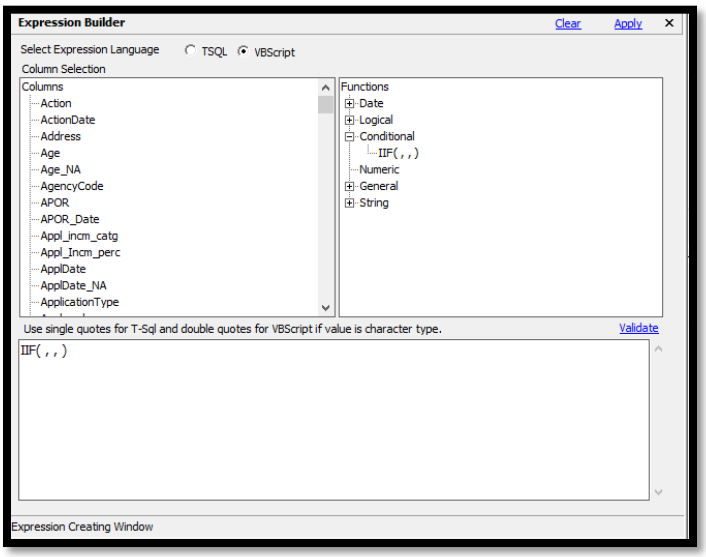


- **Scope** - use the option buttons to select whether you want to replace data in the currently selected record, or in your entire file
- **Transfer/Install Wizard** - use to transfer a replace command for back up purpose or for use by another CRA *Wiz* user. You can also bring in replace commands created by other users
- **Replace Command** - use this field to enter a name for the replace command and then save it
- **Check box** - select to start building your command
- **Target** - select the field in which you want to replace data
- **Replace with** - use to access the **Expression Builder**. Use the Expression Builder to build an expression that specifies the data you want to use
- **Replace for** - use to access the Expression Builder. Use the Expression Builder to build an expression that specifies the **condition** under which data should be replaced (and when it shouldn't be)
- **Preview** - displays the data in the field you are replacing
- **Navigation buttons** - use to display records in the Preview

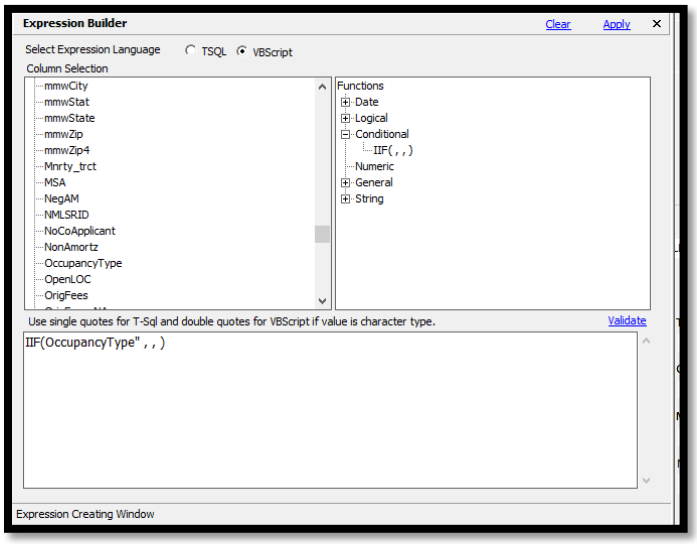
2. Select **ALL Records** as the Scope
3. Activate the first Target by placing a **checkmark** in the first column. (**TIP**: after opening the list of potential fields with the drop-down arrow, Type (don't scroll first) the first letters of the field you are looking for (in this case I N V) until the search for Investment is successful, then select the field)



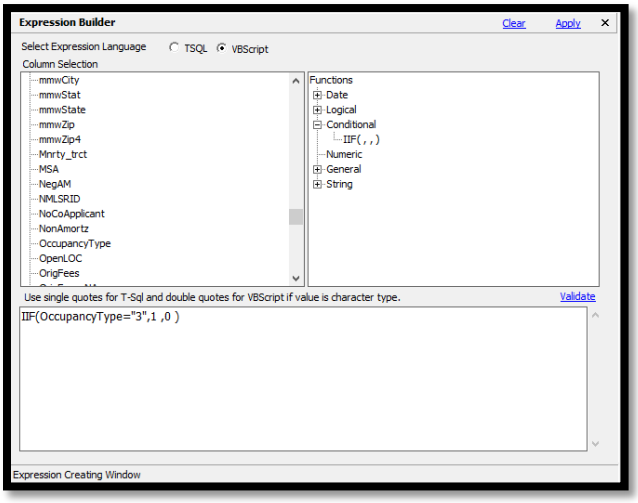
4. In the Replace With row for Investment, **click the Ellipsis**
5. **Double-click** the conditional expressions function list to open it
6. **Double-click the IIF function**
7. With the IIF function in the expression window, click in between the opening parenthesis and the first comma



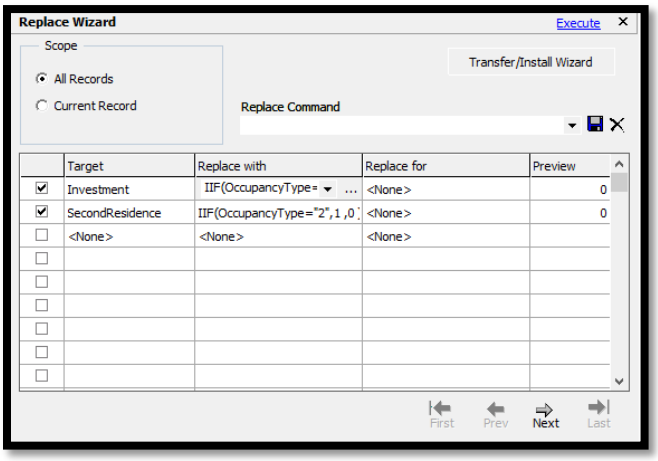
8. Activate the Columns list by clicking anywhere in the list (the word Columns turns blue)
9. Type the letters **O C C** until the word appears in the list, then double-click on **OccupancyType**



10. Place your cursor **after** the word OccupancyType in the expression window and **type: = "3"** (quotes are suggested whenever matching text)
11. **Move your cursor** AFTER the first comma and **type a 1** (no quotes this time)
12. **Move your cursor** AFTER the second comma and **type a 0** (again, no quotes)
13. Click **Apply**

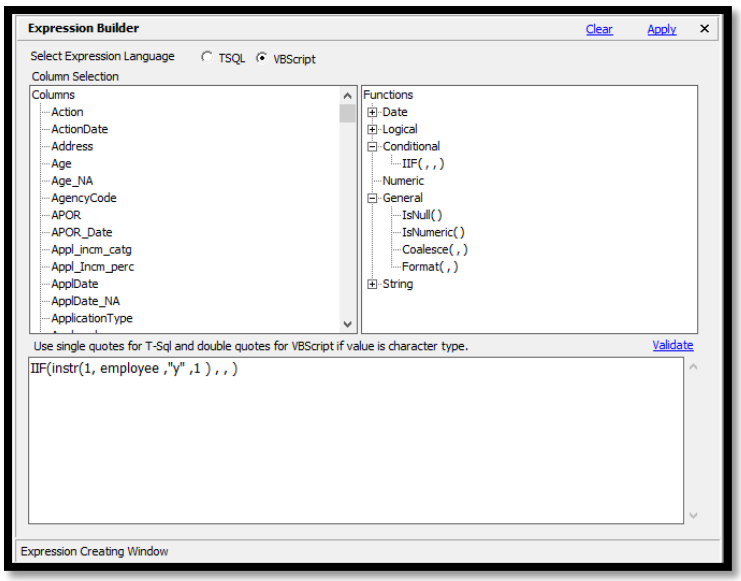


14. Define the **SecondResidence** field with the following expression: IIF(Occupancytype= "2", 1, 0)

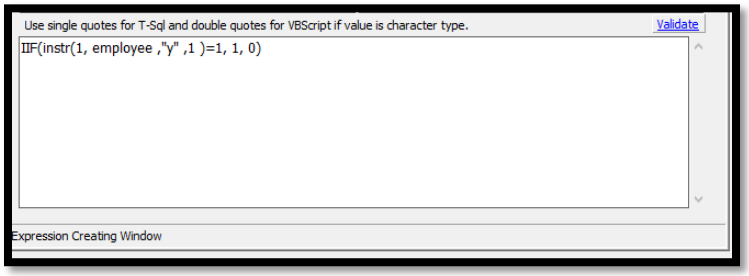


The third replace command will use a combination of the IIF and INSTR functions. In words: IF the INSTRING function finds the WORD "Y" starting in the first position of the Employee field, then put a 1 in the Employee_Flag field. If it doesn't then put a 0 in the Employee_Flag field.

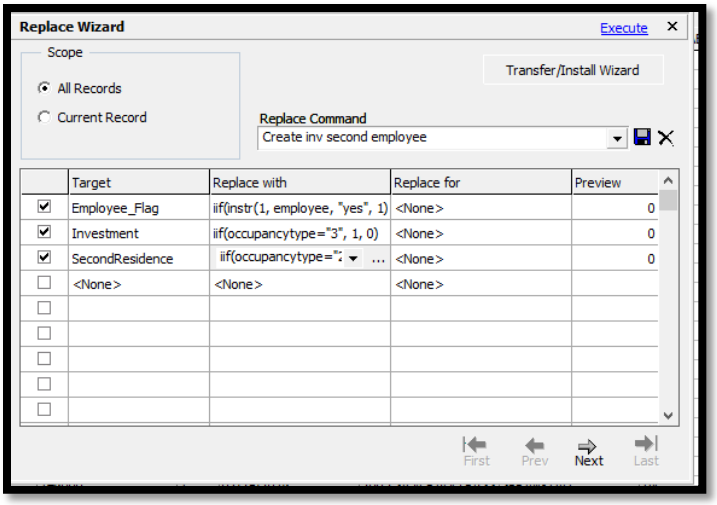
1. Select the **Target field** as **Employee_Flag**
2. Click the **Ellipsis** to open the Expression Builder
3. Open the Conditional functions list and **double-click IIF(, ,)**
4. Place the cursor after the opening parenthesis, open the **String function list** and **type the letter "I"** for instring. **Double-click** when found
5. **Type a "1"** (no quotes) after the opening parenthesis and **type a "1"** (no quotes) before the closing parenthesis of the Instring function IIF(InStr(1 , , ,1) , ,)
6. Place the cursor **after the first comma** in the Instring function



7. Activate the Columns list and **type EMP**. **Double-click** when found
8. In the **third argument** of the Instring function, type **"Y"** including the quotes
9. To complete, type in "**=1**" after the closing parenthesis of the InString function. The =1 to finish the InString function ensures that the letter "Y" must appear in the first position
10. Complete the IIF arguments by typing a **1 in the TRUE** statement, and **0 in the FALSE** statement
11. Click **Apply**



12. In the Replace Command Save text box, type "**Create Inv Second Employee**" then click the **Save** button (the diskette)
13. When ready, click on the **Execute** button



Consider creating new fields that are meaningful to the data set that is being used. Some examples are provided below:

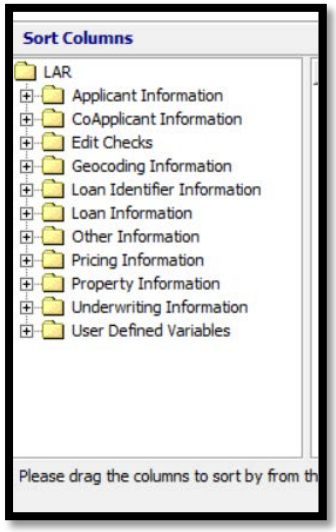
1. ConstPerm_Flag. An INTEGER field created from ConstPerm field = "Yes" or "CP" (make sure you pick up any value that indicates construction to perm). Value of 1 = True in new field
2. CONDO. An INTEGER field created from SFRType = "Condo" (make sure you don't pick up those HR Condo's). Value of 1 = True in new field
3. Cust_Credt. An INTEGER field created from CreditScore. (Watch for 7777 and 8888 and do not copy those values as they are not a credit score)
4. CSGT720. An INTEGER field created from CreditScore where CreditScore >= 720. Value of 1 = TRUE in new field. (Watch for 7777 and 8888 and do not copy those values as they are not a credit score)

Some institutions report CreditScore and Coa_CreditScore. When performing regression and comparative file review, only one credit score can be used in the models. Therefore, a determination of which score to use must be made. Consider creating a field called cust_credt that can be populated with the appropriate score. This could be different for pricing and decisioning, as well as loan products.

Validating Data Using the Sorting and Filtering Functions

In CRA *Wiz*, it is possible to choose fields from eleven broad categories from which to sort or filter a particular LAR:

- Applicants Information (Income, Race, Sex, etc.)
- CoApplicants Information (Income, Race, Sex, etc.)
- Edit Checks (Edit Check results)
- Geocoding Information
- Loan Identifier Information
- Other Information
- Pricing Information
- Property Information
- Underwriting Information
- User Defined Variables



You may choose more than one desired field from the above list to sort or filter your file.

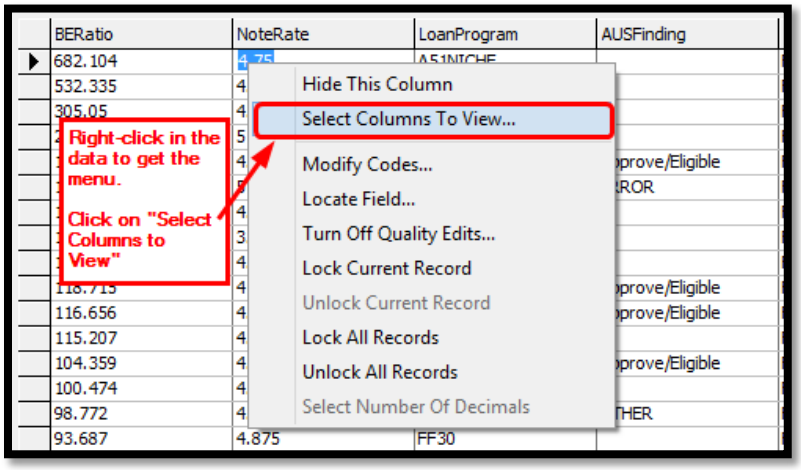
All primary fields that will be used in your fair lending analysis should be thoroughly checked for proper values.

Selecting Columns to View

Working in the **Browse** screen allows users to view all fields in a file, beyond the regulatory required fields. Wolters Kluwer recommends hiding or viewing columns in the **Browse** screen to make the editing process more efficient.

To select which columns you want to view, follow these steps:

1. Right click in the **Browse** screen
2. Select the **Select Columns to View** option from the Menu

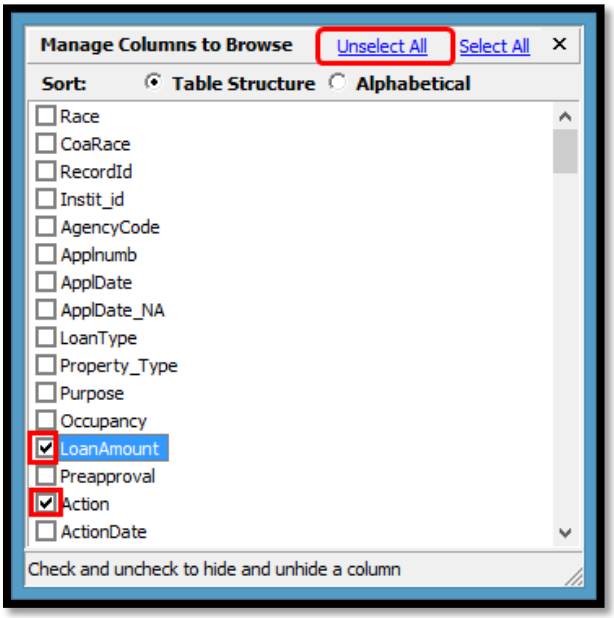


The software displays the "Manage Columns to Browse" dialog box.

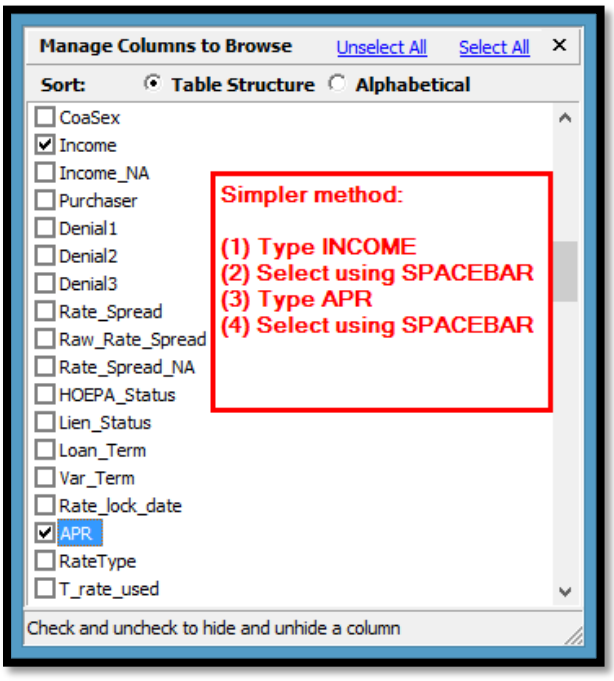
Options:

- Select All
- Unselect All
- Table Structure order (fields listed exactly how they are in the Browse tab)
- Alphabetical order

1. Click on Unselect All
2. Click on **checkbox for LoanAmount** (selecting it)
3. Click on **checkbox for Action** (selecting it)



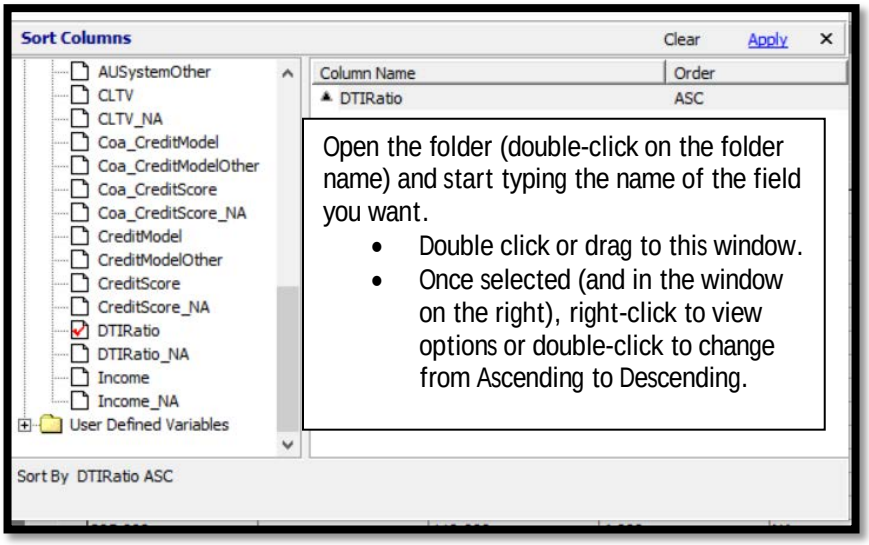
4. Using a simpler method, **type the word Income** then press the **spacebar** to select Income, once found
5. **Type APR** (must be seen as a complete word, not as the letter A, then a pause, then the letter P, then a pause, etc.). Press **Spacebar**.
6. In similar manner, select
   a. **AGE**
   b. **COA_AGE**
   c. **CUST_CREDT**
   d. **DTIRatio**
   e. **InterestRate**
   f. **CLTV**
7. Close the dialog box with the "x" in the upper corner (be careful, don't click Select All by accident)



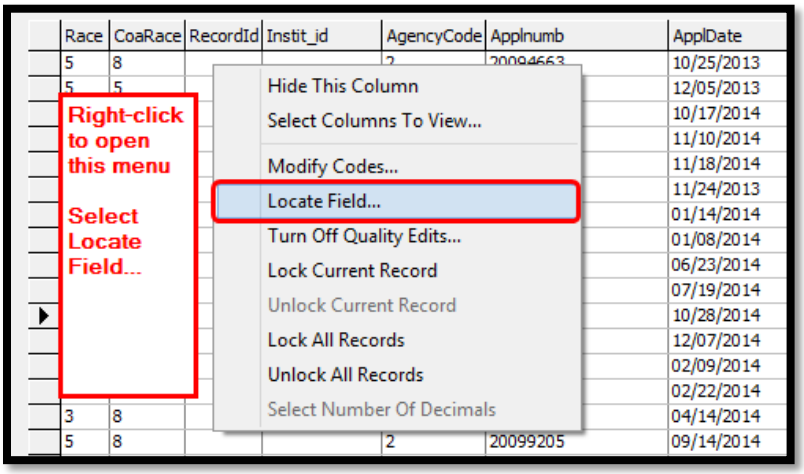
Any variable (factor or field) should have expectations based on your institution's product mix, policies and practices or the HMDA Regulation. Consider tracking any adjustments made to the data within your workpapers. Negative numbers can create havoc in analysis, and debt ratios higher than 999 can literally stop the program from continuing.

Sorting Records

1. From the **Browse** screen tool bar, click the **Sort** button
2. Double-click the **Underwriting Information**
3. Once opened, **double-click on DTIRatio**
4. Click **Apply**



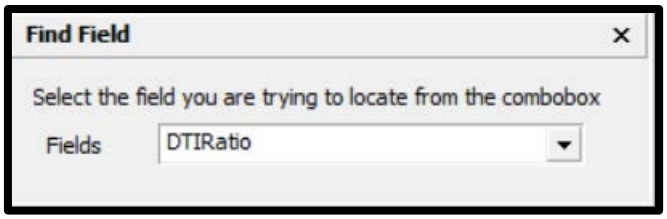
5. **Right-click** anywhere in the data to open a context-sensitive menu
6. Select **Locate Field…**



7. Click on the **drop-down arrow** to view the list of available fields
8. Once opened, **start typing DTIRatio** until it appears, then **Select**

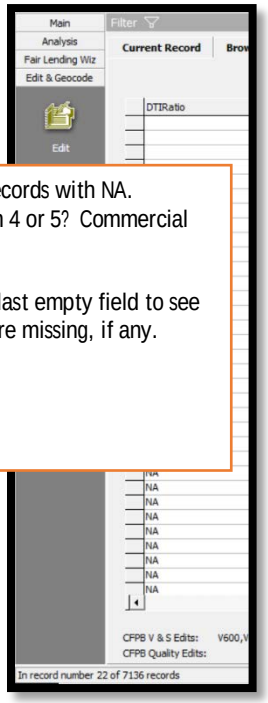
Open the list of fields that are in the current columns view.
Start typing DTI to start the search for DTIRatio
Select DTI Ratio

9. **Close the Find Field** box

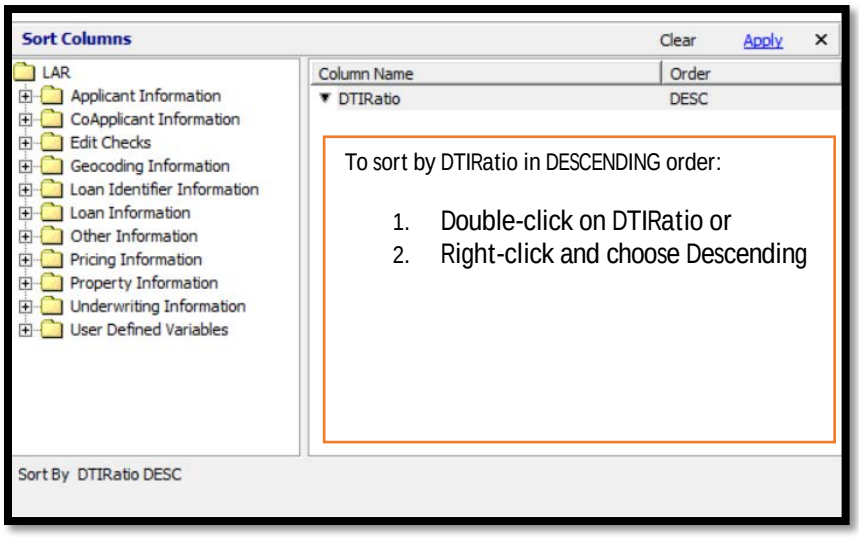


10. Review the results of the sorted data.

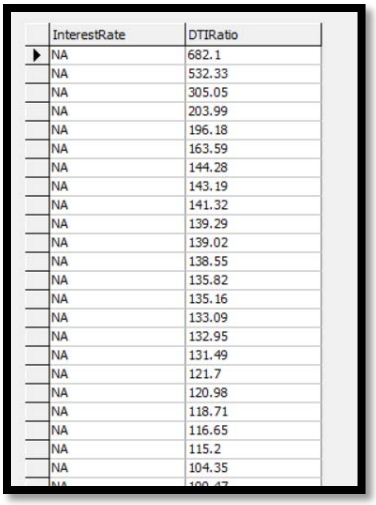
Missing DTI Ratios may indicate missing data, or there may be a reason such as commercial purpose applications. Review the results to determine if they make sense for your data set. If so, you may proceed. If not, you may want to go back to the source data to determine why the values may be missing.



11. Click the **Sort button** in the tool bar again
12. Right-click on DTIRatio and **select Descending** order
13. Right-click in data, select **LOCATE FIELD**
14. Open list, **type DTIRatio**
15. **Close Find Field** dialog box



16. Review the results to ensure they make sense for the data set



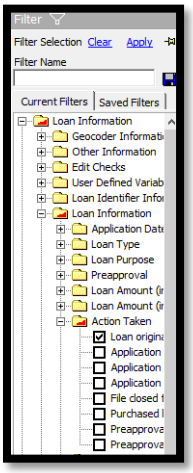
InterestRate	DTIRatio
NA	682.1
NA	532.33
NA	305.05
NA	203.99
NA	196.18
NA	163.59
NA	144.28
NA	143.19
NA	141.32
NA	139.29
NA	139.02
NA	138.55
NA	135.82
NA	135.16
NA	133.09
NA	132.95
NA	131.49
NA	121.7
NA	120.98
NA	118.71
NA	116.65
NA	115.2
NA	104.35

Knowing the data is important. If the majority of the ratios are above the institution's maximum allowed, something may have gone awry with the import. If the data makes sense for the data set, then you can proceed.

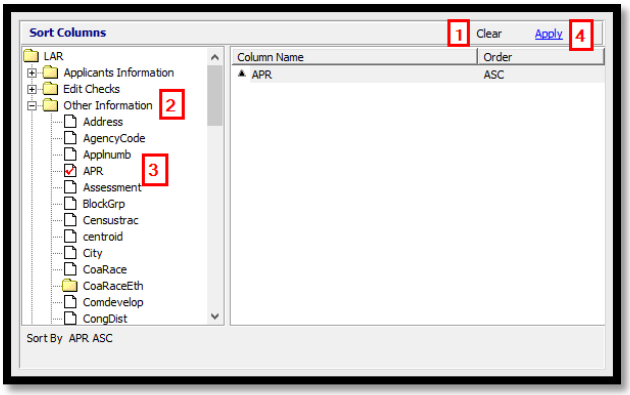
Filtering Records

The best data should be available on originated loans. Variables should make sense when viewed against the institution's product mix, pricing guidelines and exception policies.

1. Click on the **Filter** button
2. Open the **Loan Information** folder (by clicking the + OR double-clicking anywhere in the folder name)
3. Open the **Loan Information** and then **Action Taken** folders
4. Select Loan **Originated**
5. Click **Apply**



6. Click the **Sort** button
7. Click **Clear** to remove the current sort variable
8. Double-click the **Other Information** folder
9. Double-click the **APR** variable
10. Click **Apply**

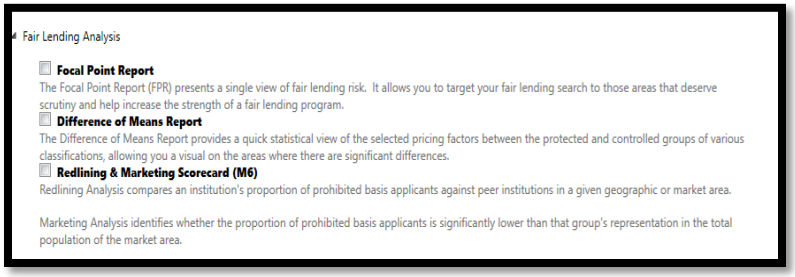


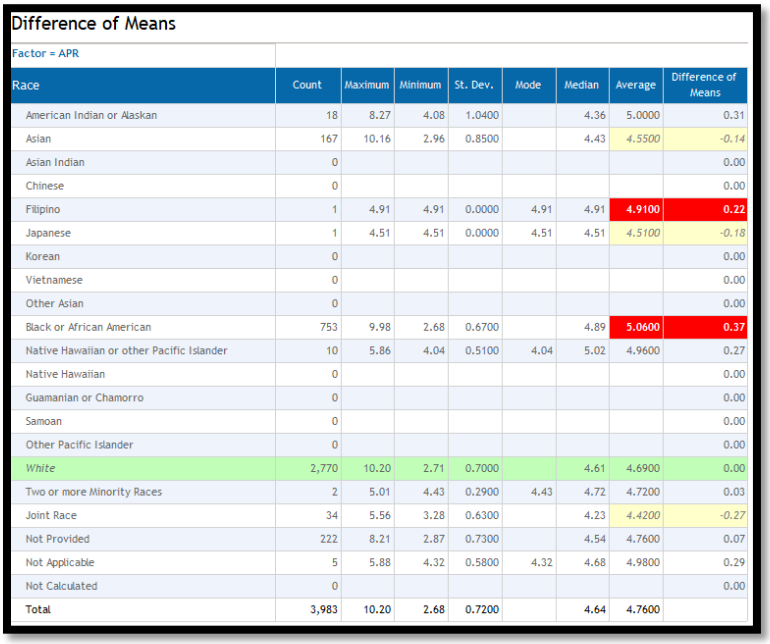
Data Quality Reports (Difference of Means)

Sorting and filtering for each variable provides the most detail, but a report is available that will allow users to understand at a high-level the quality of the data, such as the mean, median, mode, and minimum and maximum values of a field.

To run the Difference of Means Report:

1. Consider setting a **filter for originated or denied** loans
2. Click the **Fair Lending *Wiz*** button
3. Click the **Fair Lending Reports** button
4. Under the Standard Reports heading, click **Difference of Means Report**
5. Select by Race, Ethnicity, and other categories as you see fit
6. Then select the fields to analyze, such as APR, DTIRatio, CLTV, Cust_Credt, and InterestRate
7. Click **Generate Report**





Difference of Means

Factor = APR

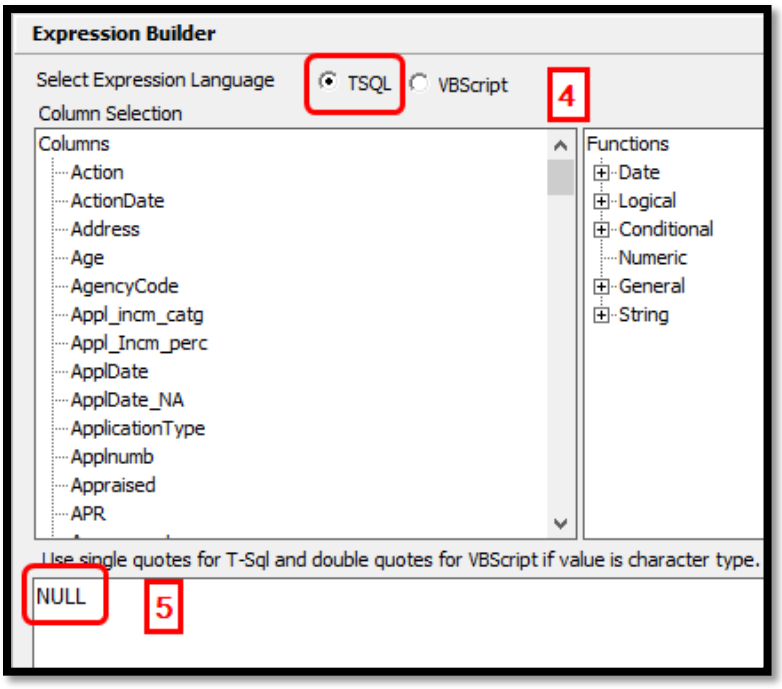
Race	Count	Maximum	Minimum	St. Dev.	Mode	Median	Average	Difference of Means
American Indian or Alaskan	18	8.27	4.08	1.0400		4.36	5.0000	0.31
Asian	167	10.16	2.96	0.8500		4.43	4.5500	-0.14
Asian Indian	0							0.00
Chinese	0							0.00
Filipino	1	4.91	4.91	0.0000	4.91	4.91	4.9100	0.22
Japanese	1	4.51	4.51	0.0000	4.51	4.51	4.5100	-0.18
Korean	0							0.00
Vietnamese	0							0.00
Other Asian	0							0.00
Black or African American	753	9.98	2.68	0.6700		4.89	5.0600	0.37
Native Hawaiian or other Pacific Islander	10	5.86	4.04	0.5100	4.04	5.02	4.9600	0.27
Native Hawaiian	0							0.00
Guamanian or Chamorro	0							0.00
Samoan	0							0.00
Other Pacific Islander	0							0.00
White	2,770	10.20	2.71	0.7000		4.61	4.6900	0.00
Two or more Minority Races	2	5.01	4.43	0.2900	4.43	4.72	4.7200	0.03
Joint Race	34	5.56	3.28	0.6300		4.23	4.4200	-0.27
Not Provided	222	8.21	2.87	0.7300		4.54	4.7600	0.07
Not Applicable	5	5.88	4.32	0.5800	4.32	4.68	4.9800	0.29
Not Calculated	0							0.00
Total	3,983	10.20	2.68	0.7200		4.64	4.7600	

Dealing with Incorrect Data

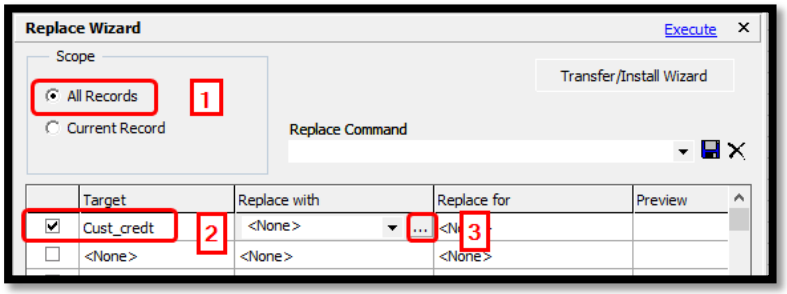
If incorrect data has been found in the file, the data will need to be corrected before analysis can begin. Refer to your institution's procedures on how to correct data, which may include updating the source file and subsequently updating the target file, or users may choose to "Null" the values within CRA *Wiz* to exclude them from the analysis.

How to Null Values

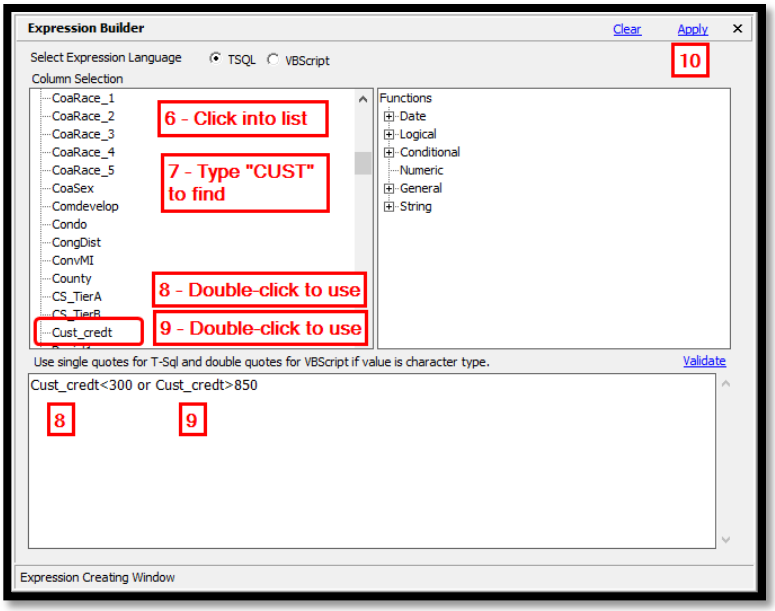
1. If you have not already done so, **close both the Report Viewer and Fair Lending Report selection screen**
2. If not in the Edit > Browse screen already, click on the **Edit & Geocode** button, then the **Edit** button
3. Click on **Filter** > **Clear**



4. In the tool bar, click on the **Replace Wizard** button
   a. Scope = **All Records**
   b. Target Field = **Cust_Credt** (remember to type CUST)
   c. Replace with = **Ellipsis**
   d. Select Expression Language **= TSQL**
   e. In the Expression Window = **NULL** (type the word NULL)
   f. Click **Apply**

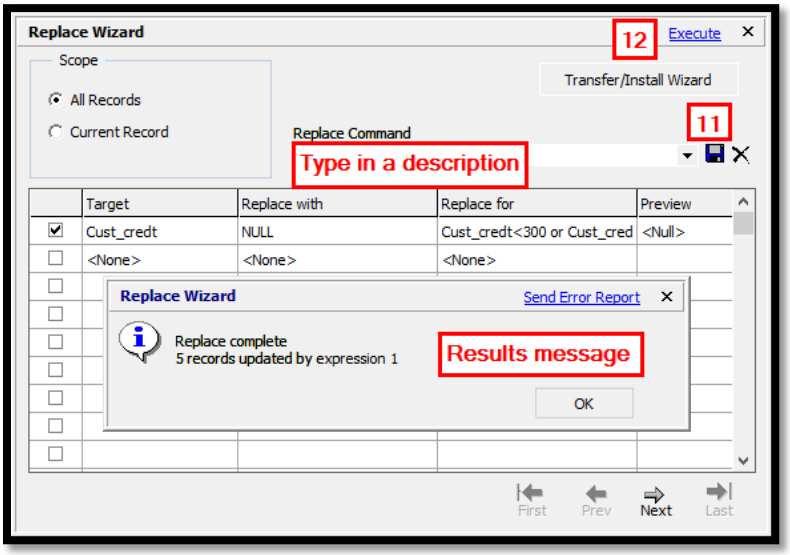


g. Replace for = **Ellipsis**
h. Click into the **Column Selection** list
i. Type the word "**CUST**" until found
j. Select **Cust_Credt**
k. Type **<300 or**
l. Select **Cust_Credt**
m. Type **>850**
n. Click **Apply**



There is no "UNDO" button for a replace statement. Always read the statement carefully before clicking the Execute button, especially if working with original data (rather than creating a new field). If there is a backup copy of the file (recommended) the field can be repaired, but it is best not to make an error in the first place.

5. In the Replace Command text box, type the name of the replace command you wish to save, in this case, "**Repair cust_credt too low or too high**"
6. Click the **Save** button
7. Click the **Execute** button



Additional Functionality

Instructions on additional functions and features listed below can be found in the CRA *Wiz* Data Prep Training Manual

- Finding Records
- Modifying Data
- Changing Tabs (Between Current Record and Browse)
- Finding Duplicate Records
- Deleting Records
- Adding Records
- Locking/Unlocking Records
- Tagging/Untagging Records
- Clearing Geocode Fields
- Printing the LAR/LR Reports
- Best Practices for Editing

Chapter 7 - Exam Procedures and Statistics

The Federal Financial Institutions Examination Council (FFIEC) Interagency Fair Lending Examination Procedures, which the Consumer Financial Protection Bureau (CFPB) adopted as part of their Supervision and Examination Manual, are the heart of fair lending monitoring and analysis.

This chapter will introduce fair lending concepts, as well as serve as an introduction to statistics.

- ✓ Statistics – how statistics relate to the questions raised in the examination procedures

The examination procedures themselves contain the following sections:

- ✓ Introduction to laws and regulations governing Fair Lending
- ✓ Part 1 - Examination Scope Guidelines
- ✓ Part 2 – Compliance Management Review
- ✓ Part 3 – Examination Procedures
- ✓ Part 4 – Evaluating Responses and Concluding the Examination
- ✓ Appendix – contains several sections that provide further details

Laws and Regulations Pertaining to Fair Lending

1. Equal Credit Opportunity Act
   a. Covers all aspects of a credit transaction (from initial contact through collections)
   b. Defines classes of individuals against whom discrimination is prohibited, including:
      i. Race or color
      ii. Religion
      iii. National origin
      iv. Sex
      v. Marital status
      vi. Age (provided the applicant has the capacity to contract)
      vii. Applicant's receipt of income from any public assistance program
      viii. Applicant's exercise, in good faith, of any right under the Consumer Credit Protection Act

2. Fair Housing Act
   a. Prohibits discrimination in all aspects of "residential real-estate related transactions"
   b. Prohibits discrimination based on:
      i. Race or color
      ii. National origin
      iii. Religion
      iv. Sex
      v. Familial status
      vi. Handicap

Types of Discrimination

There are three types of discrimination discussed in the Examination Procedures.

1. **Overt Evidence of Disparate Treatment** – verbal or written policy statements or actions that openly discriminate on a prohibited basis

2. **Comparative Evidence of Disparate Treatment** – occurs when a lender treats a credit applicant differently based on one or more of the prohibited bases. It does not require any showing that the treatment was motivated by prejudice or a conscious intention to discriminate against a person beyond the difference in treatment itself
   a. The analysis to look for disparate treatment can be known as "benchmark-overlap analysis", "matched-pair analysis" or "comparative file review"

3. **Evidence of Disparate Impact** – statistical evidence suggesting that a policy or practice, even though having the appearance of being neutral, disproportionally excludes or burdens certain persons on a prohibitive basis
   a. Regression analysis can be used to look for disparate impact

Examination Procedures Outline

1. Part 1 – Examination Scope Guidelines
   a. Background
      i. Understanding Credit Operations
      ii. "Before evaluating the potential for discriminatory conduct, the examiner should review sufficient information about the institution and its market to understand the credit operations of the institution and the representation of prohibited basis group residents within the markets where the institution does business."
   b. Evaluating the Potential for Discriminatory Conduct (Risk Factors)
      i. Develop an Overview
      ii. Identify Compliance Program Discrimination **Risk Factors**
      iii. Review Residential Loan Products
      iv. Identify Residential Lending Discrimination **Risk Factors**
      v. Organize and Focus on Residential Risk Analysis
      vi. Identify Consumer Lending Discrimination **Risk Factors**
      vii. Identify Commercial Lending Discrimination **Risk Factors**
      viii. Complete the Scoping Process

2. Part II – Compliance Management Review
   a. This section allows examiners to set the intensity of the examination based on their evaluation of the compliance management systems in place, as well as the reliability of the practices and procedures in place for ensuring fair lending compliance
   b. "*Determining whether the policies and procedures of the institution enable management to prevent, or to identify and self-correct, illegal disparate treatment in the transactions that relate to the products and issues identified for further analysis under Part 1 of these procedures."*
   c. *"Obtaining a thorough understanding of the manner by which management address its fair lending responsibilities with respect to (a) the institution's lending practices and standards, (b) training and other application-processing aids, (c) guidance to employees or agents in dealing with customers, and (d) its marketing or other promotion of products and services."*

3. Part III – Examination Procedures
   a. Verify Accuracy of Data
   b. Documenting Overt Evidence of Disparate Treatment
   c. Transactional Underwriting Analysis – Residential and Consumer Loans
   d. Analyzing Potential Disparities in Pricing and Other Terms and Conditions
   e. Steering Analysis
   f. Transactional Underwriting Analysis – Commercial Loans
   g. Analysis of Potential Discriminatory "Redlining"
   h. Analysis of Potential Discriminatory Marketing Practices

4. Part IV – Obtaining and Evaluating Responses from the Institution and Concluding the Examination
   a. Present all findings for explanations
   b. Document all responses provided by the institution, not just its "best" or "final" response

Compliance Program Discrimination Risk Factors

C1. Overall institution compliance record is weak
C2. Prohibited basis monitoring information required by applicable laws and regulations is nonexistent or incomplete
C3. Data and/or recordkeeping problems compromised reliability of previous examination reviews
C4. Fair lending problems were previously found in one or more of the institution's products or in the institution's subsidiaries
C5. The size, scope, and quality of the compliance management program, including senior management's involvement, designation of a compliance officer, and staffing is materially inferior to programs customarily found in institutions of similar size, market demographics and credit complexity
C6. The institution has not updated compliance policies and procedures to reflect changes in law or in agency guidance
C7. Fair lending training is nonexistent or weak

Underwriting Risk Factors

The asterisk below means: *"…examiners need not attempt to calculate the indicated ratios for racial or national origin characteristics when the institution is not a HMDA reporter. However, consideration should be given in such cases to whether or not such calculations should be made based on gender or racial-ethnic surrogates."*

U1. ***Substantial disparities among the approval/denial rates** for applicants by monitored prohibited basis characteristic (especially within income categories)
U2. ***Substantial disparities among the application processing times** for applicants by monitored prohibited basis characteristic (especially within denial reason groups)
U3. ***Substantially higher proportion of withdrawn/incomplete applications** from prohibited basis group applicants than from other applicants
U4. Vague or unduly subjective underwriting criteria
U5. Lack of clear guidance on making exceptions to underwriting criteria, including credit scoring overrides
U6. Lack of clear loan file documentation regarding reasons for any exceptions to standard underwriting criteria, including credit scoring overrides
U7. **Relatively high percentages** of either exceptions to underwriting criteria or overrides of credit score cutoffs
U8. Loan officer or broker compensation based on loan volume (especially loans approved per period of time)
U9. Consumer complaints alleging discrimination in loan processing or in approving/denying residential loans

Pricing Risk Factors

P1. Financial incentives for loan officers or brokers to charge higher prices (including interest rate, fees and points). Special attention should be given to situations where financial incentives are accompanied by broad pricing discretion (as in P2), such as through the use of overages or yield spread premiums

P2. Presence of broad discretion in loan pricing (including interest rate, fees and points), such as through overages, underages or yield spread premiums. Such discretion may be present even when institutions provide rate sheets and fees schedules, if loan officers or brokers are permitted to deviate from those rates and fees without clear and objective criteria

P3. Use of risk-based pricing that is not based on objective criteria or applied consistently

P4. ***Substantial disparities among prices being quoted or charged** to applicants who differ as to their monitored prohibited basis characteristics

P5. Consumer complaints alleging discrimination in residential loan pricing

P6. ***In mortgage pricing, disparities in the incidence or rate spreads of higher-priced lending** by prohibited basis characteristics as reported in the HMDA data

P7. *A loan program that contains only borrowers from a prohibited basis group, or has significant differences in the percentages of prohibited basis groups, especially in the absence of a Special Purpose Credit Program under ECOA

Steering Risk Factors

S1. Lack of clear, objective and consistently implemented standards for (i) referring applicants to subsidiaries, affiliates, or lending channels within the institution (ii) classifying applicants as "prime" or "sub-prime" borrowers, or (iii) deciding what kinds of alternative loan products should be offered or recommended to applicants (product placement)

S2. Financial incentives for loan officers or brokers to place applicants in nontraditional products (e.g., negative amortization, "interest only", "payment option" adjustable rate mortgages) or higher cost products

S3. For an institution that offers different products based on credit risk levels, any significant differences in percentages of prohibited basis groups in each of the alternative loan product categories

S4. ***Significant differences in the percentage of prohibited basis applicants in loan products or products** with specific features relative to control group applicants. Special attention should be given to products and features that have potentially negative consequences for applicants (e.g., non-traditional mortgages, prepayment penalties, lack of escrow requirements, or credit life insurance)

S5. *For an institution that has one or more sub-prime mortgage subsidiaries or affiliates, any significant differences, by loan product, in the percentage of prohibited basis applicants of the institution compared to the percentage of prohibited basis applicants of the subsidiary(ies) or affiliate(s)

S6. *For an institution that has one or more lending channels that originate the same loan product, any significant differences in the percentage of prohibited basis applicants in one of the lending channels compared to the percentage of prohibited basis applicants of the other lending channel

S7. Consumer complaints alleging discrimination in residential loan pricing or product placement

S8. *For an institution with sub-prime mortgage subsidiaries, a concentration of those subsidiaries' branches in minority areas relative to its other branches

Redlining Risk Factors

R1. ***Significant differences, as revealed in HMDA data, in the number of applications received, withdrawn, approved not accepted, and closed for incompleteness** or loans originated in those areas in the institution's market that have relatively high concentrations of minority group residents compared with areas with relatively low concentrations of minority residents

R2. ***Significant differences between approval/denial rates** for all applicants (minority and non-minority) in areas with relatively high concentrations of minority group residents compared with areas with relatively low concentrations of minority residents

R3. ***Significant differences between denial rates based on insufficient collateral** for applicants from areas with relatively high concentrations of minority residents and those areas with relatively low concentrations of minority residents

R4. * **Significant differences in the number of originations of higher-priced loans** or loans with potentially negative consequences for borrowers, (e.g., non-traditional mortgages, prepayment penalties, lack of escrow requirements) in areas with relatively high concentrations of minority residents compared with areas with relatively low concentrations of minority residents

R5. Other patterns of lending identified during the most recent CRA examination that differ by the concentration of minority residents

R6. Explicit demarcation of credit product markets that excludes MSAs, political subdivisions, census tracts, or other geographic areas within the institution's lending market or CRA assessment areas and having relatively high concentrations of minority residents

R7. Difference in services available or hours of operation at branch offices located in areas with concentrations of minority residents when compared to branch offices located in areas with concentrations of non-minority residents

R8. Policies on receipt and processing of applications, pricing, conditions, or appraisals and valuation, or on any other aspect of providing residential credit that vary between areas with relatively high concentrations of minority residents and those areas with relatively low concentrations of minority residents

R9. The institution’s CRA assessment area appears to have been drawn to exclude areas with relatively high concentrations of minority residents

R10. Employee statements that reflect an aversion to doing business in areas with relatively high concentrations of minority residents

R11. Complaints or other allegations by consumers or community representatives that the institution excludes or restricts access to credit for areas with relatively high concentrations of minority residents. Examiners should review complaints against the institution filed either with their agency or the institution; the CRA public comment file; community contact forms; and the responses to questions about redlining, discrimination, and discouragement of applications, and about meeting the needs of racial or national origin minorities, asked as part of obtaining local perspectives on the performance of financial institutions during prior CRA examinations

R12. An institution that has most of its branches in predominantly non-minority neighborhoods at the same time that the institution's sub-prime mortgage subsidiary has branches which are located primarily in predominantly minority neighborhoods

Marketing Risk Factors

M1. Advertising patterns or practices that a reasonable person would believe indicate prohibited basis customers are less desirable
M2. Advertising only in media serving non-minority areas of the market
M3. Marketing through brokers or other agents that the institution knows (or has reason to know) would serve only one racial or ethnic group in the market
M4. Use of marketing programs or procedures for residential loan products that exclude one or more regions or geographies within the institutions assessment or marketing area that have significantly higher percentages of minority group residents than does the remainder of the assessment or marketing area
M5. Using mailing or other distribution lists or other marketing techniques for pre-screened or other offerings of residential loan products that:
- exclude groups of prospective borrowers on a prohibited basis; or
- exclude geographies (e.g., census tracts, ZIP codes, etc.) within the institution's marketing area that have significantly higher percentages of minority group residents than does the remainder of the marketing area

M6. ***Proportion of prohibited basis applicants is significantly lower** than that group's representation in the total population of the market area
M7. Consumer complaints alleging discrimination in advertising or marketing loans

Introduction to Statistics

Several of the Risk Factors listed above have wording such as "substantial disparities", "proportion is significantly lower", "significant differences in the number of" or "substantially higher proportion of"; however, **there is no place in the examination procedures where those words are actually defined.**

There are many methods that could be used to determine significance, but the ones discussed most often are "Benchmarks", "Odds Ratios" and "Statistical Significance".

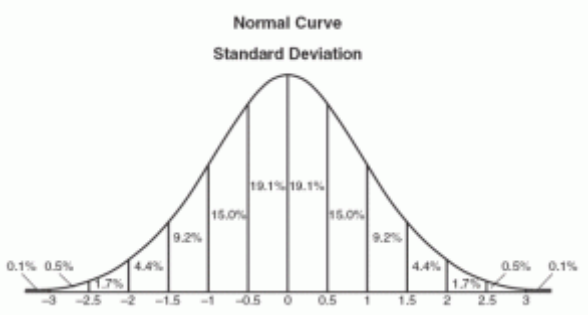
Benchmarks – Setting an arbitrary ratio of one group's proportion to another group's proportion, above which the difference becomes "significant". Based on the user's data set, ratios may need to be adjusted to be worthwhile. Examples are provided below to assist in understanding the use of ratios.

- Smaller volumes tend to give larger ratios, while larger volumes tend to give smaller ratios
  - Example # 1:
    - 500 White applicants with a denial rate of 10%
    - 20 Black applicants with a denial rate of 23%
    - Ratio of Black denials to white denials is 23% divided by 10%, or 2.3 to 1
    - IS THIS RATIO STATISTICALLY SIGNIFICANT? **No**
  - Example #2:
    - 10,000 White applicants with a denial rate of 30%
    - 3,000 Black applicants with a denial rate of 32%
    - Ratio of Black denials to white denials is 32% divided by 30%, or 1.07 to 1
    - IS THIS RATIO STATISTICALLY SIGNIFICANT? **Yes**
- Benchmarks are one way to look at whether something seems significant, but ratios should not be a stand-alone methodology

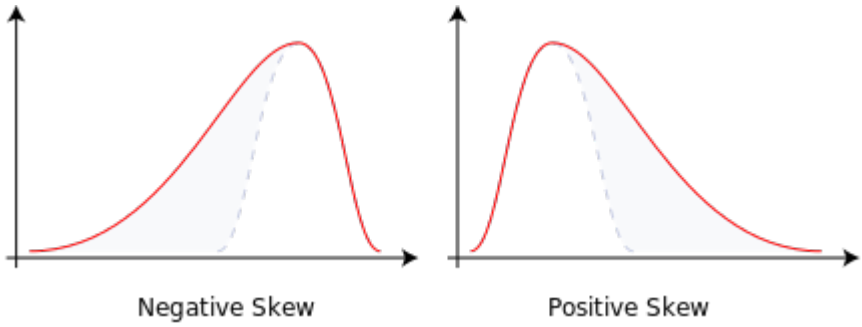
STATISTICAL TERMS:

- **Average** (or **Mean**) = calculated by adding all the numbers together and dividing by the number represented
- **Median** value = with all values laid out in order, the median is the middle point in the list
- **Mode** = the most frequently occurring value found in the list of numbers under review. If there were no values appearing more often than any other, the mode would be 0
- **Standard Deviation** (SD) = the measure of the average distance between all the data values and the mean. Once the average is known, the standard deviation indicates how closely the data points fall around the average
- **Normal Distribution** = A bell-shaped, symmetrical frequency distribution curve. In a normal distribution, extremely large values and extremely small values are rare, and occur near the "tail" ends. Most frequent values are clustered around the mean and fall off smoothly on either side of the mean
  - In a normal distribution, 68% of all values lie within one standard deviation, 95.45% lie within two standard deviations, and 99.8% lie within 3 standard deviations

- Here's an example of a normal distribution curve:



- **Skewed Distribution** = the opposite of a normal distribution, where the data is not symmetrical on both sides of the mean



- **T-statistic** (aka t-test, t-stat, test statistic) = a t-statistic is a calculation which measures the relative distance of a data point from the mean of the sample or population. The t-stat is calculating the number of standard deviations the data point is from the mean. The greater the value of the t-stat, the less likely the difference occurred by chance. **If the value of the t-stat is 1.96 or greater**, then it is considered statistically different from the mean
- **Null Hypothesis** – in statistics, you are testing a hypothesis to see whether it is true or not. In Fair Lending, the "null hypothesis" could be something like "We treat all applicants the same – there is no difference in treatment between any two groups." In the statistical world, the null hypothesis is taken for granted until the alternative is proven true. The null hypothesis is never proven true; you simply fail to reject it
- **Confidence Level** (aka **Significance Level)** – the confidence level used in fair lending is 95% (0.95 on a scale from 0 to 1). In general, a confidence level of 95% means that there is a probability of at least 95% that the results are reliable. The confidence level plus the chosen p-value must equal 1 (0.95 + 0.05 = 1)
  - A confidence level of 95% (0.95) directly corresponds to a t-stat of 1.96

STATISTICALLY SIGNIFICANT – After calculating the average (or mean) for two groups, the standard deviation of the item reviewed (credit score, debt ratio, CLTV ratio, etc.) for the same groups and the population sizes of two groups, you can calculate whether two groups of individuals were statistically different or not

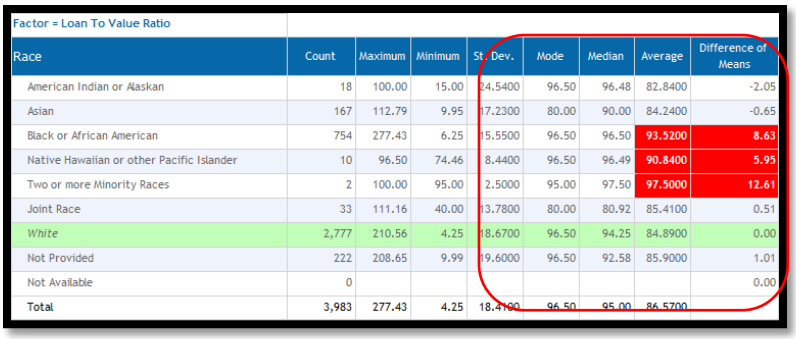
- ✓ Typically, you should have at least 25 people in the "majority" group and at least 5 in the "minority" group to calculate statistical significance. If you have less than 25/5 in the two groups, statistics can become "unreliable"

Examples of Statistics Use in Fair Lending *Wiz*:

- Data Quality Report:

Cust_credt	Count	Maximum	Minimum	Standard Deviation	Mode	Median	Average
Total							
Total	3,983	825.00	576.00	55.65	0.00	717.00	695.12

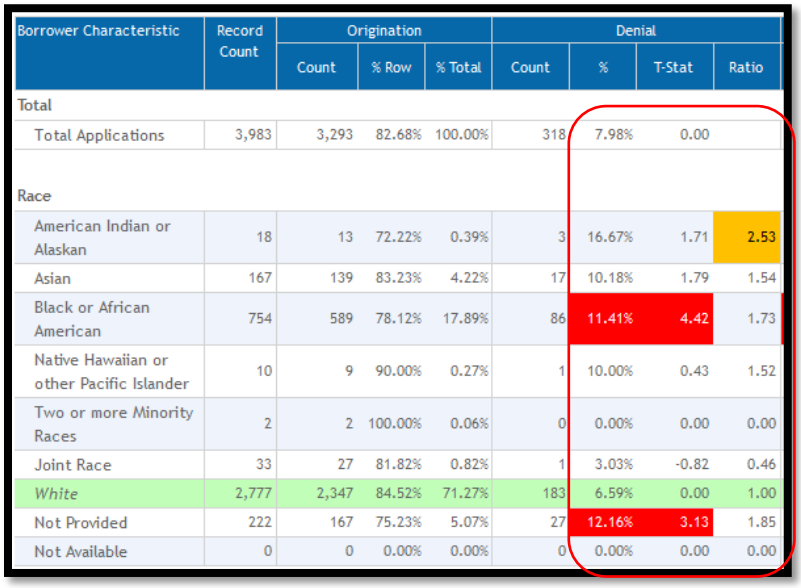
- Difference of Means Report:



Factor = Loan To Value Ratio

Race	Count	Maximum	Minimum	St. Dev.	Mode	Median	Average	Difference of Means
American Indian or Alaskan	18	100.00	15.00	24.5400	96.50	96.48	82.8400	-2.05
Asian	167	112.79	9.95	17.2300	80.00	90.00	84.2400	-0.65
Black or African American	754	277.43	6.25	15.5500	96.50	96.50	93.5200	8.63
Native Hawaiian or other Pacific Islander	10	96.50	74.46	8.4400	96.50	96.49	90.8400	5.95
Two or more Minority Races	2	100.00	95.00	2.5000	95.00	97.50	97.5000	12.61
Joint Race	33	111.16	40.00	13.7800	80.00	80.92	85.4100	0.51
White	2,777	210.56	4.25	18.6700	96.50	94.25	84.8900	0.00
Not Provided	222	208.65	9.99	19.6000	96.50	92.58	85.9000	1.01
Not Available	0							0.00
Total	3,983	277.43	4.25	18.4100	96.50	95.00	86.5700	

- Focal Point Report:



Borrower Characteristic	Record Count	Origination			Denial			
		Count	% Row	% Total	Count	%	T-Stat	Ratio
Total								
Total Applications	3,983	3,293	82.68%	100.00%	318	7.98%	0.00	
Race								
American Indian or Alaskan	18	13	72.22%	0.39%	3	16.67%	1.71	2.53
Asian	167	139	83.23%	4.22%	17	10.18%	1.79	1.54
Black or African American	754	589	78.12%	17.89%	86	11.41%	4.42	1.73
Native Hawaiian or other Pacific Islander	10	9	90.00%	0.27%	1	10.00%	0.43	1.52
Two or more Minority Races	2	2	100.00%	0.06%	0	0.00%	0.00	0.00
Joint Race	33	27	81.82%	0.82%	1	3.03%	-0.82	0.46
White	2,777	2,347	84.52%	71.27%	183	6.59%	0.00	1.00
Not Provided	222	167	75.23%	5.07%	27	12.16%	3.13	1.85
Not Available	0	0	0.00%	0.00%	0	0.00%	0.00	0.00

Chapter 8 – Custom Tables

Getting to Know Your Data

Before starting any type of analysis, you should thoroughly understand the data that you have to work with.

Review the data and understand what is contianed within the data set. Consider some of the following:

If you are a mortgage lender:

- ✓ Do you make non-conventional loans (such as FHA, VA, Farm Service Agency, Rural Housing Service)?
- ✓ If you do make non-conventional loans, what proportion of applications/loans is in those products?
- ✓ Do you place non-saleable loans in your portfolio? If so, is the interest rate higher?
- ✓ Do you consider applications for junior liens or HELOCs?
- ✓ Do you consider applications only for 1-4 family dwellings, or do you consider manufactured homes?
- ✓ Do you consider applications for non-owner occupied loans? If so, is the price different for second homes than it is for investment properties?
- ✓ Do you follow Fannie/Freddie guidelines for loan-level price adjustments (LLPAs)?
- ✓ What other types of adjustments do you make to pricing?
- ✓ If you involve brokers in your process, which brokers bring the highest risk to you as an organization?

If you are a consumer/auto lender:

- ✓ How many product categories do you have classified as "consumer" applications?
- ✓ Do make indirect loans, as well as direct?
- ✓ If you make indirect loans (such as auto finance loans), which dealers bring the highest risk to you as an organization?
- ✓ How are prices determined for each of the products? Can you prove to an outsider that the price adjustments work as expected?

If you are a small business/commercial lender::

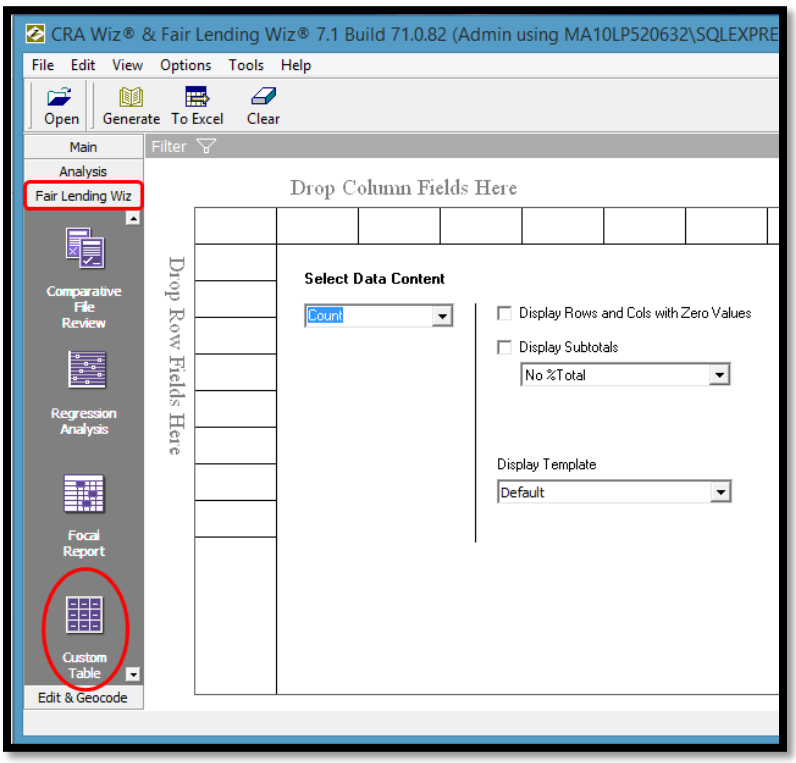
- ✓ What types of small business applications do you consider?
- ✓ What elements go into the pricing of a small business loan?

The more of these questions that you have the answers for before starting the fair lending analysis, the better the analysis will be.

Custom tables can help provide some basic understanding of the application records under review.

Obtaining a Distribution of Applications by Type and Purpose

1. Install or select the file you would like to analyze. For this example, **Training File 2 Final FPR 2018.dat**, and update calculated fields
2. Click on the **Fair Lending *Wiz*** button
3. Click the **Custom Table** button

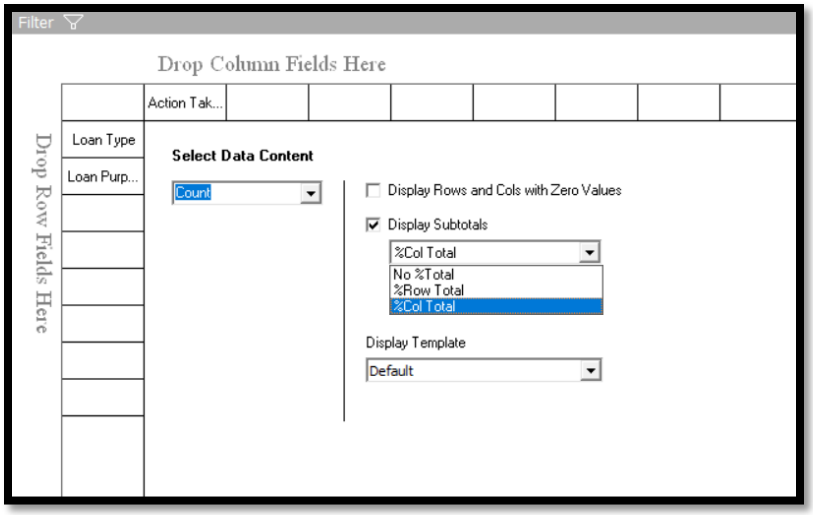


4. On the right side, **double-click** the **Loan Information** folder

- There are <u>two ways</u> to move a field into the custom table:
  - Click and drag
  - Right-click and select "Send to Row" or "Send to column"

5. **Click and drag Action Taken** into any empty column
6. Right-click on **Loan Type**, right-click and select **Send to Row**
7. Right-click and send **Loan Purpose to Row**

8. Under the option labeled Display Subtotals, click the **drop-down arrow** and select **%Col Total**
9. In the Toolbar, click **Generate,** or in this case, **To Excel** button

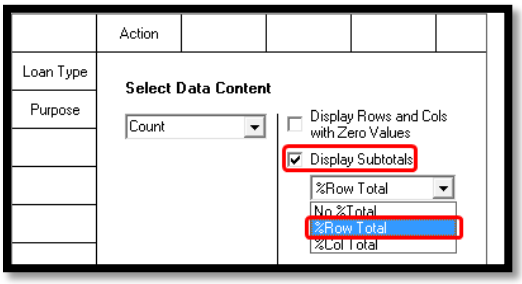


10. **Review results**: Percentages of Applications Received – Conventional 50.49%, FHA 39.39%, VA 5.55%, FSA/RHS 4.57% (Highlighting added for visual effect)

			Action Taken				
Loan Type	**Loan Purpose**	**Data**	**Originated**	**Approved Not Accepted**	**Denied**	**Withdrawn**	**Grand Total**
Conventional	Home Purchase	Count	1225	7	66	129	1427
		%Col of Count	37.20%	70.00%	20.75%	35.64%	35.83%
	Home Improvement	Count	14		2		16
		%Col of Count	0.43%	0.00%	0.63%	0.00%	0.40%
	Refinancing	Count	207		38	34	279
		%Col of Count	6.29%	0.00%	11.95%	9.39%	7.00%
	Cash-out Refinance	Count	185	1	36	15	237
		%Col of Count	5.62%	10.00%	11.32%	4.14%	5.95%
	Other	Count	45		4	3	52
		%Col of Count	1.37%	0.00%	1.26%	0.83%	1.31%
Conventional Count			1676	8	146	181	2011
Conventional %Col of Count			50.90%	80.00%	45.91%	50.00%	50.49%
FHA	Home Purchase	Count	1225	2	115	139	1481
		%Col of Count	37.20%	20.00%	36.16%	38.40%	37.18%
	Refinancing	Count	46		18	5	69
		%Col of Count	1.40%	0.00%	5.66%	1.38%	1.73%
	Cash-out Refinance	Count	14		4	1	19
		%Col of Count	0.43%	0.00%	1.26%	0.28%	0.48%
FHA Count			1285	2	137	145	1569
FHA %Col of Count			39.02%	20.00%	43.08%	40.06%	39.39%
VA	Home Purchase	Count	175		14	15	204
		%Col of Count	5.31%	0.00%	4.40%	4.14%	5.12%
	Refinancing	Count	3		6	4	13
		%Col of Count	0.09%	0.00%	1.89%	1.10%	0.33%
	Cash-out Refinance	Count	2		1	1	4
		%Col of Count	0.06%	0.00%	0.31%	0.28%	0.10%
VA Count			180		21	20	221
VA %Col of Count			5.47%	0.00%	6.60%	5.52%	5.55%
FSA/RHS	Home Purchase	Count	152		14	16	182
		%Col of Count	4.62%	0.00%	4.40%	4.42%	4.57%
FSA/RHS Count			152		14	16	182
FSA/RHS %Col of Count			4.62%	0.00%	4.40%	4.42%	4.57%
Total Count			3293	10	318	362	3983
Total %Col of Count			100.00%	100.00%	100.00%	100.00%	100.00%

Go back to Custom Tables, keep the same information, but for this example, perform the following:

11. Click the drop-down arrow for **Display Subtotals**
    a. Change to **%Row Total**
12. **I**n the Toolbar, click **To Excel**

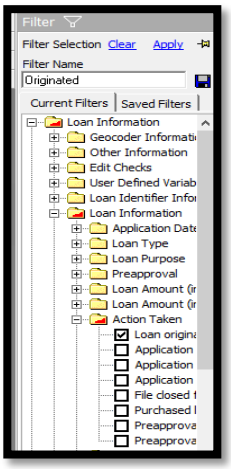


13. **Review results**: The options selected show the Origination Rate and Denial Rate for each category and sub-category
    a. Overall denial rate (7.98%) is low
    b. VA Refinances have the highest denial rate (46.15%)
    c. FHA Refinances have the next highest (26.09%)

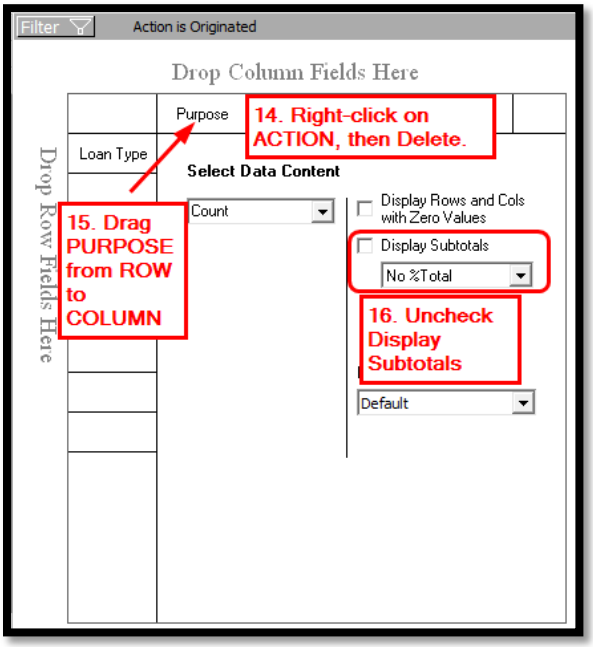
			Action Taken				
Loan Type	Loan Purpose	Data	Originated	Approved NA	Denied	Withdrawn	Grand Total
Conventional	Home Purchase	Count	1225	7	66	129	1427
		%Row of Count	85.84%	0.49%	4.63%	9.04%	100.00%
	Home Improvement	Count	14		2		16
		%Row of Count	87.50%	0.00%	12.50%	0.00%	100.00%
	Refinancing	Count	207		38	34	279
		%Row of Count	74.19%	0.00%	13.62%	12.19%	100.00%
	Cash-out Refinance	Count	185	1	36	15	237
		%Row of Count	78.06%	0.42%	15.19%	6.33%	100.00%
	Other	Count	45		4	3	52
		%Row of Count	86.54%	0.00%	7.69%	5.77%	100.00%
Conventional Count			1676	8	146	181	2011
Conventional %Row of Count			83.34%	0.40%	7.26%	9.00%	100.00%
FHA	Home Purchase	Count	1225	2	115	139	1481
		%Row of Count	82.71%	0.14%	7.77%	9.39%	100.00%
	Refinancing	Count	46		18	5	69
		%Row of Count	66.67%	0.00%	26.09%	7.25%	100.00%
	Cash-out Refinance	Count	14		4	1	19
		%Row of Count	73.68%	0.00%	21.05%	5.26%	100.00%
FHA Count			1285	2	137	145	1569
FHA %Row of Count			81.90%	0.13%	8.73%	9.24%	100.00%
VA	Home Purchase	Count	175		14	15	204
		%Row of Count	85.78%	0.00%	6.86%	7.35%	100.00%
	Refinancing	Count	3		6	4	13
		%Row of Count	23.08%	0.00%	46.15%	30.77%	100.00%
	Cash-out Refinance	Count	2		1	1	4
		%Row of Count	50.00%	0.00%	25.00%	25.00%	100.00%
VA Count			180		21	20	221
VA %Row of Count			81.45%	0.00%	9.50%	9.05%	100.00%
FSA/RHS	Home Purchase	Count	152		14	16	182
		%Row of Count	83.52%	0.00%	7.69%	8.79%	100.00%
FSA/RHS Count			152		14	16	182
FSA/RHS %Row of Count			83.52%	0.00%	7.69%	8.79%	100.00%
Total Count			3293	10	318	362	3983
Total %Row of Count			82.68%	0.25%	7.98%	9.09%	100.00%

Next, for this example we will add a filter to the file. To do so, return to Custom Tables and perform the following:

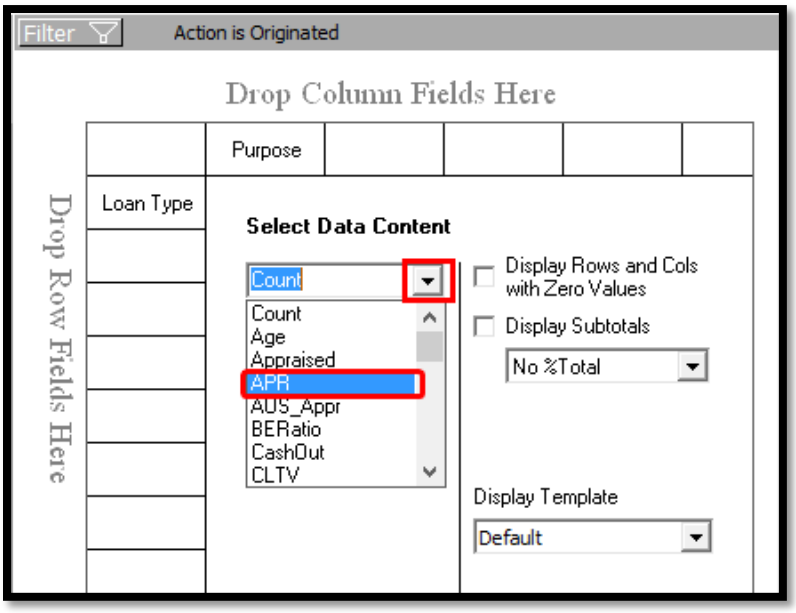
14. Click on **Filter**
    a. Open **Loan Information**
    b. Open **Loan Information**
    c. Open **Action**
    d. Select **Originated**
    e. To SAVE this filter for later use, type "**Originated**" in the **Filter Name** text box
    f. Click the **Save** button
        i. Click **OK** after Save
    g. Click **Apply**



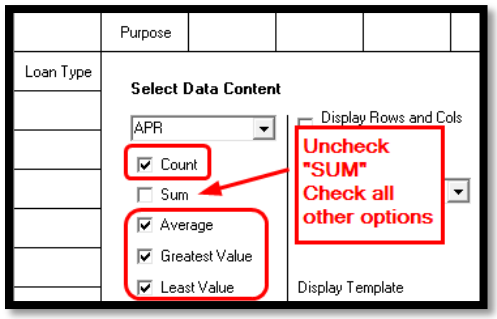
15. **Right-click on Action** (in the Column header)
    a. Select **Delete**
16. **Drag Loan Purpose** into the first empty column
17. **Uncheck** Display Subtotals



18. Click the "Select Data Content" drop-down arrow and select **APR** from the list of fields



19. After selecting APR, **uncheck SUM** and **check Count, Average, Greatest Value, Least Value**
20. In the Toolbar, click **To Excel**



21. **Review Results**: The overall average for the portfolio is 4.50%
    a. Home Purchase loans are the most expensive (4.74% compared to Other 4.18% or Refinances 4.26%)
    b. FHA loans cost an average of 57 basis points more than conventional

Training File 2 Final FPR 2018

Active Filters

Action Taken is Loan originated

		Loan Purpos					
Loan Type	Data	Home Purchase	Home Improvement	Refinancing	Cash-out Refinance	Other	Grand Total
Conventional	Count	1225	14	207	185	45	1676
	Avg of APR	4.66	4.39	4.12	4.21	4.18	4.31
	Max of APR	10.2	5.32	6.11	7.81	6.74	10.2
	Min of APR	2.71	3.31	2.84	2.89	2.83	2.71
FHA	Count	1225		46	14		1285
	Avg of APR	5.09		4.66	4.90		4.88
	Max of APR	6.62		5.61	5.31		6.62
	Min of APR	2.87		2.98	4.08		2.87
VA	Count	175		3	2		180
	Avg of APR	4.44		3.99	4.64		4.36
	Max of APR	5.5		4.57	5.06		5.5
	Min of APR	2.68		3.27	4.21		2.68
FSA/RHS	Count	152					152
	Avg of APR	4.76					4.76
	Max of APR	5.37					5.37
	Min of APR	4.05					4.05
Total Count		2777	14	256	201	45	3293
Total Avg of APR		4.74	4.39	4.26	4.58	4.18	4.50
Total Max of APR		10.2	5.32	6.11	7.81	6.74	10.2
Total Min of APR		2.68	3.31	2.84	2.89	2.83	2.68

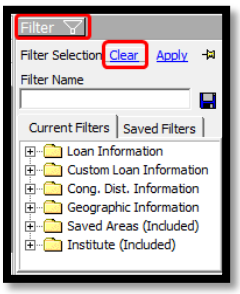
Understanding the Values Behind HMDA Codes

As mentioned on the introductory page to this chapter, there are facts about your data that you should know before starting your analysis. HMDA codes specify things like Occupancy Type, Construction Method, Lien Status, HOEPA Status, Rate Types, and others.

Before starting a fair lending analysis, you should know what is behind these fields. For example, Construction Method has two available codes: Code 1: Site-built 2: Manufactured Housing. Generally speaking, applications for Manufactured homes are denied more frequently and are priced higher when originated. Therefore, when conducting fair lending analysis, regression in particular, applications with code 2 should indicate a higher denial rate and a higher price compared to Code 1.

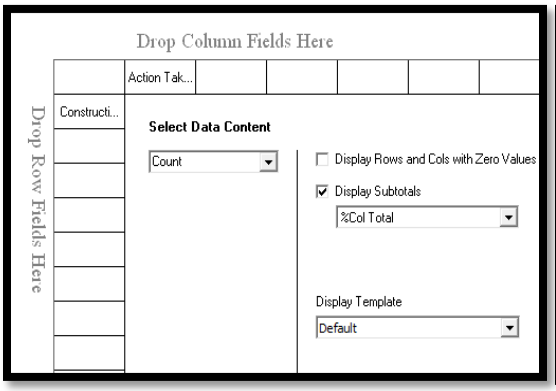
To determine if the assumption above is correct:

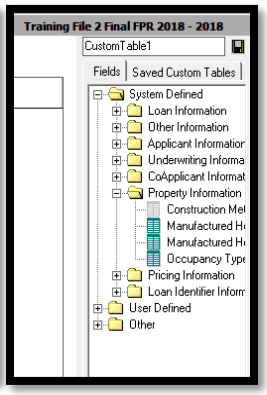
1. Click on **Filter** then **Clear**



Click on the **Custom Table button** to reset all settings

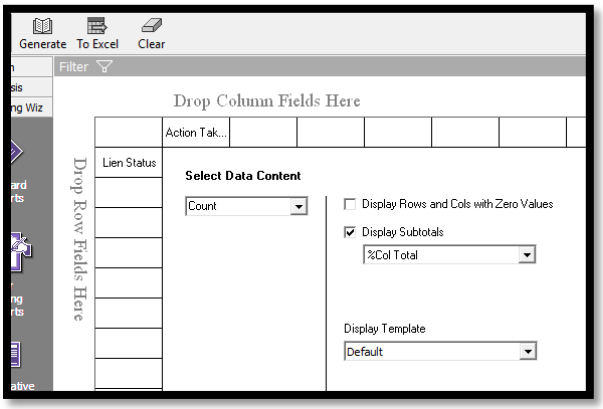
a. Drag **Action to COLUMN**
b. Drag **Construction Method to ROW**
c. Set Display Subtotals **to %Col Total**
d. Send **To Excel**
e. **Results**: 99.% Site Built and 1% Manufactured Home





1	Training File 2 2018						
2							
3	Active Filters						
4	None						
5							
6			Action Taken				
7	Construction Method	Data	Loan originated	Application Approved but not accepted	Application denied	Application withdrawn by applicant	Grand Total
8	Site built (modular or prefabrication)	Count	3262	10	316	355	3943
9		%Col of Count	99.06%	100.00%	99.37%	98.07%	99.00%
10	Manufactured housing	Count	31		2	7	40
11		%Col of Count	0.94%	0.00%	0.63%	1.93%	1.00%
12	Total Count		3293	10	318	362	3983
13	Total %Col of Count		100.00%	100.00%	100.00%	100.00%	100.00%

2. Right-click on **Lien Status** and **Send to Row**
   a. Right-click on **Construction Method** and **Delete**
   b. Send **To Excel**
   c. **Results**: There are 75 subordinate liens representing 1.88% of total applications



Training File 2 2018

Active Filters

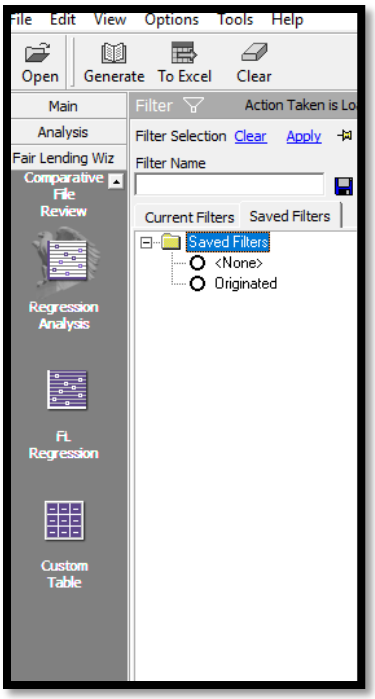
None

		Action Taken				
Lien Status	Data	Loan originated	Application Approved but not accepted	Application denied	Application withdrawn by applicant	Grand Total
Secured by a First Lien	Count	3226	10	314	358	3908
	%Col of Count	97.97%	100.00%	98.74%	98.90%	98.12%
Secured by a Subordinate Lien	Count	67		4	4	75
	%Col of Count	2.03%	0.00%	1.26%	1.10%	1.88%
Total Count		3293	10	318	362	3983
Total %Col of Count		100.00%	100.00%	100.00%	100.00%	100.00%

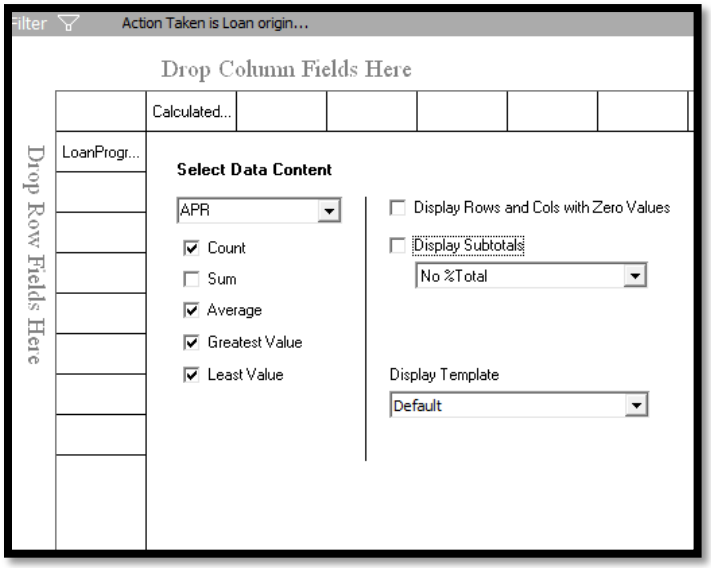
Calculating Average APRs for All Loan Products

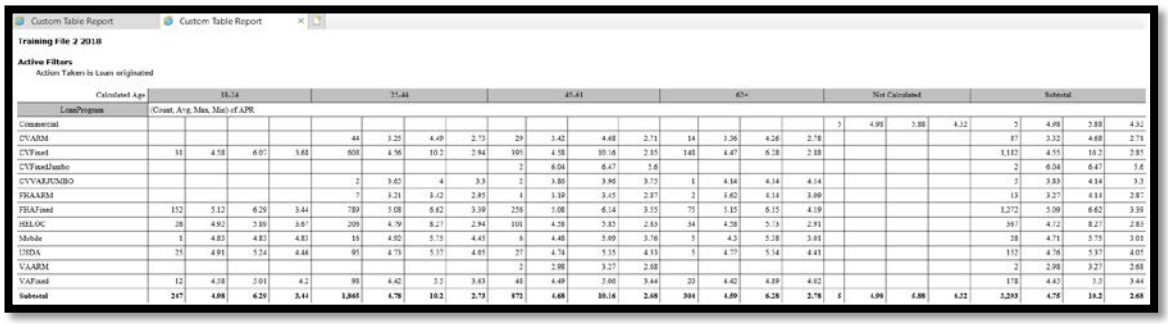
To determine if some products carry more fair lending risk, such as higher prices on average for certain prohibited-basis groups, consider creating a custom table similar to the one below.

1. Click the **Custom Table** button to reset all
2. Click **Filter**
   a. **Saved Filters**
   b. **Double-click** the folder to open
   c. Select **Originated**
   d. Click **Apply**



3. Complete the Custom Table, as follows:
   a. Double-click the **Applicant Information** folder
   b. Right-click Calculated **Age** and **Send to Column**
   c. **Double-click** the **Other** folder
   d. Type **loanp** (the first five letters of LoanProgram), **or scroll down** to find LoanProgram
   e. Right-click **LoanProgram** and **Send to Row**
   f. Click the drop-down arrow for **Select Data Content**; select **APR**
   g. **Check Count**, **Average**, **Greatest Value**, **Least Value** and **uncheck Sum**
   h. Click **Generate** or **To Excel**
      i. Additional formatting or analysis can be done in Excel, if desired





Suggestions:

- Custom tables can be saved by typing in a name in the textbox supplied (overwrite CustomTable1) with a descriptive name
- Add APPLNUMB (application number) in as a ROW to see the applications taken in each category (of loans, minority tracts, assessment areas [Analysis > Create Areas > Assign Areas to a File to make the file "aware" of the Assessment Area designations], or anything else that may be helpful
  - Adding anything more than 10 to 30 columns, such as Application Number, is not easy to understand
- Switch things around using Excel's Pivot Table features
  - Change the order of multiple Rows by dragging the Lower field above the higher field
  - Change the description of the field (right click on the field name in the Pivot Table Field List for options)
- Possible custom tables:
  - ROW = Loan Term; COL = Actions; SUBTOTAL OPTION both %Row & %Column
  - ROW = Dealer_Name; COL = RaceEth (or Race, Ethnicity, Sex, Age); SUBTOTAL OPTION %Row
  - ROW = Marital_Status; COL = Actions; SUBTOTAL OPTION both %Row & %Column
  - ROW = RateType; COL = Actions; SUBTOTAL OPTIOIN both %Row & %Column
  - BISG Proxy: ROW = RaceEth; COLUMN = Race, Ethnicity; SUBTOTAL OPTION both %Row & %Column

Chapter 9 – Risk Reports

Users should understand the risks that are apparent in the data. Following the Interagency Fair Lending Examination Procedures (see Chapter 8) can help with understanding the risks, and several reports within Fair Lending *Wiz* are designed to help as well.

This chapter will cover the following reports:

- ✓ Underwriting U1 and Pricing Risks P4: **Focal Point Report**
- ✓ Underwriting Risk U2: **Disparities in Processing Times**
- ✓ Underwriting Risk U3: **Proportion of Withdrawn/Incomplete Apps**
- ✓ Pricing Risks P4: **Pricing Disparity Summary**
- ✓ Steering S3: **Proportion of Conventional vs FHA Mortgages**
- ✓ Redlining R1: **Differences in Origination Counts by Minority Concentration**
- ✓ Redlining R2: **Differences in Minority Concentration**
- ✓ Redlining R3: **Differences in Insufficient Collateral by Minority Concentration**
- ✓ Marketing M6: **Redlining and Marketing Scorecard**

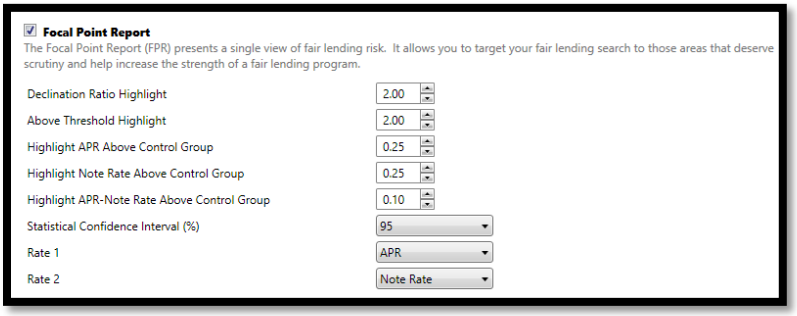
Focal Point Report

This is an ideal report to analyze risks quickly. This report identifies underwriting risks by assessing origination and denial rates, as well as pricing risks by assessing high-priced mortgage loans. The assessments use fields such as average APRs, average Interest Rates and the difference between the APR and Interest Rate (implying fees). The questions in the examination procedures regarding "**Substantial disparities among the approval/denial rates" and "Substantial disparities in prices being quoted or charged"** are covered using two totally separate tests. One is a benchmark test, the other applies statistical calculations to the volumes and differences to calculate t-statistics.

To access the Focal Point Report:

1. Click the **Fair Lending *Wiz*** button (Ensure all filters are removed)
2. Click the **Fair Lending Reports** button

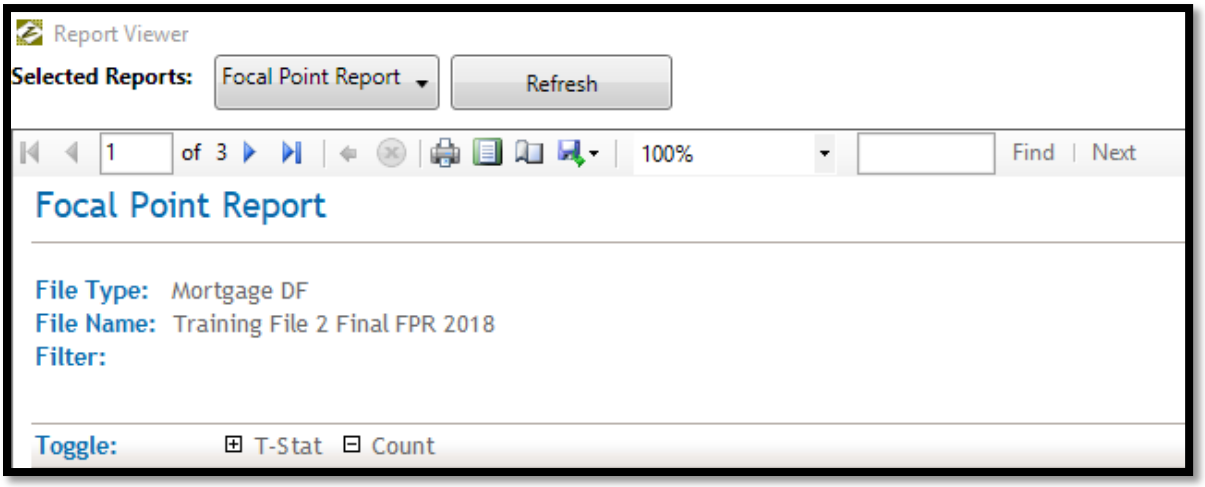
3. Select **Focal Point Report** from the reports list
   a. For now, leave **all benchmark settings at their default values**



   b. For Pricing (Rate 1 and Rate 2), select two rate types to compare (for example, APR and Interest Rate). The system will calculate the difference between the two values. It is important that the factors selected are comparable. For example, comparing total points and fees to APR isn't likely to render valuable results. The options included for Rate 1 and 2 are:
      i. APR
      ii. Interest Rate or Note Rate
      iii. Discount
      iv. Lender Credits
      v. Origination Fees
      vi. Total Loan Costs
      vii. Total Points and Fees
      viii. Buy Rate
      ix. Closing Costs
      x. Fees
      xi. Rate Difference
      xii. Rate Spread
   c. Select **Generate Report**

For future reference, benchmarks can be changed depending upon the type of lending being reviewed. The decision to change benchmarks is optional and would be based on the control group's binomial percentage (denial rate, above threshold rate, etc.).

4. Options**:**
    a. **Selected Reports** drop down list (if multiple reports generated at once, click on the drop-down to see the additional reports)
    b. **Refresh** button - applying filters from the left-most *Wiz* icon changes automatically; if underlying data changes, click Refresh
    c. **Print** icon - takes users to the Windows print dialog box
    d. **Print layout** - shows what the printed page will look like
    e. **Page setup** - allows adjustments to margins and selection of portrait vs. landscape mode
    f. **Export** button - allows export/save to Excel, PDF or Word
    g. **T-Stat** toggle - toggles t-statistic columns on, then off again
    h. **Count** toggle - toggles count columns off, then on again



You can apply various filters to review segments of the data file. For example, you can separate out by loan type, open end/closed end, lien position, occupancy type, and so on.

5. **Review results**: For this example

Borrower Characteristic	Record Count	Origination			Denial			Above Threshold		APR		Interest Rate		APR - Interest Rate	
		Count	% Row	% Total	Count	%	Ratio	Count	Ratio	Average	vs Target	Average	vs Target	Average	vs Target
Total															
Total Applications	3,983	3,293	82.68%	100.00%	318	7.98%		70		4.75		4.30		0.45	
Race															
American Indian or Alaskan	18	13	72.22%	0.39%	3	16.67%	2.52	1	4.50	5.00	0.31	4.57	0.30	0.43	0.02
Asian	167	139	83.23%	4.22%	17	10.18%	1.54	2	0.84	4.55	-0.14	4.19	-0.08	0.35	-0.06
Asian Indian	0	0	0.00%	0.00%	0	0.00%	0.00	0	0.00						
Chinese	0	0	0.00%	0.00%	0	0.00%	0.00	0	0.00						
Filipino	1	1	100.00%	0.03%	0	0.00%	0.00	0	0.00	4.91	0.22	4.50	0.23	0.41	-0.01
Japanese	1	1	100.00%	0.03%	0	0.00%	0.00	0	0.00	4.51	-0.18	3.75	-0.52	0.76	0.34
Korean	0	0	0.00%	0.00%	0	0.00%	0.00	0	0.00						
Vietnamese	0	0	0.00%	0.00%	0	0.00%	0.00	0	0.00						
Other Asian	0	0	0.00%	0.00%	0	0.00%	0.00	0	0.00						
Black or African American	753	588	78.09%	17.86%	86	11.42%	1.73	23	2.29	5.05	0.36	4.43	0.16	0.61	0.20
Native Hawaiian or other Pacific Islander	10	9	90.00%	0.27%	1	10.00%	1.51	0	0.00	4.96	0.27	4.47	0.20	0.49	0.07
Native Hawaiian	0	0	0.00%	0.00%	0	0.00%	0.00	0	0.00						
Guamanian or Chamorro	0	0	0.00%	0.00%	0	0.00%	0.00	0	0.00						
Samoan	0	0	0.00%	0.00%	0	0.00%	0.00	0	0.00						
Other Pacific Islander	0	0	0.00%	0.00%	0	0.00%	0.00	0	0.00						
Two or more Minority Races	2	2	100.00%	0.06%	0	0.00%	0.00	0	0.00	4.72	0.03	4.31	0.04	0.41	-0.01
Joint Race	34	28	82.35%	0.85%	1	2.94%	0.44	0	0.00	4.42	-0.27	4.06	-0.21	0.36	-0.06
White	2,770	2,340	84.48%	71.06%	183	6.61%	1.00	40	1.00	4.69	0.00	4.27	0.00	0.42	0.00
Not Provided	222	167	75.23%	5.07%	27	12.16%	1.84	4	1.40	4.73	0.05	4.33	0.06	0.40	-0.01
Not Applicable	5	5	100.00%	0.15%	0	0.00%	0.00	0	0.00	4.98	0.29	5.28	1.00	(0.30)	-0.71
Not Calculated	0	0	0.00%	0.00%	0	0.00%	0.00	0	0.00						

a. Whites represented 71.06% of originations; American Indian 0.39%; black/African American 17.86%
b. White denial rate 6.61%; American Indian denial rate 16.67%; black denial rate 11.42%
c. **Denial Ratio** American Indian/white = 16.67 / 6.61 = 2.52 (above 2.00 benchmark but **not** statistically significant)
d. **Denial Ratio** black/white = 11.42 / 6.61 = 1.73 **NOT >= 2.00**, but was **Statistically Significant** (red cell)
e. **Above threshold Ratio**: 40 whites out of 2,340 originations (1.71% - becomes 1.00 as control group), compared to blacks 23 out of 588 (3.91%). 3.91 divided by 1.71 = 2.29 ratio. Above 2.00 **benchmark** AND **statistically significant**)
f. **APR Pricing**: Average white APR 4.69%, average black APR 5.05%, for difference of 36 basis points (0.36). Difference was over the 0.25 **benchmark** AND was **statistically significant**
g. **Interest Rate Pricing**: Average white Note Rate 4.27%, average black Note Rate 4.43%, 16 basis points higher. Difference was not over benchmark of 0.25 but was **statistically significant**)
h. **Fees Pricing**: Fees (APR – Note Rate). Whites paid "fees" of 0.42%, blacks paid fees of 0.61%, 20 basis points higher which was over **benchmark** of 10 basis points AND **statistically significant**

6. **Click on t-stat toggle** to show the t-stat column. Remember: any t-stat greater than or equal to 1.96 is statistically significant (2 or more standard deviations higher than average)

Denial				Above Threshold			APR			Interest Rate			APR - Interest Rate		
Count	%	T-Stat	Ratio	Count	T-Stat	Ratio	Average	T-Stat	vs Target	Average	T-Stat	vs Target	Average	T-Stat	vs Target
318	7.98%	0.00		70	0.00		4.75	0.00		4.30	0.00		0.45	0.00	
3	16.67%	1.70	2.52	1	1.64	4.50	5.00	1.60	0.31	4.57	1.86	0.30	0.43	0.15	0.02
17	10.18%	1.78	1.54	2	(0.24)	0.84	4.55	(2.30)	-0.14	4.19	(1.58)	-0.08	0.35	(1.91)	-0.06
0	0.00%	0.00	0.00	0	0.00	0.00		0.00			0.00			0.00	
0	0.00%	0.00	0.00	0	0.00	0.00		0.00			0.00			0.00	
0	0.00%	0.00	0.00	0	0.00	0.00	4.91	0.00	0.22	4.50	0.00	0.23	0.41	0.00	-0.01
0	0.00%	0.00	0.00	0	0.00	0.00	4.51	0.00	-0.18	3.75	0.00	-0.52	0.76	0.00	0.34
0	0.00%	0.00	0.00	0	0.00	0.00		0.00			0.00			0.00	
0	0.00%	0.00	0.00	0	0.00	0.00		0.00			0.00			0.00	
0	0.00%	0.00	0.00	0	0.00	0.00		0.00			0.00			0.00	
86	11.42%	4.41	1.73	23	3.29	2.29	5.05	11.25	0.36	4.43	6.11	0.16	0.61	11.63	0.20
1	10.00%	0.43	1.51	0	(0.40)	0.00	4.96	1.17	0.27	4.47	1.06	0.20	0.49	0.58	0.07
0	0.00%	0.00	0.00	0	0.00	0.00		0.00			0.00			0.00	
0	0.00%	0.00	0.00	0	0.00	0.00		0.00			0.00			0.00	
0	0.00%	0.00	0.00	0	0.00	0.00		0.00			0.00			0.00	
0	0.00%	0.00	0.00	0	0.00	0.00		0.00			0.00			0.00	
0	0.00%	0.00	0.00	0	0.00	0.00	4.72	0.00	0.03	4.31	0.00	0.04	0.41	0.00	-0.01
1	2.94%	-0.86	0.44	0	(0.70)	0.00	4.42	(2.00)	-0.27	4.06	(1.95)	-0.21	0.36	(0.79)	-0.06
183	6.61%	0.00	1.00	40	0.00	1.00	4.69	0.00	0.00	4.27	0.00	0.00	0.42	0.00	0.00
27	12.16%	3.11	1.84	4	0.66	1.40	4.73	0.81	0.05	4.33	1.24	0.06	0.40	(0.38)	-0.01
0	0.00%	-0.59	0.00	0	(0.29)	0.00	4.98	0.93	0.29	5.28	3.96	1.00	(0.30)	(4.28)	-0.71
0	0.00%	0.00	0.00	0	0.00	0.00		0.00			0.00			0.00	

a. Black/White denial ratio of 1.73 times higher – t-statistic was 4.41
b. Black/White Above Threshold ratio of 2.29 – t-statistic was 3.29
c. Black/White APR Difference of 36 basis points – t-statistic was 11.25
d. Black/White Note Rate Difference of 16 basis points – t-statistic was 6.11
e. Black/White Fees Difference of 20 basis points – t-statistic was 11.63

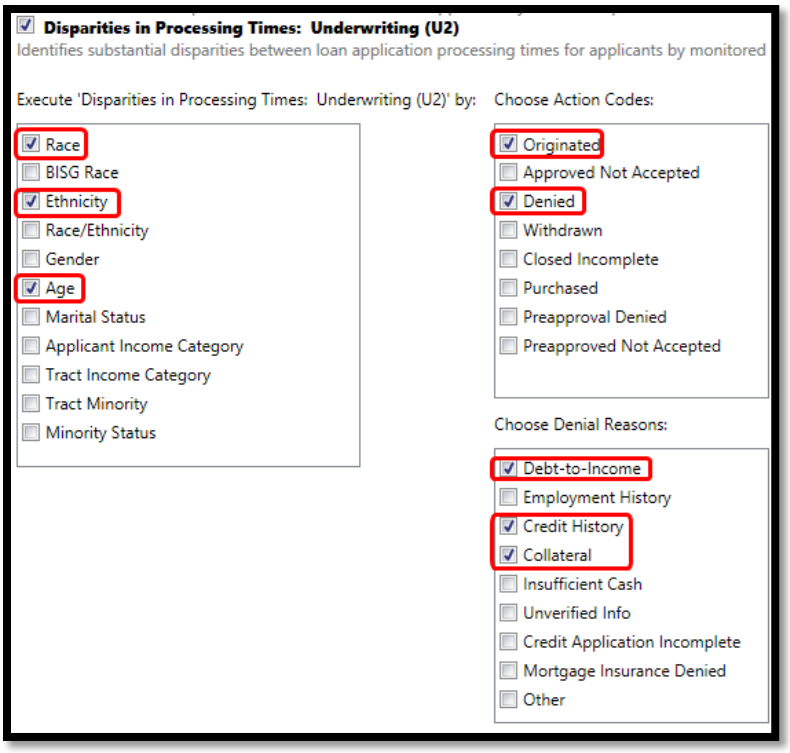
7. **Review remainder** of Focal Point Report, then **click the X to close the report**

Disparities in Processing Times: Underwriting (U2)

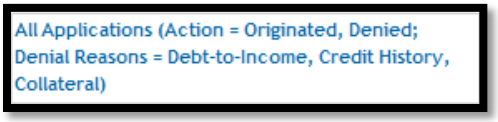
If the application date and action dates are in the file, and are accurate, the software calculates the average time between the two dates.

1. Select **Disparities in Processing Times**: Underwriting (U2) from report menu

    a. For this example only certain selections will be made, but all options can be selected at once. Select the following:
        i. **Race**
        ii. **Ethnicity**
        iii. **Age**
        iv. **Originated**
        v. **Denied**
        vi. **Debt-to-Income**
        vii. **Credit History**
        viii. **Collateral**
    b. Click **Generate Report**.



2. **Pay attention** to the filter box below the report name
3. **Move to Page 2** (using page navigation)



4. **Review Results**:

Action = Loan originated

Race	Count	Maximum	Minimum	St. Dev.	Mode	Median	Average
American Indian or Alaskan	13	73.00	11.00	17.3200	21.00	23.00	31.9200
Asian	139	232.00	8.00	26.1300	23.00	32.00	40.1900
Asian Indian	0						
Chinese	0						
Filipino	1	25.00	25.00	0.0000	25.00	25.00	*25.0000*
Japanese	1	35.00	35.00	0.0000	35.00	35.00	*35.0000*
Korean	0						
Vietnamese	0						
Other Asian	0						
Black or African American	588	245.00	8.00	25.0300	35.00	38.00	43.8000
Native Hawaiian or other Pacific Islander	9	50.00	14.00	12.3700	14.00	25.00	31.1100
Native Hawaiian	0						
Guamanian or Chamorro	0						
Samoan	0						
Other Pacific Islander	0						
White	2,340	398.00	8.00	22.2400	28.00	32.00	37.9600
Two or more Minority Races	2	39.00	32.00	3.5000	32.00	35.50	35.5000
Joint Race	28	116.00	11.00	19.9700	25.00	27.00	34.1800
Not Provided	167	127.00	10.00	19.2100	29.00	30.00	35.2900
Not Applicable	5	38.00	21.00	6.2800	21.00	24.00	*27.4000*
Not Calculated	0						
Total	**3,293**	**398.00**	**8.00**	**22.8500**	**28.00**	**33.00**	**38.8600**

   a. It took 37.96 days for whites, 43.80 days for blacks. The difference was **significantly longer**

5. **Move to Page 3** (All Denial Reasons together)

6. **Review Results:**

Action = Application denied (Denial Reasons = Debt-to-Income, Credit History, Collateral)							
Race	Count	Maximum	Minimum	St. Dev.	Mode	Median	Average
American Indian or Alaskan	3	68.00	21.00	19.9400	21.00	33.00	40.6700
Asian	12	175.00	15.00	48.3300	15.00	29.50	49.8300
Asian Indian	0						
Chinese	0						
Filipino	0						
Japanese	0						
Korean	0						
Vietnamese	0						
Other Asian	0						
Black or African American	74	241.00	1.00	39.0300	26.00	42.00	52.8900
Native Hawaiian or other Pacific Islander	1	19.00	19.00	0.0000	19.00	19.00	*19.0000*
Native Hawaiian	0						
Guamanian or Chamorro	0						
Samoan	0						
Other Pacific Islander	0						
White	151	228.00	0.00	33.8100	14.00	39.00	46.5900
Two or more Minority Races	0						
Joint Race	1	17.00	17.00	0.0000	17.00	17.00	*17.0000*
Not Provided	20	165.00	7.00	38.7600	25.00	44.00	56.3000
Not Applicable	0						
Not Calculated	0						
Total	**262**	**241.00**	**0.00**	**36.5400**	**25.00**	**40.00**	**48.9700**

   a. It took 46.59 days (on average) for white applicants to be denied. Blacks took 52.89 (on average) but the difference was not significantly different
      i. The Minimum and Maximum values for all races
   b. The row for Native Hawaiians implies a significant difference, but there is only 1 person in that group. Statistical results are not considered reliable if the number of people in the "sample" is less than 5. Keep that in mind when reviewing these results
7. **Close the report viewer**
8. **Unselect** Disparities in Processing Times

Proportion of Withdrawn/Incomplete Apps: Underwriting (U3)

Calculates proportions of prohibited-basis groups who received the action codes of withdrawn or incomplete. Higher proportions can be an indication of risk.

1. Select **Proportion of Withdrawn/Incomplete Apps**: **Underwriting (U3)** from the Risk Factor Analysis Reports menu
2. For this example, select
   a. **Race**
   b. **Ethnicity**
   c. **Gender**
   d. **Age**
3. **Generate Report**
   a. Go to Age Results

Age	Total Applications	Withdrawn/Incomplete	Percentage
< 18	0	0	0.00 %
18-24	286	20	7.00 %
25-44	2,251	203	9.00 %
45-61	1,063	92	9.00 %
62 +	378	47	12.00 %
Not Available	5	0	0.00 %
Total	3,983	362	9.09 %

The age sub-groups are aggregated together to form the "Under 62" group. *(20+202+88)/(286+2246+1052))*100=8.65 % compared to 47/378 = 12.43%

4. **Review Results:**
   a. Of all of the groups, only those 62 or older were withdrawn significantly more often. 12% withdrawn compared to 8.65% for those under the age of 62. T-Statistic was over 1.96
5. **Close the report viewer**
6. **Unselect** Proportion of Withdrawn/Incomplete Apps

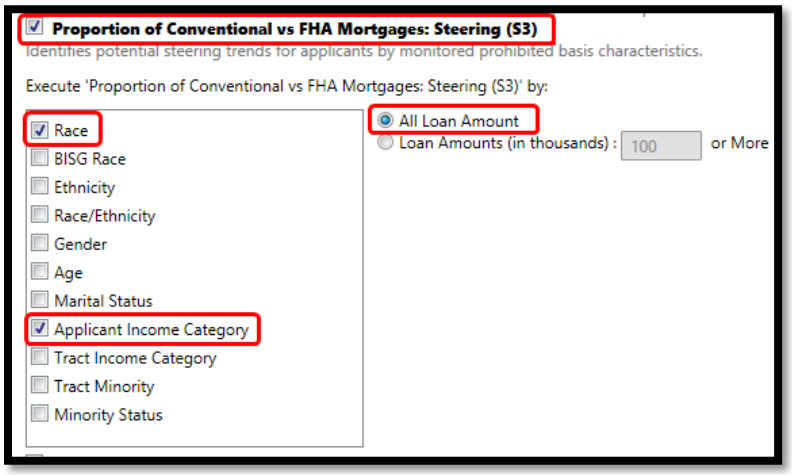
Proportion of Conventional vs FHA Mortgages: Steering (S3)

As identified in the Examination Procedures, FHA loans can be considered a higher-risk product and should be monitored for steering risk due to historically being priced higher than conventional loans.

Since every lending institution is different, monitoring other potential steering issues would necessitate the identification of those considered "more costly, or having potentially negative consequences" in a new binary field. Once identified, a custom table could be used to show who received those products.

Fair Lending *Wiz* can conduct an analysis of steering (FHA to conventional loans) via the Steering Report.

1. Select **Proportion of Conventional vs FHA Mortgages: Steering (S3)** report
   a. For this example we will only select two categories, but all categories can be selected at once
      i. Select **Race**
      ii. **Applicant Income Category**
   b. For this example**,** "All Loan Amounts" will be selected, and the user may choose to show loan amounts in thousands
   c. Click **Generate Report**



2. **Review Results**:

Race	Conventional			FHA			Total	
	Count	Row %	Col %	Count	Row %	Col %	Count	Col %
American Indian or Alaskan	9	50.00 %	0.45 %	7	38.89 %	0.45 %	18	0.45 %
Asian	107	64.07 %	5.32 %	60	35.93 %	3.82 %	167	4.19 %
Asian Indian	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
Chinese	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
Filipino	1	100.00 %	0.05 %	0	0.00 %	0.00 %	1	0.03 %
Japanese	0	0.00 %	0.00 %	1	100.00 %	0.06 %	1	0.03 %
Korean	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
Vietnamese	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
Other Asian	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
Black or African American	204	27.09 %	10.14 %	458	60.82 %	29.19 %	753	18.91 %
Native Hawaiian or other Pacific Islander	5	50.00 %	0.25 %	5	50.00 %	0.32 %	10	0.25 %
Native Hawaiian	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
Guamanian or Chamorro	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
Samoan	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
Other Pacific Islander	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
White	1,528	55.16 %	75.98 %	950	34.30 %	60.55 %	2,770	69.55 %
Two or more Minority Races	0	0.00 %	0.00 %	1	50.00 %	0.06 %	2	0.05 %
Joint Race	21	61.76 %	1.04 %	10	29.41 %	0.64 %	34	0.85 %
Not Provided	131	59.01 %	6.51 %	77	34.68 %	4.91 %	222	5.57 %
Not Applicable	5	100.00 %	0.25 %	0	0.00 %	0.00 %	5	0.13 %
Not Calculated	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
Total	2,011	50.49 %	100.00 %	1,569	39.39 %	100.00 %	3,983	100.00 %

Applicant Income Category	Conventional			FHA			Total	
	Count	Row %	Col %	Count	Row %	Col %	Count	Col %
Low < 50%	265	28.43 %	13.18 %	580	62.23 %	36.97 %	932	23.40 %
Moderate 50 - 79.99%	336	34.71 %	16.71 %	500	51.65 %	31.87 %	968	24.30 %
Middle 80 - 119.99%	424	52.15 %	21.08 %	282	34.69 %	17.97 %	813	20.41 %
Upper >= 120%	977	78.04 %	48.58 %	200	15.97 %	12.75 %	1,252	31.43 %
Not Available	10	52.63 %	0.50 %	7	36.84 %	0.45 %	19	0.48 %
Total	2,011	50.49 %	100.00 %	1,569	39.39 %	100.00 %	3,983	100.00 %

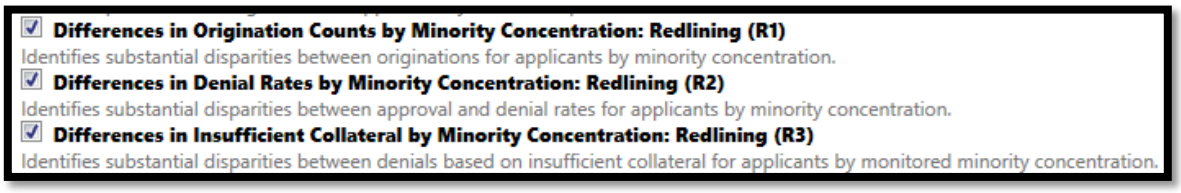
a. White applicants applied for FHA loans 34.30% of the time. Blacks, by comparison, applied 60.82% of the time. The proportion for blacks was calculated to be significantly higher
b. For applicant income, middle- and upper-income groups were combined into one control group. Out of 1,401 applications, 482 middle- and upper-income persons applied for FHA loans. That percentage came out to 34.43%, compared to 62.23% for low-income or 51.65% for moderate-income applicants

3. **Close the Report Viewer**
4. **Unselect** the checked report

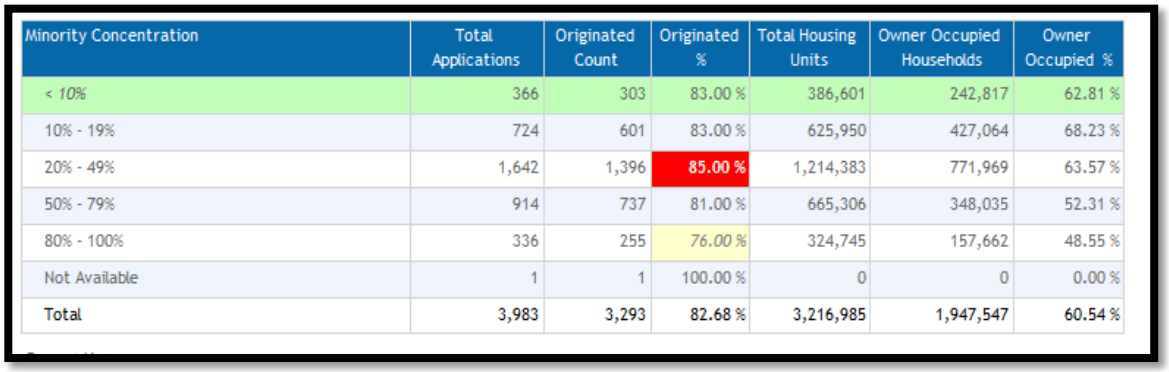
Redlining Reports (Origination Counts, Denial Rates, Insufficient Collateral)

Virtually every report contains sections labeled “Tract Income Category” and “Tract Minority Level”. If applications were received less often in these areas, denied more frequently once received, and/or priced higher once originated, redlining risks existed for the time period under review.

These standalone reports provide another view of redlining risk. No options are available for these three reports, other than providing a filter ahead of time if desired (such as Home Purchase, Home Improvement, Refinance, Conventional, etc.)



1. For this example all **three redlining reports** will be selected at once; however, each can be selected individually



Minority Concentration	Total Applications	Originated Count	Originated %	Total Housing Units	Owner Occupied Households	Owner Occupied %
< 10%	366	303	83.00 %	386,601	242,817	62.81 %
10% - 19%	724	601	83.00 %	625,950	427,064	68.23 %
20% - 49%	1,642	1,396	**85.00 %**	1,214,383	771,969	63.57 %
50% - 79%	914	737	81.00 %	665,306	348,035	52.31 %
80% - 100%	336	255	*76.00 %*	324,745	157,662	48.55 %
Not Available	1	1	100.00 %	0	0	0.00 %
Total	3,983	3,293	82.68 %	3,216,985	1,947,547	60.54 %

2. Click **Generate Report**
3. **Review Results** for “Differences in Origination Counts by Minority Concentration: Redlining (R1)”

    a. For the file under review here, the origination rates in minority areas (50% - 79% and 80% - 100% areas) are approximately the same, as less than 10% minority. Red cells would appear (like in 20-49%) in the origination % column if this was not the case, as red indicates statistically significantly higher whereas yellow indicates statistically significantly lower
    b. For this report, it is important to review the higher minority concentration areas that are significantly lower than the control group, which is in green highlighting
4. Toggle to the next Redlining report**:**
    a. Navigate to the **Selected Reports** drop down list and select the Differences in Denial Rates report

5. **Review Results** for "Differences in Denial Rates by Minority Concentration: Redlining (R2)"

Tract Minority	Loan originated			Application Approved but not accepted			Application denied			Application withdrawn by applicant			Total	
	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Col %
< 10%	303	82.79 %	9.20 %	1	0.27 %	10.00 %	28	7.65 %	8.81 %	34	9.29 %	9.39 %	366	9.19 %
10% - 19%	602	83.03 %	18.28 %	0	0.00 %	0.00 %	61	8.41 %	19.18 %	62	8.55 %	17.13 %	725	18.20 %
20% - 49%	1,396	85.02 %	42.39 %	6	0.37 %	60.00 %	110	6.70 %	34.59 %	130	7.92 %	35.91 %	1,642	41.23 %
50% - 79%	737	80.63 %	22.38 %	1	0.11 %	10.00 %	87	9.52 %	27.36 %	89	9.74 %	24.59 %	914	22.95 %
80% - 100%	255	75.89 %	7.74 %	2	0.60 %	20.00 %	32	9.52 %	10.06 %	47	13.99 %	12.98 %	336	8.44 %
Not Available	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %	0.00 %	0	0.00 %
Total	3,293	82.68 %	100.00 %	10	0.25 %	100.00 %	318	7.98 %	100.00 %	362	9.09 %	100.00 %	3,983	100.00 %

   a. For the file under review here, the denial rates for 50%-79% minority area was significantly different to the denial rate in the less than 10% minority tract areas and is shaded in red. 80%-100% was not significantly different and is not shaded in red
   b. This report is four pages, breaking the findings into income categories (low and moderate, middle, upper)
6. Toggle to the next Redlining report**:**
   a. Navigate to the **Selected Reports** drop down list and select the Differences in Insufficient Collateral…report
7. **Review Results** for "Differences in Insufficient Collateral by Minority Concentration: Redlining (R3)"

Tract Minority	Denied Count	Insufficient Collateral	Percentage
< 10%	28	13	46.00 %
10% - 19%	61	27	44.00 %
20% - 49%	110	45	41.00 %
50% - 79%	87	26	*30.00 %*
80% - 100%	32	12	38.00 %
Not Available	0	0	0.00 %
Total	318	123	38.68 %

   a. For the file under review here, the percentage of denials for "insufficient collateral" were actually lower than the "less than 10% minority" tracts used as the control group. If significant differences had been higher, the percentage column would have contained red cells

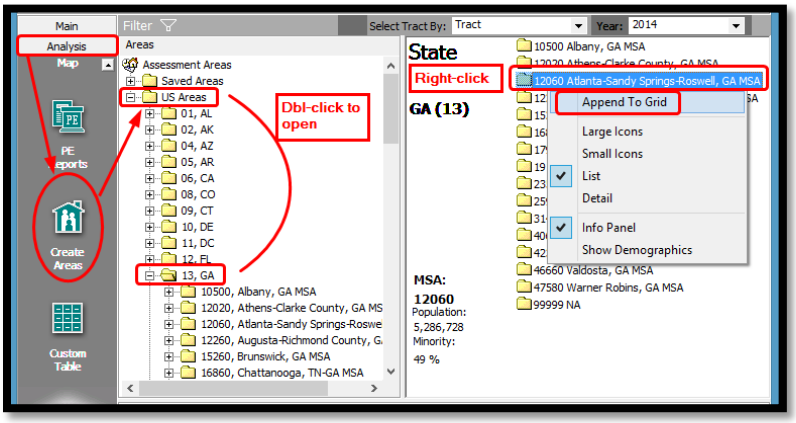
Redlining and Marketing Scorecard (M6)

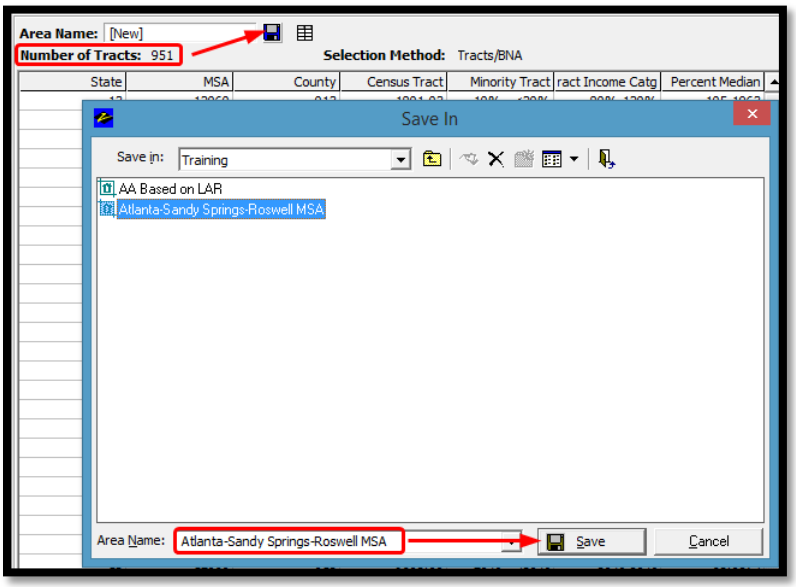
The Fair Lending Examination Procedures outline several marketing risks, some of which can be monitored by using HMDA data. The primary goal is to determine if the institution is serving all segments of a market equally or if there are potential areas for improvement.

The Redlining and Marketing Scorecard report looks at the demographics of your various markets, compares the applications taken and originations made against those demographics, and compares your applications against the peer.

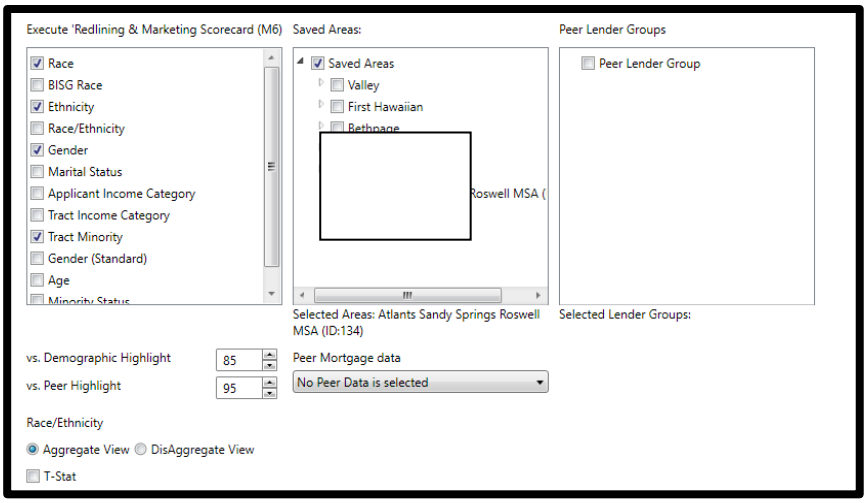
To run the report:

1. **Close the report viewer** if it is open
2. From the Fair Lending Reports list, select **Redlining and Marketing Scorecard (M6)**
3. To run the report, an Assessment Area is helpful and should be selected. If you have not already created an assessment area, follow the steps below:
   - **a.** Click the **left-most *Wiz* icon** in the Windows taskbar
   - **b.** Click the **Analysis** button
   - **c.** Click the **Create Areas** button
   - **d.** In the Areas list (left side of the screen), double-click **US Areas**
   - **e.** Double-click the area you wish to create, in this case **13, GA**
   - **f.** On the right-side of the screen, **right-click** on "12060 Atlanta-Sandy Springs-Roswell, GA MSA"
   - **g.** Select **Append to Grid**
   - **h.** With the Grid showing 951 tracts, click the **Save** button
   - **i.** Type in an area name of **Atlanta-Sandy Springs-Roswell MSA**
   - **j.** Click **Save**



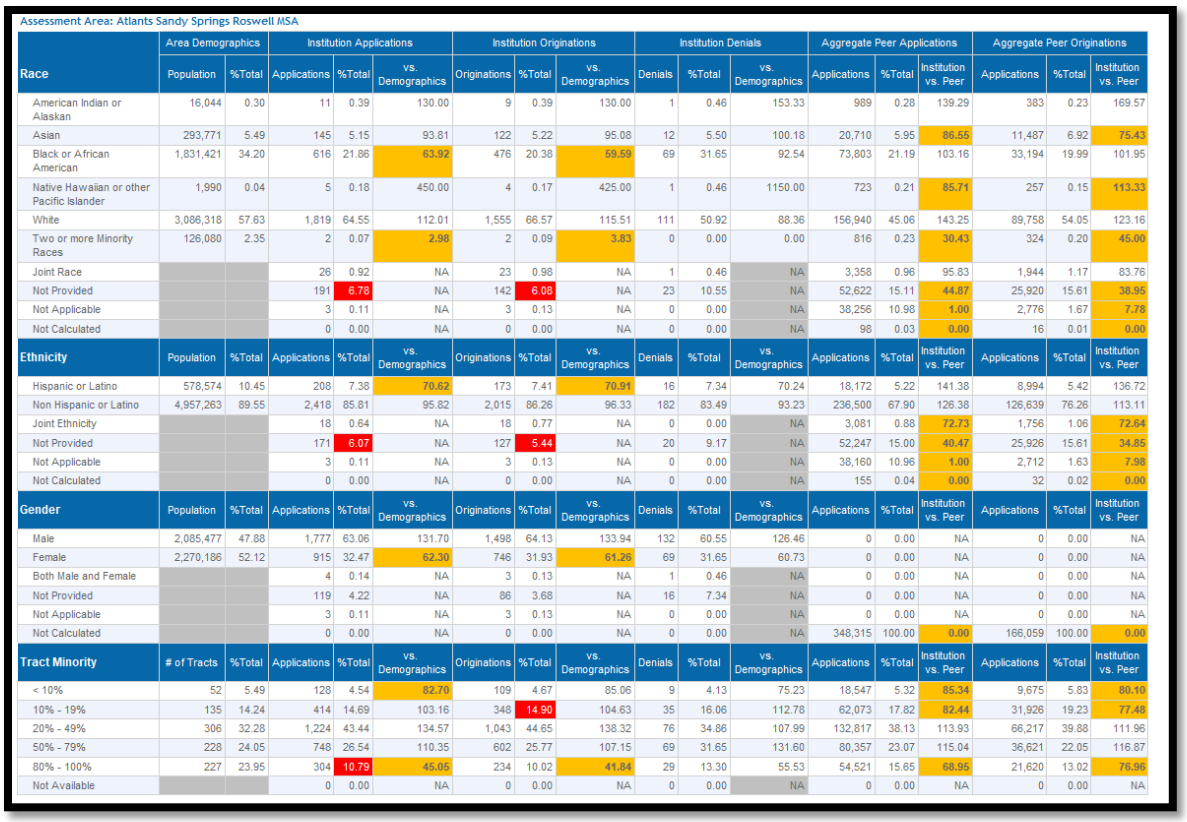


4. In the Windows Taskbar, click the **right-most *Wiz* icon** (Fair Lending Reports)
5. Select the Redlining and Marketing Scorecard report
6. Select categories you wish to run the report. In this case only certain ones will be selected, but all can be selected at once:
   a. Select the following:
      i. Race
      ii. Ethnicity
      iii. Gender
      iv. Tract Minority
   b. In the Saved Areas listing, select the area you wish to analyze, in this case **Atlanta-Sandy Springs-Roswell MSA**
   c. Leave the benchmark designations at the **default settings** (85% for demographics, 95% for peer)
      i. These benchmarks can be changed based on the institution's preference, there is not a defined standard
   d. Click **Aggregate View**
   e. Peer Mortgage Data – select the **year of Peer data** applicable
   f. Keep **Aggregate View**
   g. Click **T-Stat**, if you wish to see the T-Stat values
   h. Leave the **Agency** selection set to **All**
   i. Leave **Lender Groups** selection blank, unless you have a specific group of lenders you wish to analyze. In this case select the group applicable



7. Click **Generate Report**

8. **Review Results**:



Assessment Area: Atlants Sandy Springs Roswell MSA

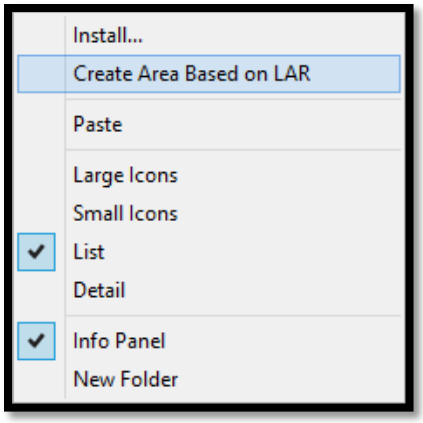
	Area Demographics		Institution Applications			Institution Originations			Institution Denials			Aggregate Peer Applications			Aggregate Peer Originations		
Race	Population	%Total	Applications	%Total	vs. Demographics	Originations	%Total	vs. Demographics	Denials	%Total	vs. Demographics	Applications	%Total	Institution vs. Peer	Applications	%Total	Institution vs. Peer
American Indian or Alaskan	16,044	0.30	11	0.39	130.00	9	0.39	130.00	1	0.46	153.33	989	0.28	139.29	383	0.23	169.57
Asian	293,771	5.49	145	5.15	93.81	122	5.22	95.08	12	5.50	100.18	20,710	5.95	86.55	11,487	6.92	75.43
Black or African American	1,831,421	34.20	616	21.86	63.92	476	20.38	59.59	69	31.65	92.54	73,803	21.19	103.16	33,194	19.99	101.95
Native Hawaiian or other Pacific Islander	1,990	0.04	5	0.18	450.00	4	0.17	425.00	1	0.46	1150.00	723	0.21	85.71	257	0.15	113.33
White	3,086,318	57.63	1,819	64.55	112.01	1,555	66.57	115.51	111	50.92	88.36	156,940	45.06	143.25	89,758	54.05	123.16
Two or more Minority Races	126,080	2.35	2	0.07	2.98	2	0.09	3.83	0	0.00	0.00	816	0.23	30.43	324	0.20	45.00
Joint Race			26	0.92	NA	23	0.98	NA	1	0.46	NA	3,358	0.96	95.83	1,944	1.17	83.76
Not Provided			191	6.78	NA	142	6.08	NA	23	10.55	NA	52,622	15.11	44.87	25,920	15.61	38.95
Not Applicable			3	0.11	NA	3	0.13	NA	0	0.00	NA	38,256	10.98	1.00	2,776	1.67	7.78
Not Calculated			0	0.00	NA	0	0.00	NA	0	0.00	NA	98	0.03	0.00	16	0.01	0.00
Ethnicity	Population	%Total	Applications	%Total	vs. Demographics	Originations	%Total	vs. Demographics	Denials	%Total	vs. Demographics	Applications	%Total	Institution vs. Peer	Applications	%Total	Institution vs. Peer
Hispanic or Latino	578,574	10.45	208	7.38	70.62	173	7.41	70.91	16	7.34	70.24	18,172	5.22	141.38	8,994	5.42	136.72
Non Hispanic or Latino	4,957,263	89.55	2,418	85.81	95.82	2,015	86.26	96.33	182	83.49	93.23	236,500	67.90	126.38	126,639	76.26	113.11
Joint Ethnicity			18	0.64	NA	18	0.77	NA	0	0.00	NA	3,081	0.88	72.73	1,756	1.06	72.64
Not Provided			171	6.07	NA	127	5.44	NA	20	9.17	NA	52,247	15.00	40.47	25,926	15.61	34.85
Not Applicable			3	0.11	NA	3	0.13	NA	0	0.00	NA	38,160	10.96	1.00	2,712	1.63	7.98
Not Calculated			0	0.00	NA	0	0.00	NA	0	0.00	NA	155	0.04	0.00	32	0.02	0.00
Gender	Population	%Total	Applications	%Total	vs. Demographics	Originations	%Total	vs. Demographics	Denials	%Total	vs. Demographics	Applications	%Total	Institution vs. Peer	Applications	%Total	Institution vs. Peer
Male	2,085,477	47.88	1,777	63.06	131.70	1,498	64.13	133.94	132	60.55	126.46	0	0.00	NA	0	0.00	NA
Female	2,270,186	52.12	915	32.47	62.30	746	31.93	61.26	69	31.65	60.73	0	0.00	NA	0	0.00	NA
Both Male and Female			4	0.14	NA	3	0.13	NA	1	0.46	NA	0	0.00	NA	0	0.00	NA
Not Provided			119	4.22	NA	86	3.68	NA	16	7.34	NA	0	0.00	NA	0	0.00	NA
Not Applicable			3	0.11	NA	3	0.13	NA	0	0.00	NA	0	0.00	NA	0	0.00	NA
Not Calculated			0	0.00	NA	0	0.00	NA	0	0.00	NA	348,315	100.00	0.00	166,059	100.00	0.00
Tract Minority	# of Tracts	%Total	Applications	%Total	vs. Demographics	Originations	%Total	vs. Demographics	Denials	%Total	vs. Demographics	Applications	%Total	Institution vs. Peer	Applications	%Total	Institution vs. Peer
< 10%	52	5.49	128	4.54	82.70	109	4.67	85.06	9	4.13	75.23	18,547	5.32	85.34	9,675	5.83	80.10
10% - 19%	135	14.24	414	14.69	103.16	348	14.90	104.63	35	16.06	112.78	62,073	17.82	82.44	31,926	19.23	77.48
20% - 49%	306	32.28	1,224	43.44	134.57	1,043	44.65	138.32	76	34.86	107.99	132,817	38.13	113.93	66,217	39.88	111.96
50% - 79%	228	24.05	748	26.54	110.35	602	25.77	107.15	69	31.65	131.60	80,357	23.07	115.04	36,621	22.05	116.87
80% - 100%	227	23.95	304	10.79	45.05	234	10.02	41.84	29	13.30	55.53	54,521	15.65	68.95	21,620	13.02	76.96
Not Available			0	0.00	NA	0	0.00	NA	0	0.00	NA	0	0.00	NA	0	0.00	NA

   a. Applications from Blacks: 34.20% of the population in the Atlanta MSA was Black or African-American. The institution received 21.86% of its applications from that group, or 63.92% of the demographic. 63.92% was below the 85% benchmark, so it is highlighted in orange
   b. Originations from Blacks: The percentage of Originations was lower than the applications percentage, at 59.59% of the demographic
   c. Applications compared to peer: The peer received 21.19% of its applications from blacks compared to this institution's percentage of 21.86%. Because 21.86% was higher than 21.19%, the percentage showed 103.16% and is not highlighted in orange
9. **Close the report viewer**
10. **Close Fair Lending Reports**

Notes on this Risk Factor Report:

1. This report is available for Mortgage and Consumer files only
   a. Consumer Files will only compare the institution's activity to the demographics due to lack of peer data
2. This report must have defined Assessment Areas to provide demographic information. For HMDA reporters, assessment areas are likely already defined in the Wiz. For Consumer and Auto files, however, you can create "Assessment Areas" based on where your institution does business (make areas based on the MSAs where you concentrate your business)
3. To create an "Assessment Area" based on where the loan applications came from, follow these steps:
   a. Click the Analysis button
   b. Click the Create Areas button

c. In the Display Pane (the upper-right area), click in a blank area to open a context-sensitive menu
d. Select **Create Area Based on LAR** and navigate to the file you want to analyze
e. Once the list of tracts is in the "grid" (lower part of the screen), click the **Save** button and name the area accordingly



Chapter 10 – Decisioning Regression Analysis

You have already used the Fair Lending Reports, such as the Focal Point Report and other Risk Factor Analysis Reports to determine the risk that you have in your lending patterns.

Regression analysis is an industry standard practice used to test for disparate impact by controlling for credit policy factors such as credit score, debt-to-income, or combined-loan-to-value criteria, that may impact the decision to approve or deny.

The decision to approve or deny is considered a "binary" decision (you were either approved '1', or you weren't '0'). The decision to approve or deny is the "dependent" variable, while the factors used to make the decision are the independent variables.

This chapter will cover the thought process behind building a successful decisioning regression analysis, which must be done with care. Good data is critical to the process, so the data should have already been "scrubbed", with "odd" values in the data fields either corrected, "capped" or nulled out if they can't be fixed. Text fields should have been converted to numeric values for use in the modeling.

Overview of Logistic Regression

The type of regression analysis used to analyze the underwriting process is called "logistic regression". By contrast, the regression analysis used to determine pricing is called a "linear regression".

In statistics, logistic regression analysis is a model used to predict the probability of a specific event. If we consider the specific event to be that an applicant was approved for a loan, then the model is predicting that person's probability of approval. The flip side, of course, is the probability that the person should have been denied.

A given loan file has a series of observed data points (applicants). Each applicant has a set of explanatory variables (also called independent variables, predictor variables, input variables, features, attributes or factors). Each applicant also was either denied (value of 0) or approved (value of 1). The goal of logistic regression is to explain the relationship between the explanatory variables and the approval/denial outcome. The model calculates the relationships by looking at the decisions made for a certain time period (quarterly, semi-annually, annually) and analyzing each variable's apparent importance to the decisioning process. A minimum number of applications are needed to accomplish the necessary statistical tasks (200 to 250 applications that have varying outcomes and are comprised of prohibited basis and control applicants).

What factors go into the probability calculation? A chief component would be the person's willingness to repay debts incurred in the past (the credit score). Another might be the how much debt they are carrying (the debt ratio), and a third might be the amount they need to borrow compared to the value of the dwelling they hope to acquire or refinance (the CLTV/LTV ratio). Other factors can come into play as well, such as whether they qualify for a government insured or guaranteed loan (FHA, VA, or a USDA program), whether they are using the dwelling as their primary residence or are buying as an investment property, whether they are asking for cash back for improvements, and so on.

Your institution's policies, procedures, limitations, available product types, risk appetite, and whether you have policy exceptions also make a difference in whether someone gets a loan or not.

In other words, the relationships are determined by looking at how the decisions were made for the entire portfolio under review.

The logistic function is:

$$F(x) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x)}}$$

- $F(x)$ is the probability of the dependent variable equaling "success" (an approval in our case here)
- Base "*e*" is a called the natural exponential function. *e* is Euler's number, a transcendental number (a constant number similar to "Pi" π) approximately equal to 2.718 281 828. The exponential function is used to model a relationship in which a constant change in the independent variable gives the same proportional change in the dependent variable
- β_0 is the intercept from the linear regression equation (the value of the criterion when the predictor(s) is equal to zero)
- $\beta_1 x$ is the regression coefficient multiplied by the value of the predictor

Overview of Factors That Can be Used for Logistic Regression

Generally speaking, numeric indicators of items that are specifically laid out in policy statements or other underwriting guidelines should be included as factors used to explain the decisions made. If at all possible, there should be data elements representing each of these factors (predictors). Sometimes, they can be "derived" from text fields that are included in the data.

- The Credit scores used in the decision
- If there is an applicant AND a co-applicant, and BOTH have merged scores, you have to ask whether the HIGHER of the two scores is used, or the LOWER of the two scores is used
    - Based on the score used, you may need to create a custom field that will contain the higher or lower of the applicant/co-applicant score, which will then be used in regression
- Raw Credit scores are considered "continuous variables". An alternative to using raw credit scores is to establish binary values that explain the presence (or absence) of an applicant within a particular credit "bucket" or "tier", which can be derived from policy or in our case, the "dummy variables" below:
    - Example: A field called CS_740_up is defined as an Integer field. If an applicant's score is 740 or higher, then a "1" goes in CS_740_up. If their score is less than 740 then a "0" goes in
    - If there are 7 buckets, establish 7 fields "Is740_up", "Is720_739", "Is700_719", and so on. When using these fields in a regression model, you MUST leave out at least one of these fields so the model can compare the outcomes of the included bins against the "reference" field. The buckets should reflect the credit score ranges used in underwriting or pricing
    - Alternatively, you can create a linear tier field with the best scores in tier 1, next best in tier 2, and so on,and applicants without a score in the last tier. The tiers should reflect the credit score ranges used in underwriting or pricing, below is the example used for training purposes
        - Tier 1 – 40+
        - Tier 2—720-739
        - Tier 3—700-719
        - Tier 4—680-699
        - Tier 5—660-679
        - Tier 6—640-659
        - Tier 7—620—639
        - Tier 8 <620
        - Tier 9 — No Score
- Debt ratios
    - The "front-end ratio", sometimes known as the Housing Expense ratio, is the PITI (Principal, Interest, Taxes and Insurance) payment required for the new loan, divided by gross monthly income
    - The "back-end ratio", also known as total debt ratio or debt-to-income ratio is the PITI plus all required monthly payments on all debts
- Loan-to-Value Ratios (LTV) is the requested loan amount divided by the appraised value of the residence
    - CLTV is the Combined LTV (both first and second lien), if a second lien is in place
- Credit components already considered in the credit score (or scores)
    - Some institutions require their lenders to dissect the credit report, looking for late payments of a particular kind (on a previous mortgage, for example), or a bankruptcy
        - Consider having an numeric indicator showing either there was or was not a bankruptcy or late payment or a numeric indicator that contains the number of bankruptcies or late payments indicated in the file

- Other possible indicators:
    - Length of employment in current job (make sure that all data reflects the same thing – either months or years of employment, not some of each)
    - Length of residence (make sure of the consistency of the data)
    - Home ownership indicator (as a 0 if "No", 1 if "Yes")
    - Construction to Perm Indicator (as a 0 if "No", 1 if "yes")
    - Employee Indicator (as a 0 if "No", 1 if "yes")
    - Self-employed indicator (as a 0 if "No", 1 if "Yes")
    - Current account holder at the institution (as a 0 if "No", 1 if "Yes")
    - Auto-debit of payment from account at institution (either as 0 and 1, or as amount)
    - CREDIT CARDS: Percentage of credit lines used
    - CREDIT CARDS: Secured card indicator (0 if "No", 1 if "Yes")
    - CAR LOANS: New or Used indicator (0 if "Used", 1 if "New")
    - CAR LOANS: Certified Pre-Owned indicator (0 if "No", 1 if "Yes")
    - PROPRIETARY SCORES: Make sure you understand the possible range and the direction (is it higher numbers reflect better credit, or lower?)

- HMDA codes (if you understand the values behind the numbers, and what YOU have):
    - HMDA fields can be used, though they may require additional formatting or changes (please refer to Chapter 8, "Understanding the Meaning Behind HMDA Codes") for more information
        - Regression is looking for a linear relationship in the meaning behind the numbers
            - For example, Construction Method 1-Site Built and 2-Manufactured Home. But within "1" may be 1-4 family, condos, co-ops and multifamily properties. Within "2" may be manufactured homes with or without land and manufactured home parks. Those different property types likely have different underwriting requirements. If necessary, set up user defined codes.
    - Lien Status (if first or subordinate lien)
    - Construction Method (if site built or Manufactured)
    - Occupancy Type (if Primary Residence, Second Residence, and Investment)

- Policy limitations
    - If policy limitations are in place there should be an indicator that the borrower exceeded that limit:
        - Qualified Mortgage (QM) rules state that the DTI Ratio cannot go over 43%
            - Set up a new field called QM and populate with a 0 if 43% or below and a 1 if 43.01% or higher
        - LTV/CLTV Limits might prohibit any loan with an LTV/CLTV ratio higher than 110% (except for special programs)
            - Set up a new field called LTV_Limit with a 1 if over 110% and a 0 if <= 110%
    - CAR LOANS: Mileage limits might impact the approval. A limit might be 80,000 miles unless it fits into a special program (classic cars, commercial trucks)
        - Set up a new field called MileageLmt with a 1 if over 80,000 miles and a 0 if not

This list is not exhaustive. Think about the fields that are needed based on your institution's underwriting policies and pricing matrix.

Testing the Model

There are several methods for testing the effectiveness of a model. Most of these tests are extremely complex. Rather than providing one test, Fair Lending Wiz provides 5 different tests:

- %Agreement – this represents a percentage of the time that the predicted outcome MATCHED the actual outcome. For each applicant, the model calculates the probability that the applicant should have been approved. The "line in the sand" for approval versus denial is based on the origination rate for the entire file under review.
    - In the file used in this manual, the origination rate is a very high (and somewhat unusual) origination rate of 82.67%
        - Applications without valid values in the predictor variables are excluded from the analysis. Therefore, the addition of each predictor can change the associated origination rate by leaving out the records without values in the fields being tested.
    - After determining the origination rate, any applicant with a probability equal to or higher than the origination rate is classified as "should have been approved"
    - Any applicant with a probability lower than the origination rate is classified as "should have been denied"
    - The model then compares the predicted outcomes to the actual outcomes.
        - AGREEMENT: If model prediction was "Approve" and the applicant was "Approved"
        - AGREEMENT: If model prediction was "Deny" and the applicant was "Denied"
        - DISAGREEMENT: If model prediction was "Approve" and the applicant was "Denied"
        - DISAGREEMENT: If model prediction was "Deny" and the applicant was "Approved"
    - Divide the Agreements by the total number of applications considered
        - DIRECTION: Higher is generally better
            - A higher %Agreement does not necessarily mean a better model

- X^2 (Chi-Squared) – pronounced like the "Ki" in "Kite", NOT like "She") – this formula estimates the predicted outcomes versus the actual occurrences
    - DIRECTION: Higher is generally better. For each new predictor variable added, the chi-squared number will increase slightly; larger file sizes will have higher Chi-Squared values

- AIC (Akaike Information Criterion) – this formula (developed by Hirotugu Akaike in 1974), is a measure of the relative quality of different models for a given set of data
    - Given a collection of different models, AIC estimates the quality of each model, relative to each of the other models. It provides a means for model selection. It deals with the trade-off between the "goodness of fit" of the model and the complexity of the model
        - Increasing the number of explanatory variables almost always improves the goodness of fit, and this helps measure
        - One rule-of-thumb for the number of records ("observations") per explanatory factor ranges from 10 to 15
    - DIRECTION: Lower is generally better
        - The AIC offers a relative estimate of the information lost with the data provided. Since the criterion is dependent upon the data delivered, make sure your data is as good as possible (no data extremes, or impossible values)

- R^2 (R-Squared) – This statistic indicates how useful the explanatory variables were in predicting the outcomes. Theoretically this value can approach a value of "1" if the explanatory variables explained everything that occurred in the file under review

    - DIRECTION: Higher is generally better

- X^2 Hosmer-Lemeshow Test – this is yet another statistical test (developed by Stanley Lemeshow and David Hosmer) measuring goodness of fit of a model
    - The test assesses whether or not the observed event rates (approval, denial) match the expected event rates. The test divides the applicants into 9 subgroups (deciles) and compares the expected versus observed event rates in the various groups.
    - DIRECTION: Lower is generally better
        - This test has come under some criticism by statisticians (but what hasn't?), so use with caution

- Derivatives – a derivative measures the sensitivity to change in the dependent variable when the independent variable changes by one unit of measure

Best Practices:

- Use a combination of these measurements when deciding what explanatory variables to use in your model

- Look carefully at the data behind the explanatory variable to see if you can validate and understand what the results are suggesting – items that look "too good to be true" might be

- Regression modeling is not "one size fits all". You must know your data and your policies to know what is going to work for your particular situation and the data you are analyzing

- Consider maintaining an Excel Spreadsheet of the various items that you tested in your model, and what the statistics had to say about each one

- Don't include an explanatory variable just because it increases the %Agreement. The item should make sense based on the underwriting guidelines

Base Model Setup and Interpretation

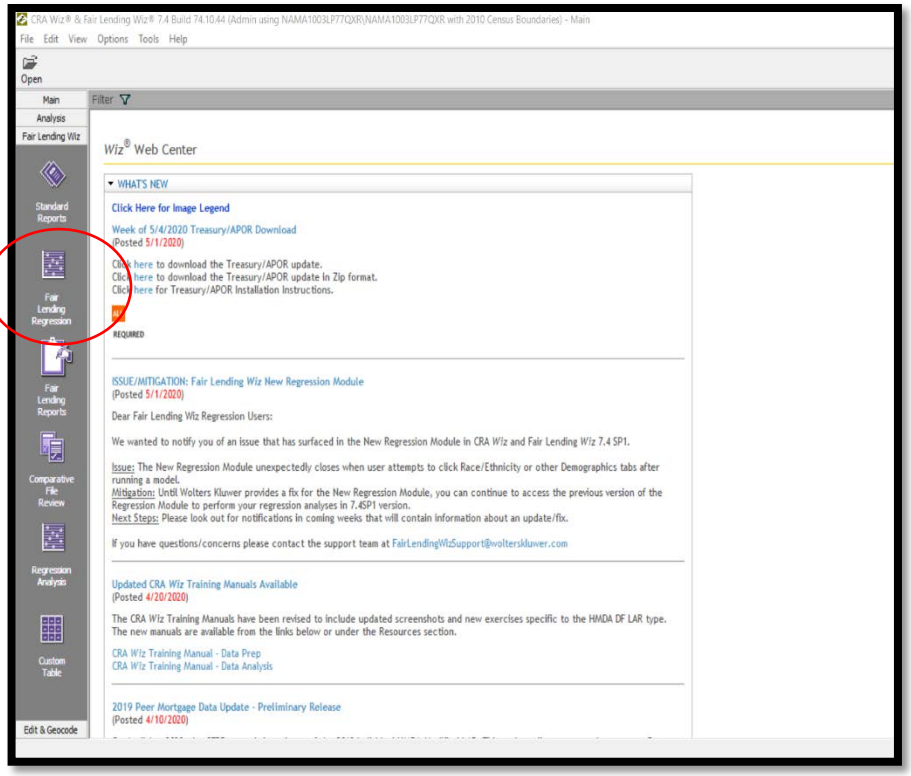
Start simple. Base your initial model on the explanatory variables that should, according to your underwriting guidelines, make the most difference. If there are items that you want to leave out any analysis such as Employee or Business loans the data should have a variable that identifies these circumstances so the user can filter the loans out of the analysis.

- In Mortgage lending, a good "base" model might include raw credit scores, raw CLTV ratios and raw back-end ratios
- In Consumer lending (credit cards, unsecured lines of credit, overdraft protection plans, etc.) a good "base" model may be raw credit scores and debt ratios only
- If a product line is "Secured" then an LTV might be appropriate. If not appropriate, then an indicator that it is a secured product might suffice
- In Auto lending a good base model consist of raw credit scores, raw debt ratios, raw LTV ratios, model year (or the number of years old), and a new/used indicator

Start by testing individual factors one at a time (adding a new factor to the base model, testing it, subtracting the new factor and adding another, etc.)

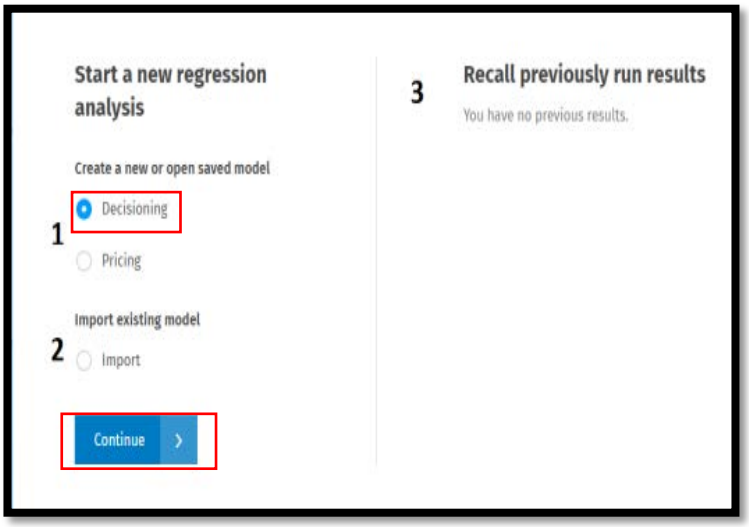
To begin

1. Click the Fair Lending Wiz tab
2. Click the Fair Lending Regression button

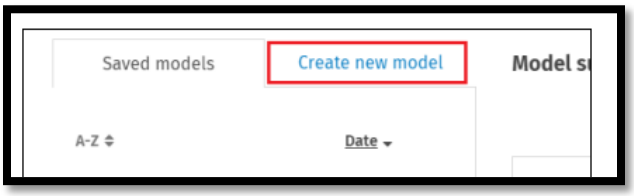


A new window will open

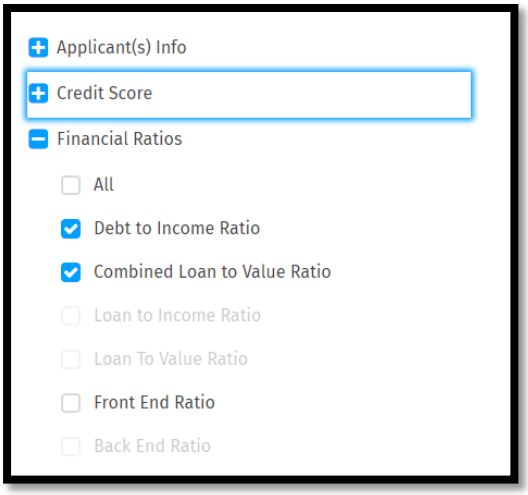
3. Click the Decisioning button
4. Select Continue



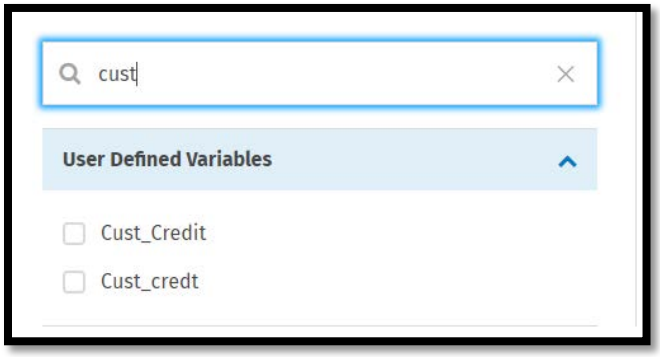
5. Click Create New Model



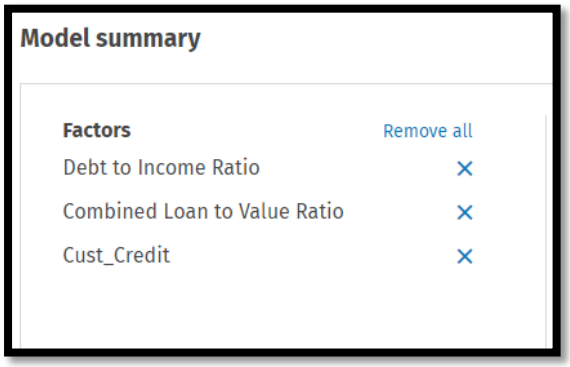
6. Select the factors to analyze by clicking the Plus Sign located next to the factor and then clicking the checkbox
    a. Start with a base model and select the credit score used in the decisioning process (for training, ours is a user defined field called Cust_Credit), CLTV, and DTI Ratio. After you establish the base, test each additional factor by itself. After you determine which factors are best to use, you will build the model with all factors selected



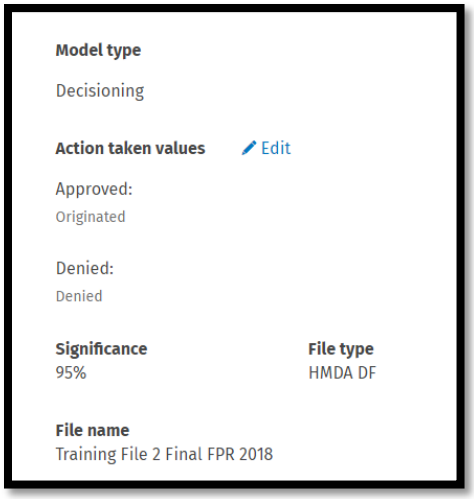
You can also search for the factors using the Search bar



7. "Model summary" pane will display the selected factors



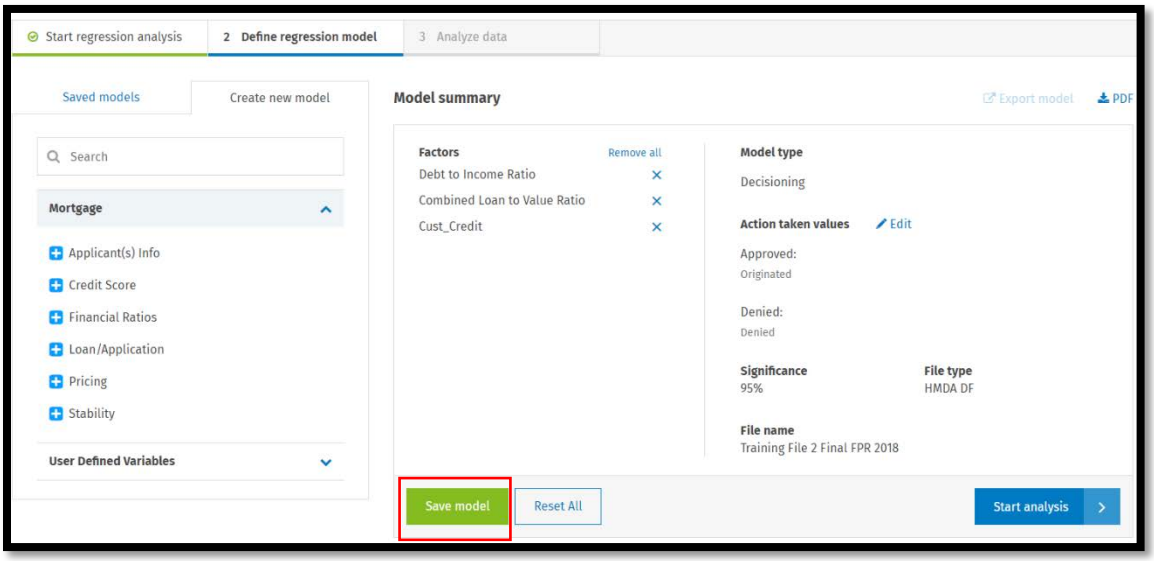
8. The “Action Taken values” section under Model type allows you to select the loans you wish to see as “Approvals” and as “Denials”
    a. The only action type that is on both sides of the equation is Approved Not Accepted. Each institution will need to determine what constitutes an “Approval” under their policy or regulator guidance. For Training purposes, Approved will be Originated and Denied will be Denied applications (the default settings)



9. Significance Level is defaulted to 95%

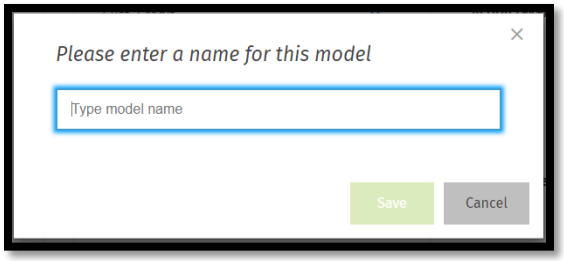
Saving Decisioning Regression Model

1. To save your model, click the Save model button



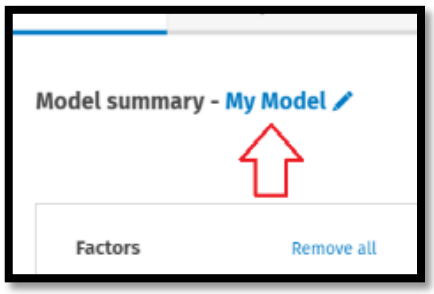
The software displays a dialog box

2. Enter a name for your saved model in the provided text box



Click the Save button

3. The software saves your model and displays the model name after Model summary at the top of the screen
    a. If you want to change the name of your model, click the model name, edit as necessary in the provided dialog box, then click the Save button

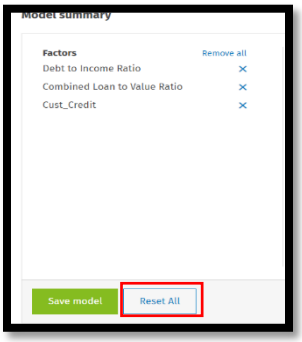


4. To save a copy of the model using a different name, click the Save as button

The software displays a dialog box

5. Enter a name for the new model
6. Click the Save button
    a. The software displays the model name in the Model summary

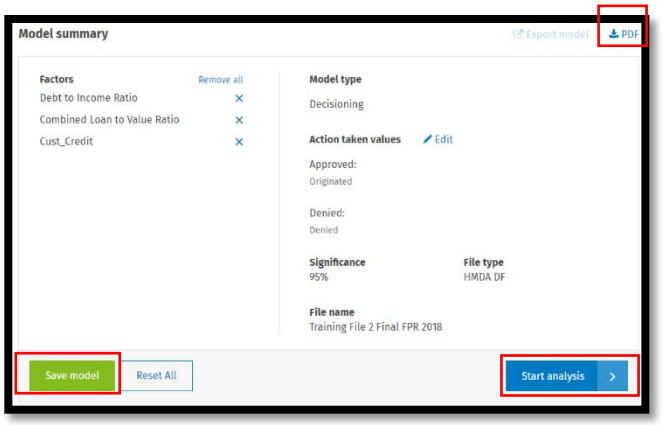
To remove all selected factors and start over, click the Reset All button



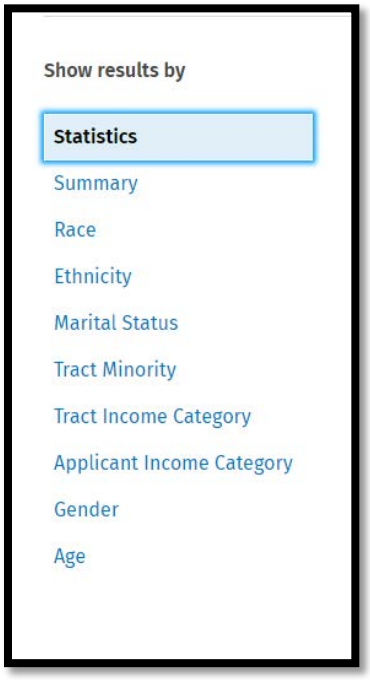
Running Decisioning Regression

1. After assessing which factors to use, create the model, consider saving it and printing the Model Summary to PDF

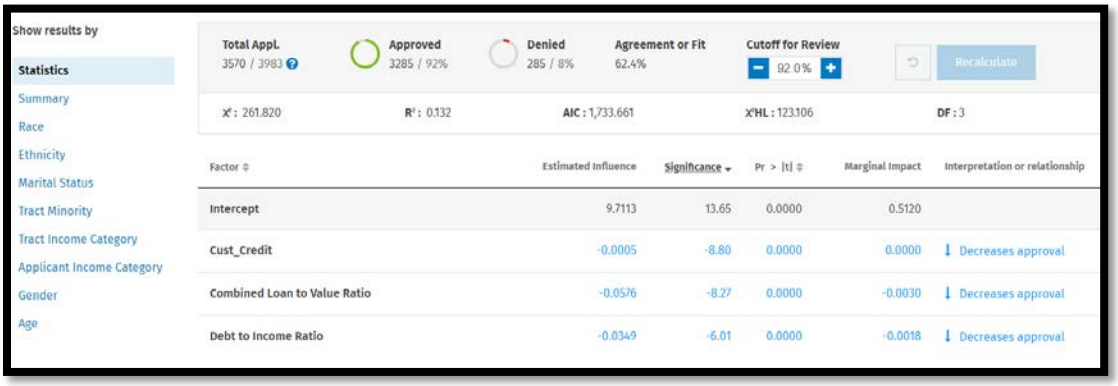
2. Then click Start Analysis



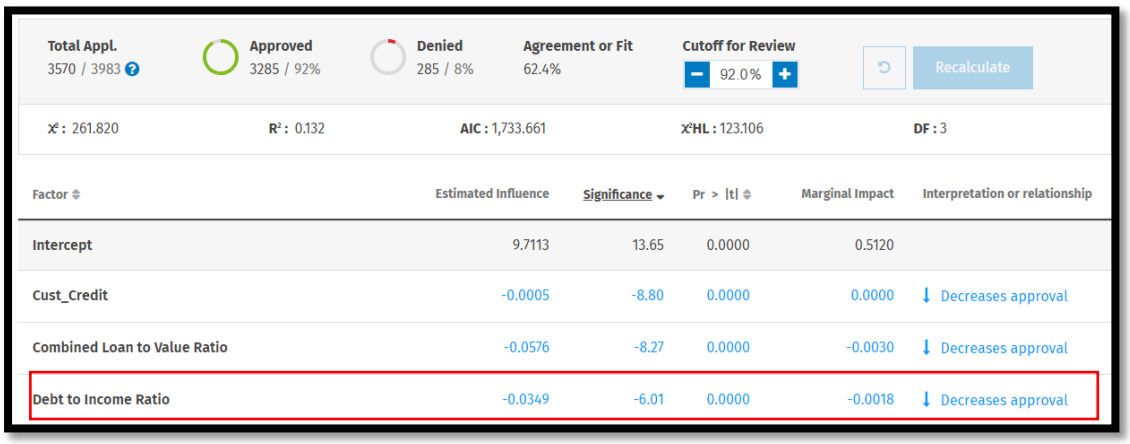
3. Once you have ran the model, you will be taken to the results screen. On the left-hand side of the screen, users can view the results by clicking on each category under "Show results by"



4. The Statistics Screen will display information about the model, including the statistical values of the overall model and the statistical significance of the factors used in the model

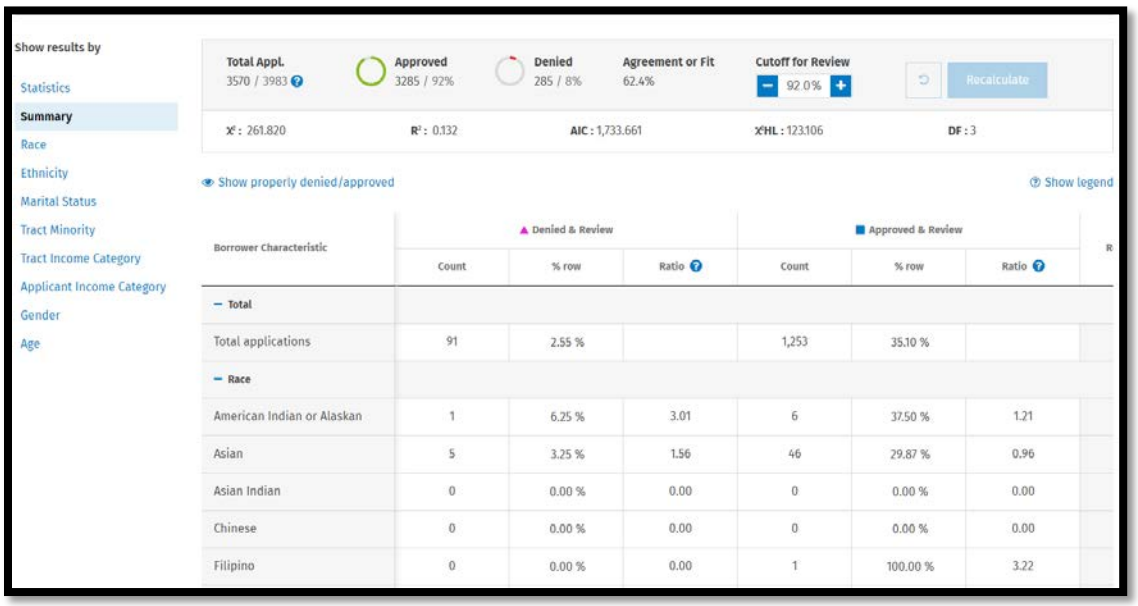


5. Consider recording the Total Appl., Agreement or Fit percentage, Estimated Influence, Significance (T-stat), and interpretation or relationship of each factor in an excel spreadsheet or take a screenshot of the statistics to keep for your records
    a. As the DTI Ratio increases, probability of approval decreases. Ensure that the relationship makes sense

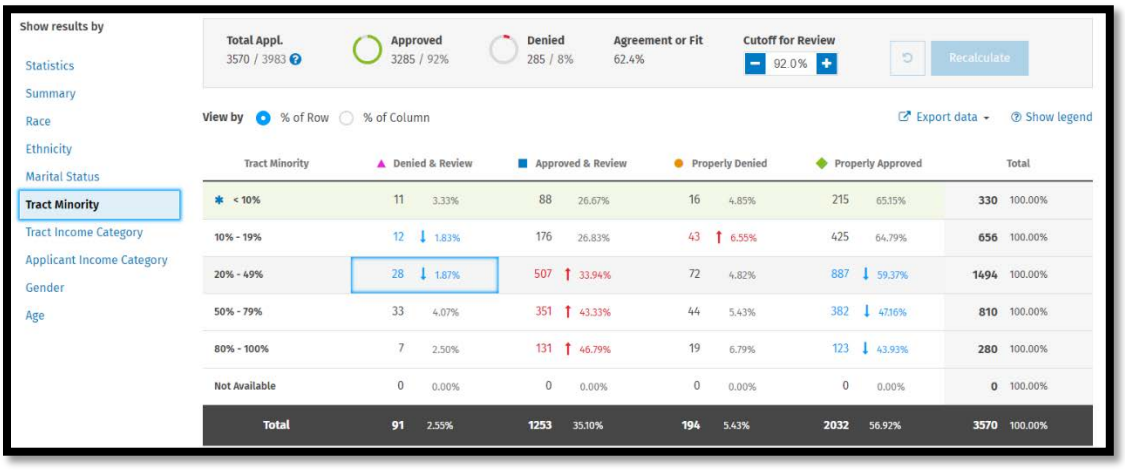


6. After the base is built, add each factor you are considering into the model one at a time. Compare the factor's information and statistics in how it affects the base model. Consider the following:
    - Run a new "base" using credit score tier instead of raw credit score. Did the results change?
    - Watch the Statistics for actual influence
    - Watch the %Agreement. A better model will increase the figure but do not use factors that drastically spike or decrease the figure. Do not add a value just to see the %Agreement rise
    - Watch the total number of records considered. A decrease in records means the data contains null values
        - Refer to custom tables to see the volume of applications being approved or denied for a particular factor
    - If using tiers or buckets, be sure to only add one or the other, not both. If using credit score buckets, be sure to leave on bucket out as a reference bucket

7. Next, the user will click on the “Summary” option from the left-hand sidebar. This view will provide the user with the number of total applications that were “Denied & Review” or “Approved & Review”, along with the breakdown via prohibited basis category

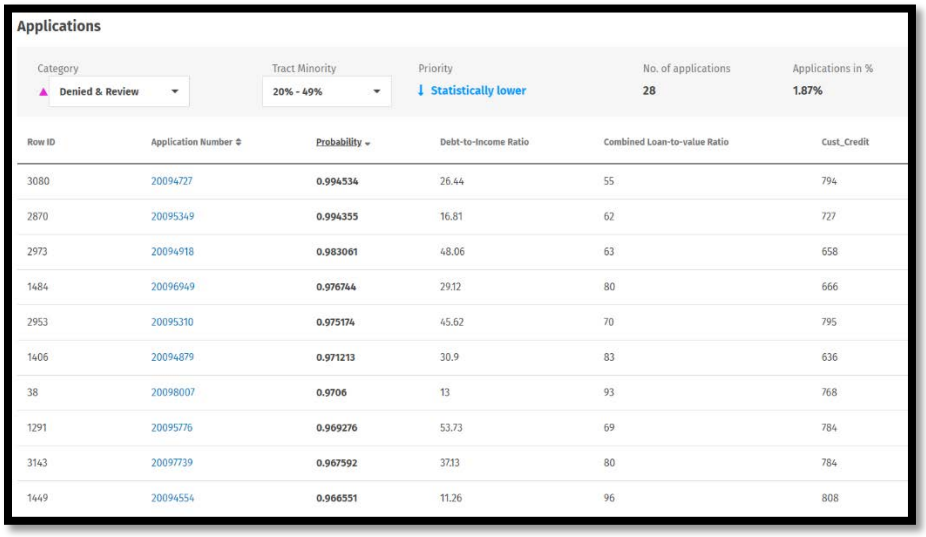


8. Then, click on each individual prohibited basis group from the left-hand side to view applications that are categorized as “Denied & Review”. Those that are statistically significant will be highlighted in either red or blue



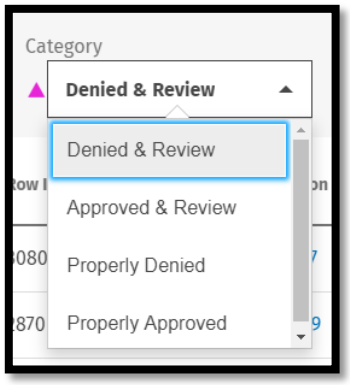
Red text indicates significantly higher than the control group. Blue text indicates significantly lower than control group. By clicking details, you will see the application’s probability of approval. Files with a higher probability of approval but were declined should be looked at first. You are reviewing for proper documentation of the decisions made, proper section of the denial reasons on the Statement of Denial and proof that the assistance provided was proper and not discriminatory.

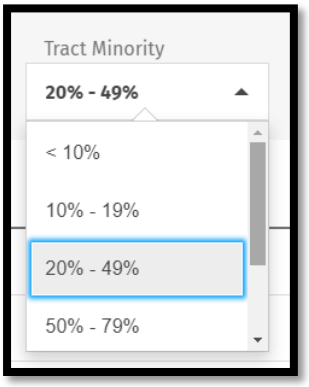
9. This will display the list of applications. For training, click on Denied & Review



Row ID	Application Number	Probability	Debt-to-Income Ratio	Combined Loan-to-value Ratio	Cust_Credit
3080	20094727	0.994534	26.44	55	794
2870	20095349	0.994355	16.81	62	727
2973	20094918	0.983061	48.06	63	658
1484	20096949	0.976744	29.12	80	666
2953	20095310	0.975174	45.62	70	795
1406	20094879	0.971213	30.9	83	636
38	20098007	0.9706	13	93	768
1291	20095776	0.969276	53.73	69	784
3143	20097739	0.967592	37.13	80	784
1449	20094554	0.966551	11.26	96	808

To change which applications the software displays in the window, select new criteria from either of the provided drop-down menus located at the top of the screen. In the above example, those are Category and Tract Minority

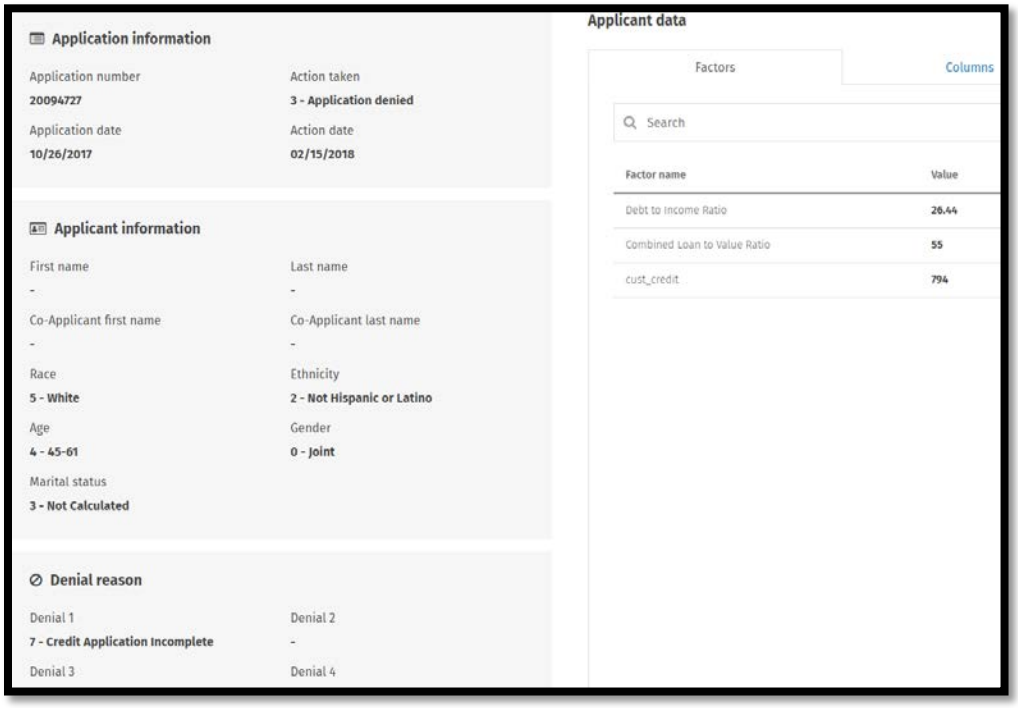




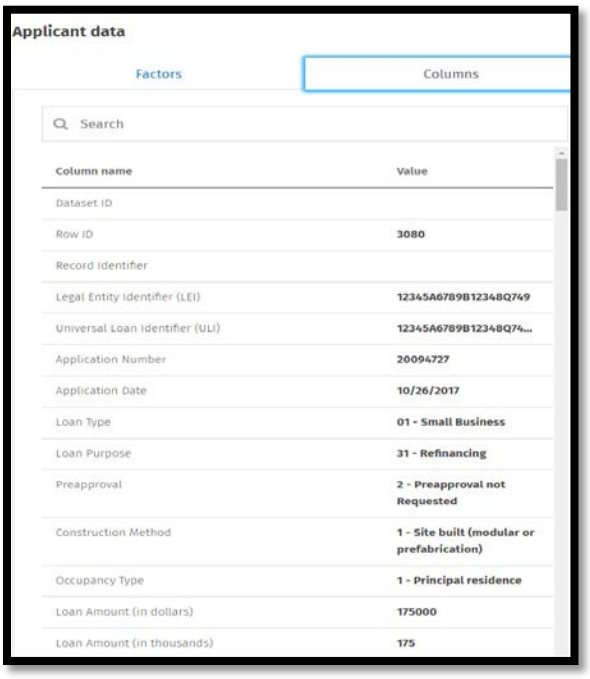
10. To view an individual application, click one of the application number links

Row ID	Application Number	Probability	Debt-to-Income Ratio	Combin
3080	20094727	0.994534	26.44	55
2870	20095349	0.994355	16.81	62
2973	20094918	0.983061	48.06	63
1484	20096949	0.976744	29.12	80

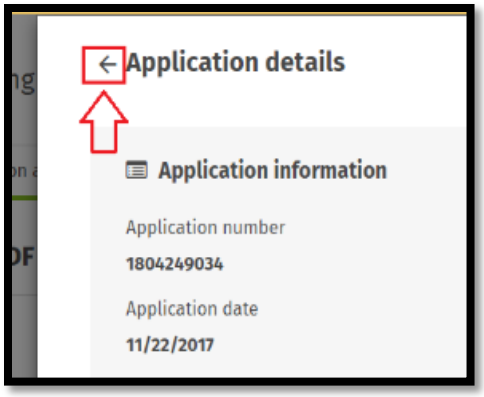
The software displays the Application details window



11. To view all of the application columns (fields), click the Columns tab located on the right side of the window



12. To return to the Applications window, click the arrow located at the top left of the screen

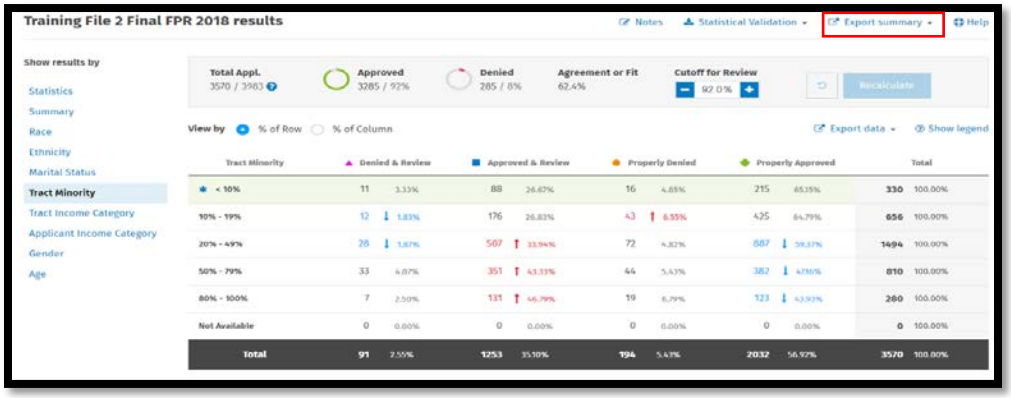


13. To close the Application details window completely and return to the results screen, click the close (X) button located at the top right of the screen

Exporting Decisioning Regression Summary

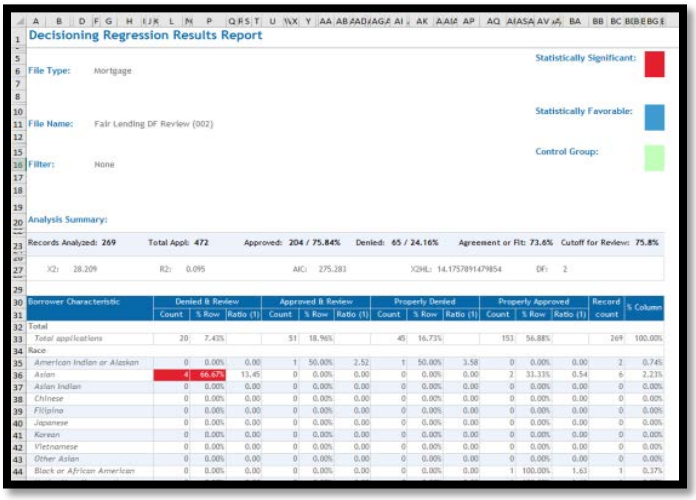
You can export a Decisioning Regression results summary report in PDF (portable document format) and Excel format.

1. At the top, right-hand side of the screen, the user will select "Export Summary" to save and view the results of the model in either PDF or Excel format



PDF Summary Report

Excel format - Compiles results from all demographic categories into a single output

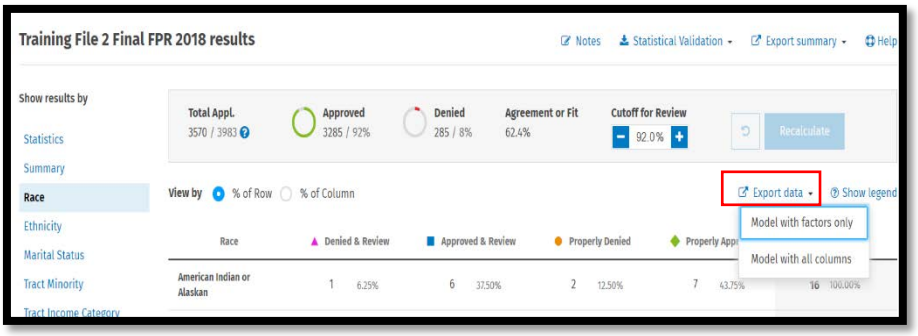


Exporting Data Results

The results of the decisioning regression for each prohibited basis can be exported to Excel for easy filtering and file selection via CSV (comma delimited)

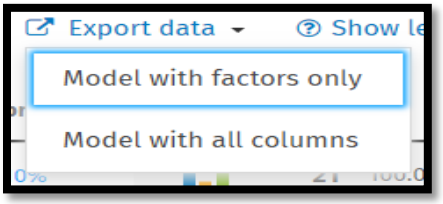
To export results data, follow these steps:

1. Click the Export data link located at the top left of the results pane



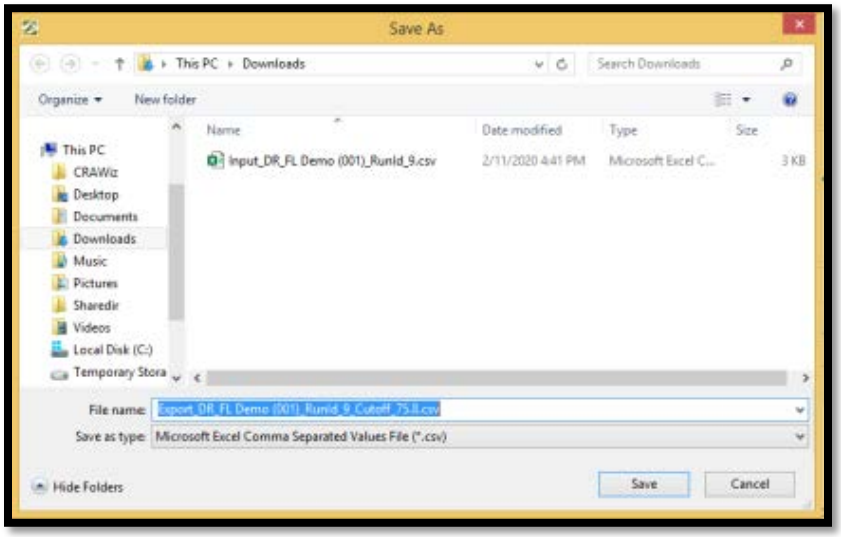
The software displays a drop-down menu

2. Select one of the two options



3. The software displays a Save As dialog box. Use the dialog box controls to select a location for and name the exported file

4. Click the Save button



The software exports your results data

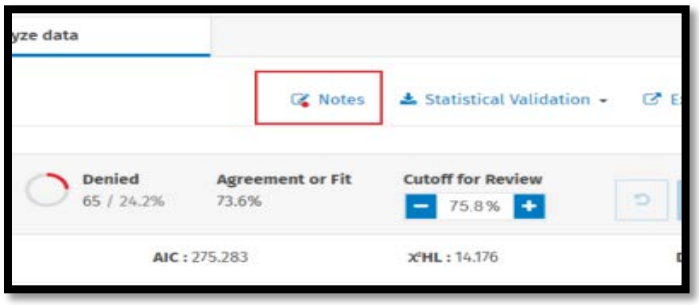
Users only need to select one prohibited basis category for export. When the software exports the data, all prohibited basis categories will be exported at once.

Adding Notes to Decisioning Regression Results

You can add notes to Decisioning Regression results that, for example, provide further clarification of results or contain a to-do item. Any notes you enter become permanently attached to results (if saved).

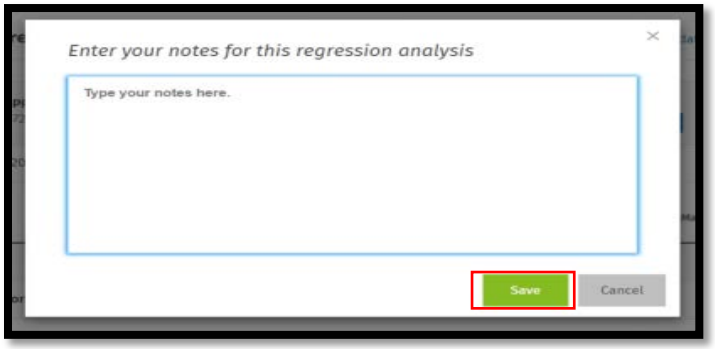
To enter notes for regression results, follow these steps

1. In the Decisioning Results screen, click the Notes link at the top of the results screen

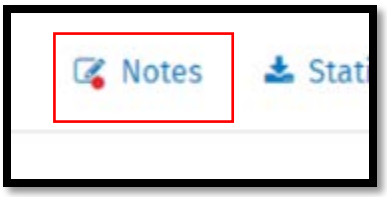


The software displays a dialog box

2. Enter notes as needed and click the save button when complete



Saved notes are indicated by a red dot in the Notes link



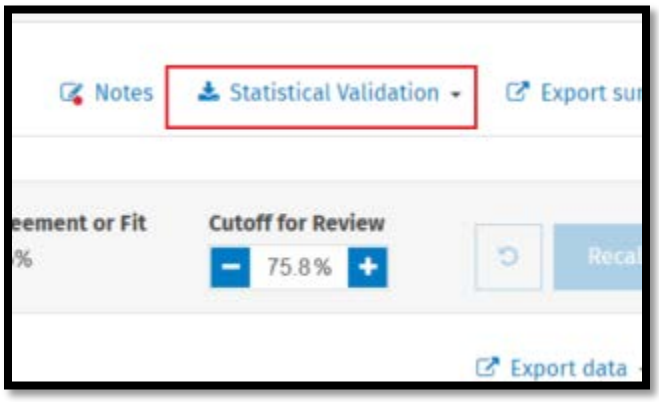
Validating Decisioning Regression Results

You can validate your Decisioning Regression model and results using either the R or SaS statistical tools. To do so, you first have to create input and command files (for either R or SaS) so that you can upload your regression information to either validation tool.

Explanations of how to use R and SaS are beyond the scope of Fair Lending *Wiz* Regression Analysis training.

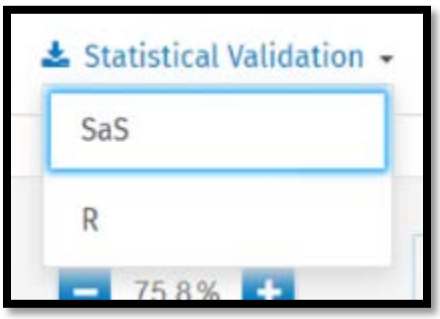
To create input and command files so you can validate your regression, follow these steps

1. In the Decisioning Regression results screen, click the Statistical Validation link

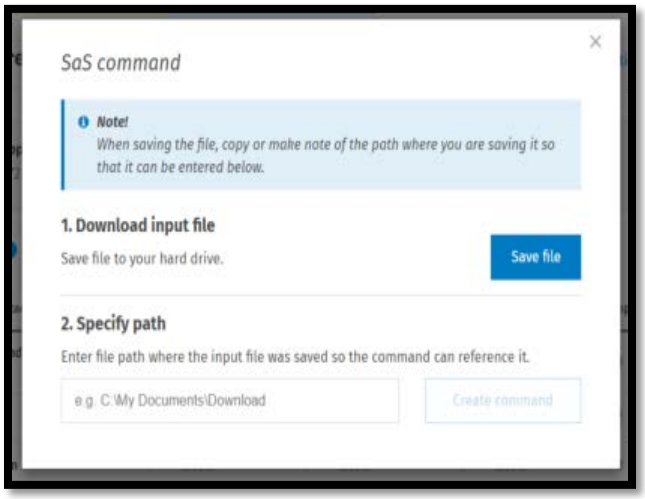


The software displays a drop-down menu

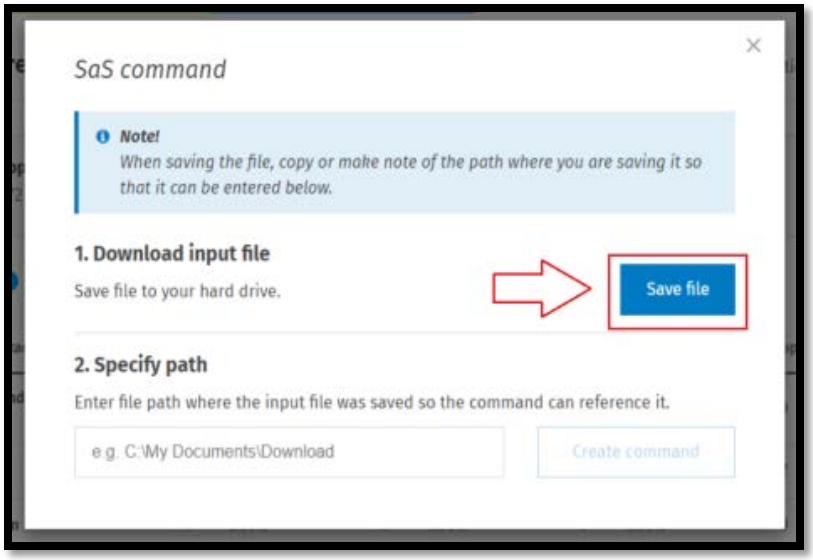
2. Select either SaS or R from the drop down



The software displays the Command dialog box



3. Click the Save file button to download the input file to your hard drive

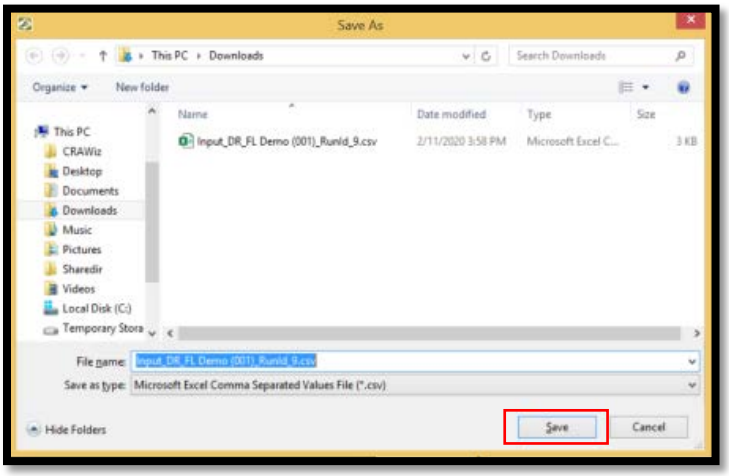


This is the file that contains all of your regression and model data. The file name and location will need to be referenced by the R or SaS command (Steps 6 and 7)

The software displays a Save As dialog box

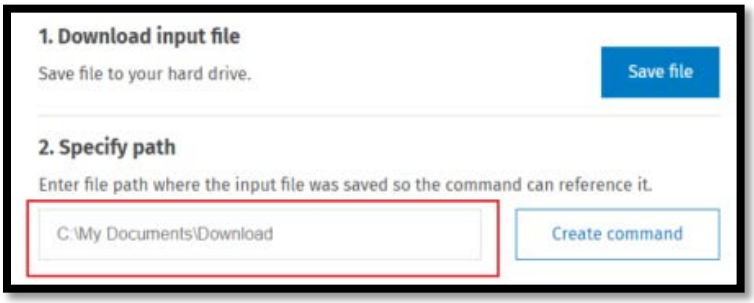
4. Use the dialog box controls to select a location to save the file and enter a name for the input file

5. Click the Save button

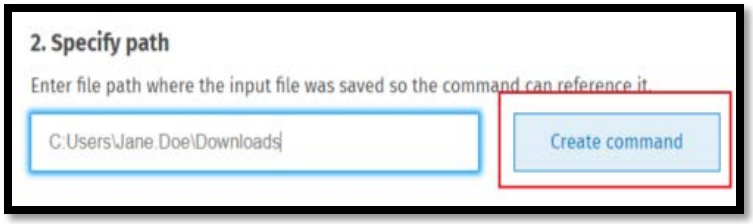


The software saves the input file to the specified location

6. In the provided text box, enter the file path where you saved the input file in Step 4

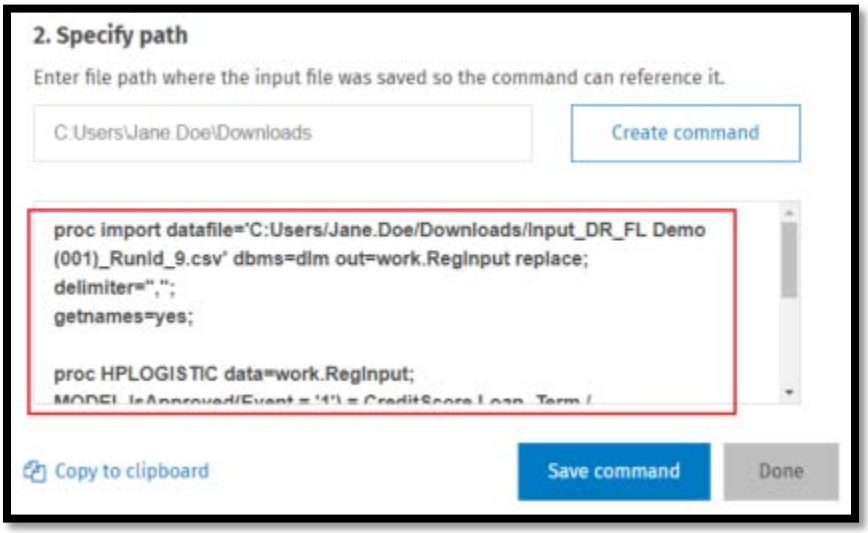


7. Click the Create command button



8. The software creates the R or SaS command and displays a preview in the dialog box

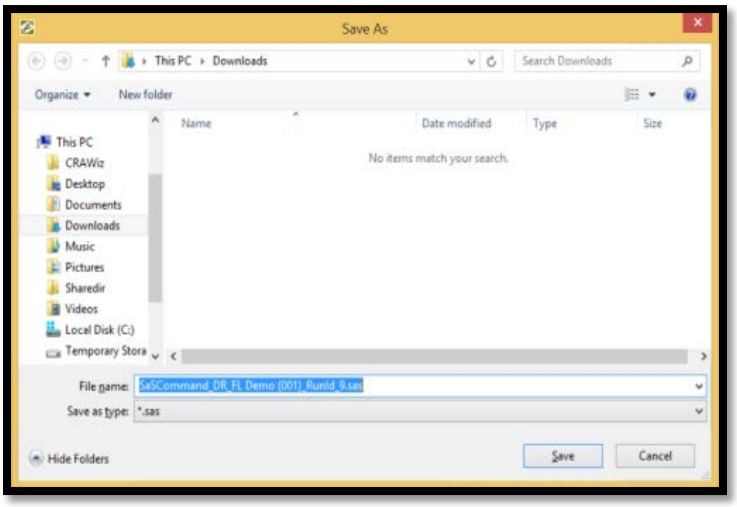
9. To save the command as a file, click the Save command button



To copy the command to your computer's clipboard (i.e., memory) for pasting into a text file or other application, click the Copy to clipboard link

The software displays a Save As dialog box

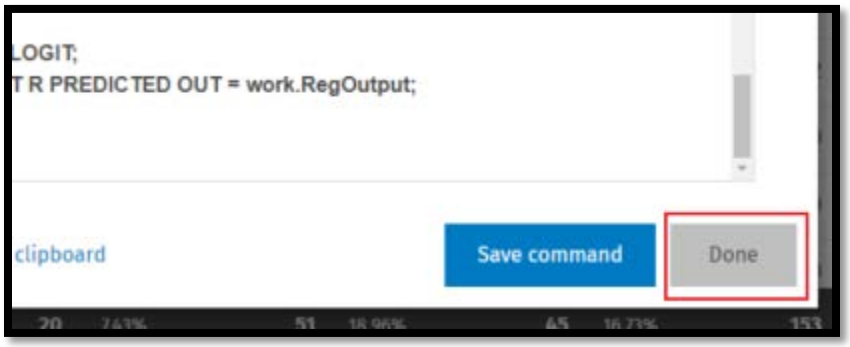
10. Use the dialog box controls to select a location to save the command file and enter a name for the file



11. Click the Save button

The software displays the Command dialog box

12. Click the Done button

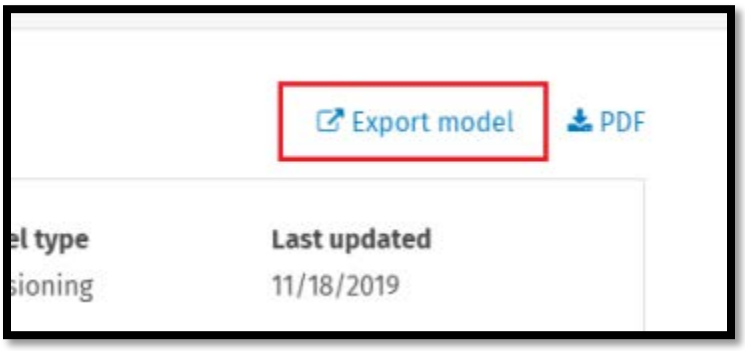


Exporting the Model

You can export a Decisioning or Pricing Regression model to a file that can then be imported and run by other CRA *Wiz* and Fair Lending *Wiz* Regression module users. The model is exported to a file type (.JSON) that contains all of the necessary configuration information, including selected factors.

To export a Regression model, do the following:

1. Click the Export model link located on the right side of the screen:



The software exports the model to a .JSON file via your Web browser

Chapter 11 – Pricing Regression Analysis

Pricing regression analysis follows the same principals and steps as Decisioning regression. However, the factors may be different in a pricing model than a decisioning model. It is important to use factors that are evident in the pricing matrix or rate sheets used by the institution.

Testing the Model

Pricing has one test, R^2 (R-Squared), for testing the effectiveness of a model, but there are other items to consider.

- R^2 (R-Squared) – This statistic indicates how useful the explanatory variables were in predicting the outcomes. Theoretically this value can approach a value of "1" if the explanatory variables explained everything that occurred in the file under review
    - Direction: Higher is generally better
- Estimated Coefficient – This is the statistical calculation of weight of the factor's influence on the pricing decision
- Degrees of Freedom – The number of factors in the model

Best Practices:

- Use a combination of the measurements above when deciding what variables to use in the model
- Look carefully at the data behind the explanatory variable to see if you can validate and understand what the results are suggesting – items that look "too good to be true" might be
- Regression modeling is not "one size fits all". You must know your data and your policies to know what is going to work for your particular situation and the data you are analyzing
- Consider maintaining an Excel Spreadsheet of the various items that you tested in your model, and what the statistics indicate about each one
- Don't include an explanatory variable just because it increases the R-Squared. The item should make sense based on the pricing guidelines

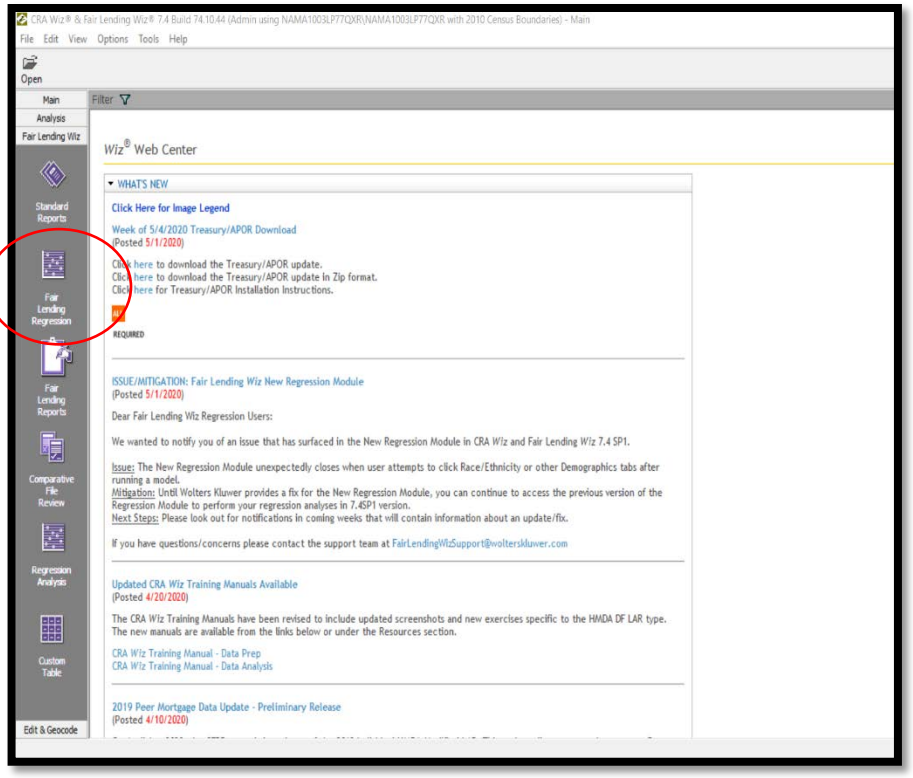
Base Model Setup and Interpretation

Start simple. Base your initial model on the explanatory variables that should, according to your pricing guidelines, make the most difference. If there are items that you want to leave out any analysis such as Employee or Business loans, the data should have a variable that identifies these circumstances so the user can filter the data for analysis.

- In Mortgage lending, a good "base" model might include credit scores, CLTV ratios, and loan term and, if available in the data, the rate type (fixed or variable)
- In Consumer lending (credit cards, unsecured lines of credit, overdraft protection plans, etc.) a good "base" model may be credit scores and loan term
    - If a product line is "Secured" then LTV might be appropriate. If not appropriate, then an indicator that it is a secured product might suffice
- In Auto lending a good base model consist of credit scores, loan term, model year (or the number of years old), and a new/used indicator

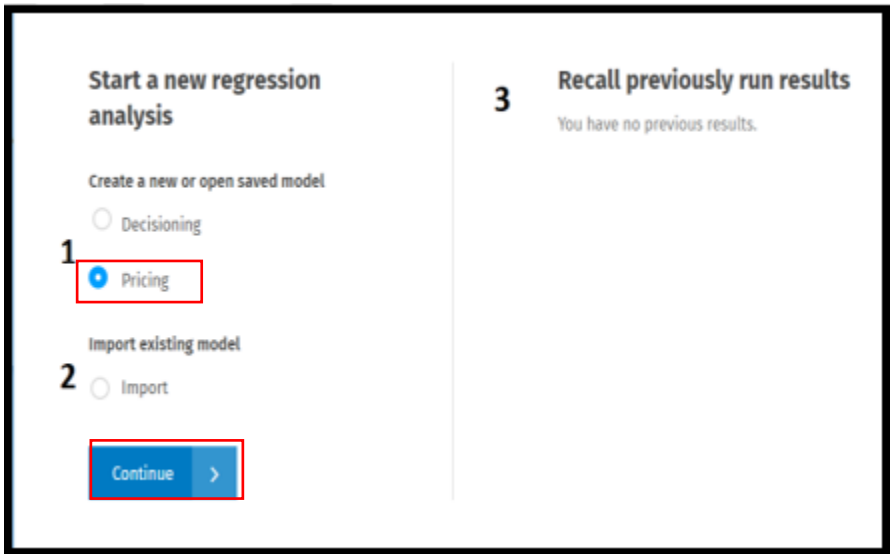
Build the model by adding each factor one at a time.

1. Click the Fair Lending Wiz tab
2. Click the Fair Lending Regression button

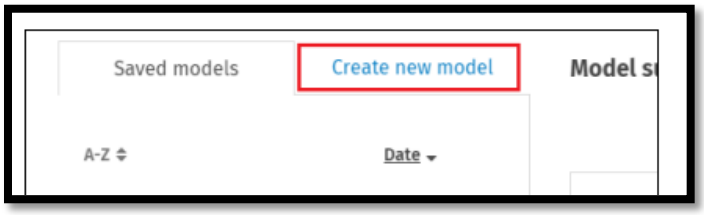


A new window will open

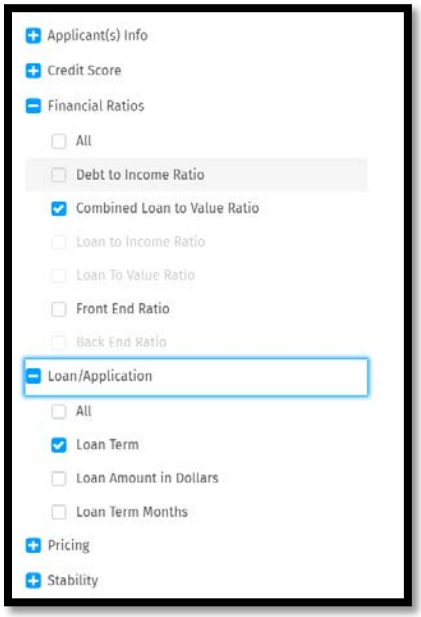
3. Click the Pricing button
4. Click continue



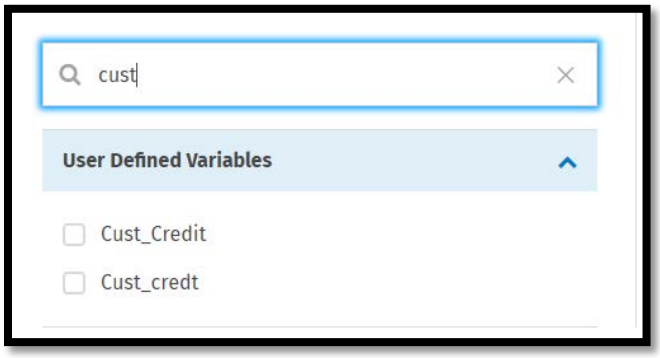
5. Click Create New Model



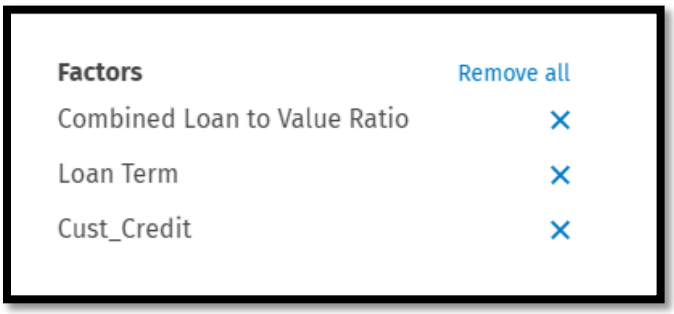
6. Select the factors to analyze by clicking the Plus Sign located next to the factor and then clicking the checkbox
    a. Start with a base model and select the credit score used in the pricing process (for training, ours is a user defined field called Cust_Credit), CLTV, and Loan Term. After you establish the base, test each additional factor by itself. After you determine which factors are best to use, you will build the model with all factors selected



You can also search for the factors using the Search bar

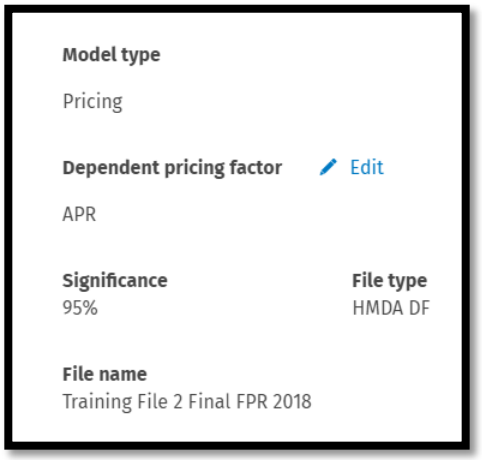


7. "Model summary" pane will display the selected factors



8. The "Dependent pricing factor" section under Model type allows you to select the pricing factor you wish to use, such as APR, interest rate, rate spread or other HMDA DF pricing factors
    a. For training purposes, APR will be used

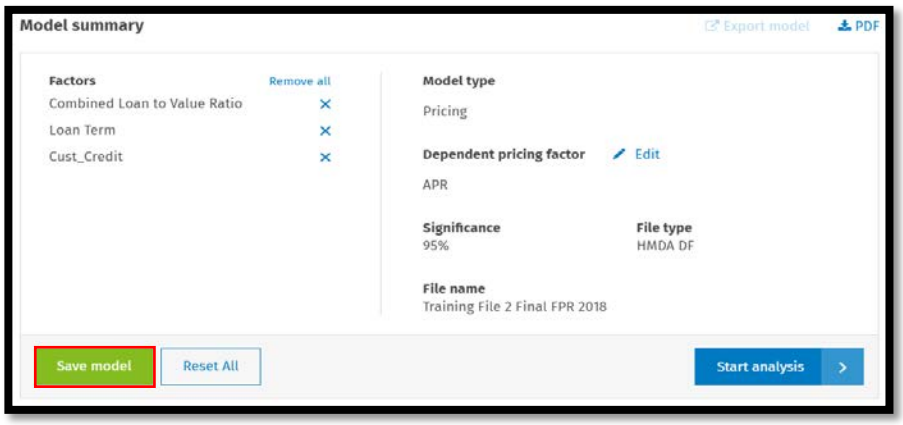
9. Significance Level is defaulted to 95%



The pricing regression module defaults the action taken that is included in the analysis to include Originated, Approved Not Accepted, and Pre-Approved Not Accepted applications. If you wish to only analyze Originated loans (which we will be doing for training purposes), be sure to include a filter to "Originated Loans" within CRA Wiz before starting regression.

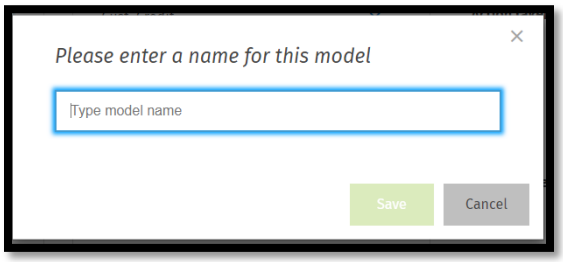
Saving Pricing Regression Model

1. To save your model, click the Save model button



The software displays a dialog box

2. Enter a name for your saved model in the provided text box



3. Click the Save button

4. The software saves your model and displays the model name after Model summary at the top of the screen

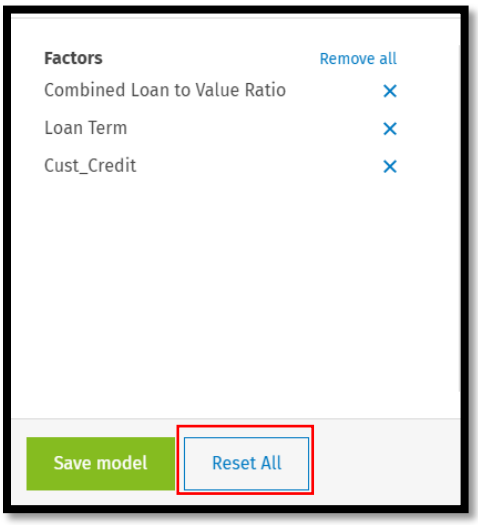
   b. If you want to change the name of your model, click the model name, edit as necessary in the provided dialog box, then click the Save button

5. To save a copy of the model using a different name, click the Save as button

The software displays a dialog box

6. Enter a name for the new model
7. Click the Save button
    b. The software displays the model name in the Model summary

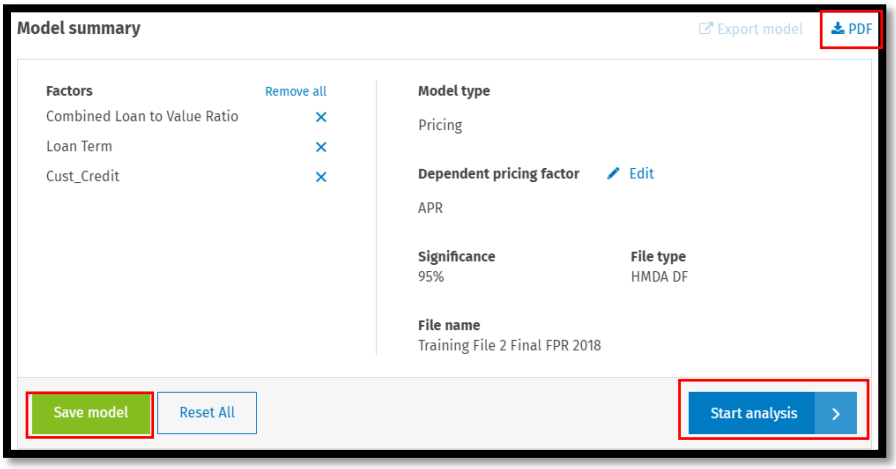
To remove all selected factors and start over, click the Reset All button



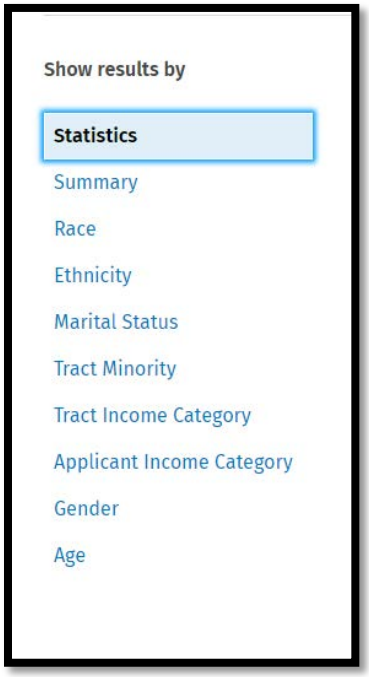
Running Pricing Regression

1. After assessing which factors to use, create the model, consider saving it and printing the Model Summary to PDF

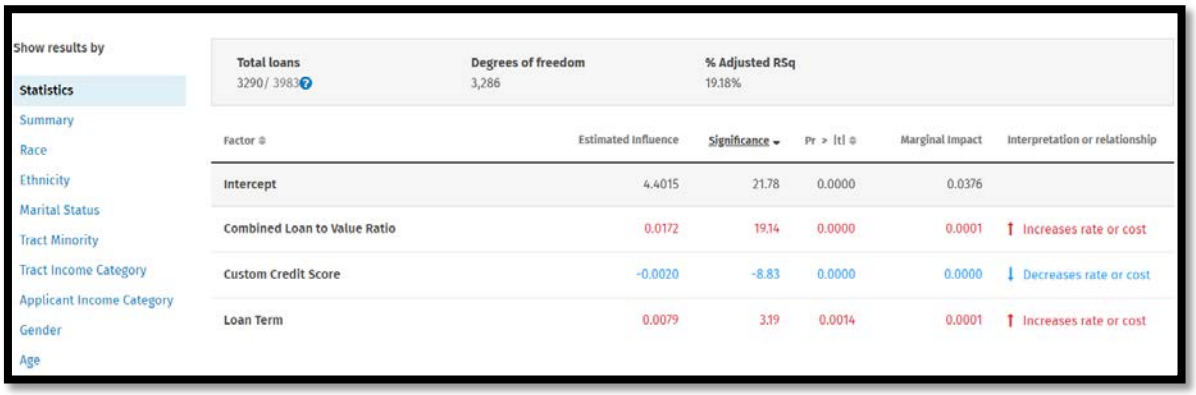
2. Then click Start Analysis



3. Once you have ran the model, you will be taken to the results screen. On the left-hand side of the screen, users can view the results by clicking on each category under "Show results by"

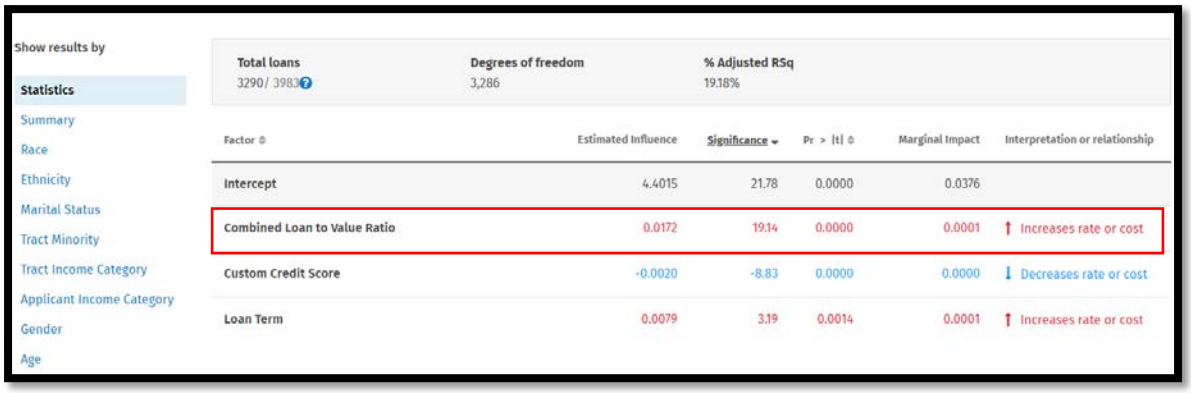


4. The Statistics Screen will display information about the model, including the statistical values of the overall model and the statistical significance of the factors used in the model



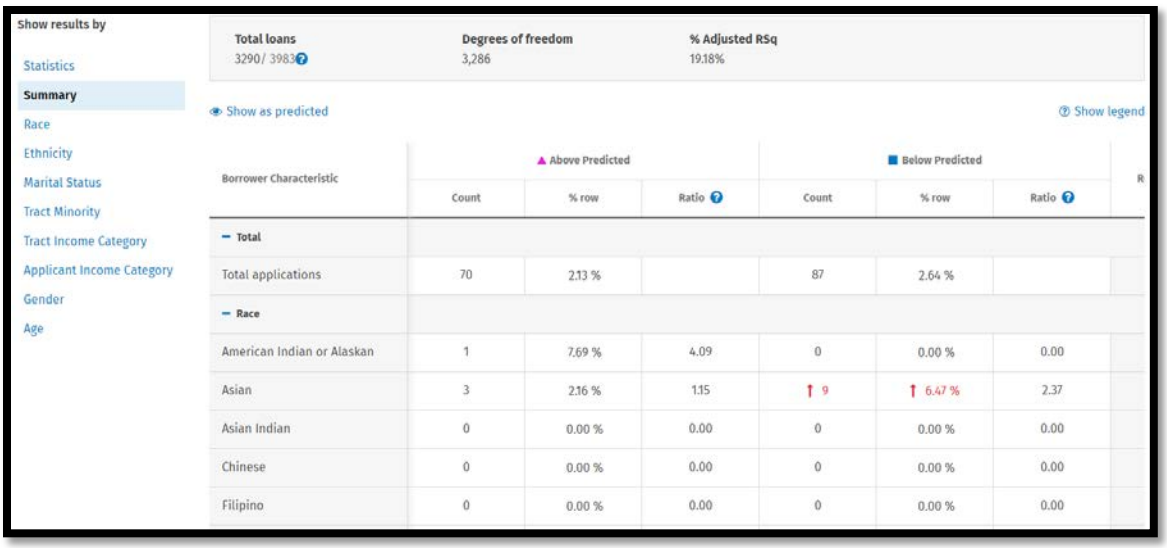
5. Consider recording the Total loans, % Adjusted R-Squared, Estimated Influence, and the Significance (T-stat), and interpretation or relationship of each factor in an excel spreadsheet or take a screenshot of the statistics to keep for your records

   As the CLTV increases the price increases. Ensure that the relationship makes sense

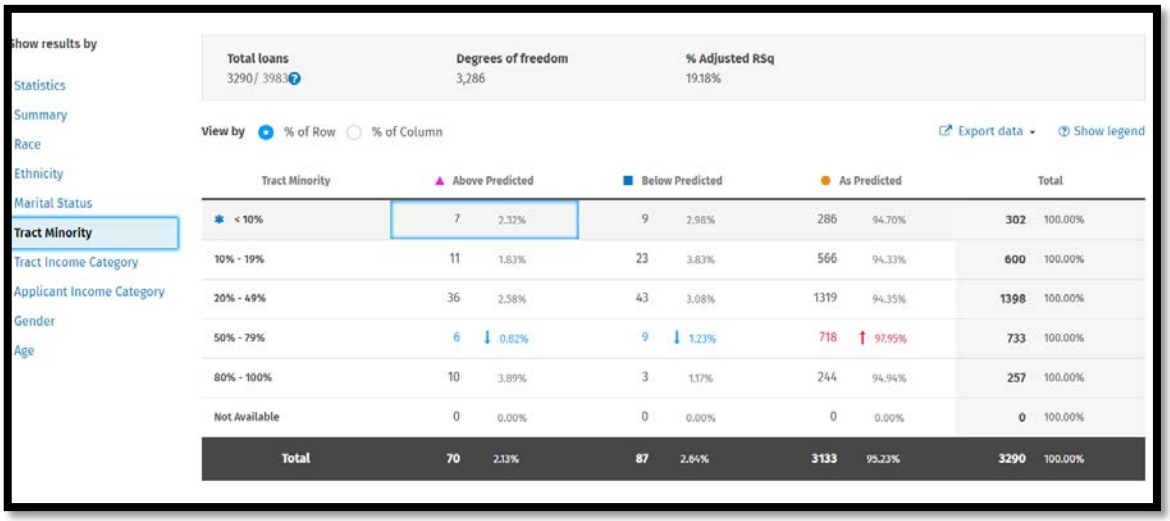


6. After the base is built, add each factor you are considering into the model one at a time. Compare the factor's information and statistics in how it affects the base model. Consider the following:
   - Run a new "base" using credit score tier instead of raw credit score. Did the results change?
   - Watch the Statistics for actual influence
   - Watch the % Adjusted R-Squared. A better model will increase the figure but do not use factors that drastically spike or decrease the figure. Do not add a value just to see the % Adjusted R-Squared rise
   - Watch the total number of records considered. A decrease in records means the data contains null values
   - If using tiers or buckets, be sure to only add one or the other, not both. If using credit score buckets, be sure to leave on bucket out as a reference bucket

7. Next, the user will click on the “Summary” option from the left-hand sidebar. This view will provide the user with the number of total loans that had pricing that was “Above Predicted” or “Below Predicted”, along with the breakdown via prohibited basis category

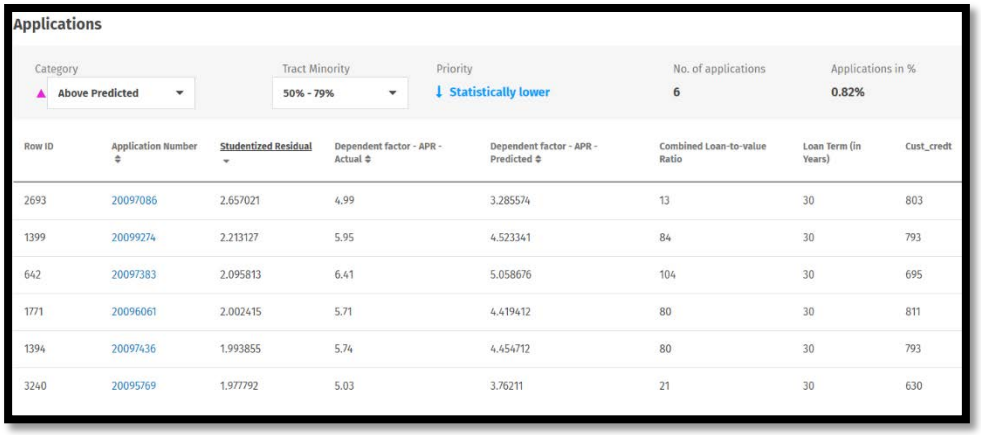


8. Then, click on each individual prohibited basis group from the left-hand side to view applications that are categorized as “Above Predicted”. Those that are statistically significant will be highlighted in either red or blue



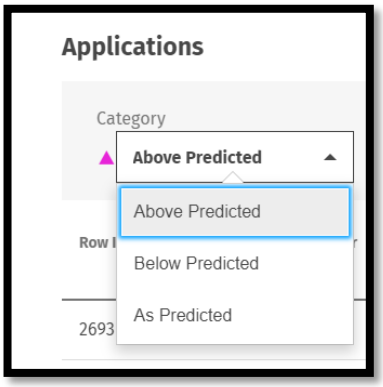
Red text indicates significantly higher than the control group. Blue text indicates significantly lower than control group. By clicking details, you will see the predicted dependent factor (APR). Groups with a higher volume of above predicted prices should be looked at first. Review for proper documentation of the price provided and ensure it matches the rate sheet.

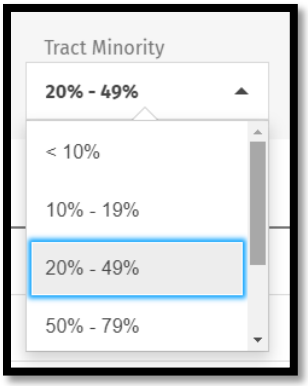
9. This will display the list of applications. For training, click on Denied & Review



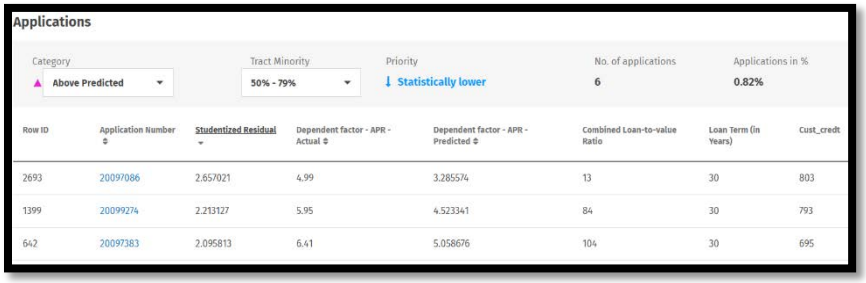
Row ID	Application Number	Studentized Residual	Dependent factor - APR - Actual	Dependent factor - APR - Predicted	Combined Loan-to-value Ratio	Loan Term (in Years)	Cust_credt
2693	20097086	2.657021	4.99	3.285574	13	30	803
1399	20099274	2.213127	5.95	4.523341	84	30	793
642	20097383	2.095813	6.41	5.058676	104	30	695
1771	20096061	2.002415	5.71	4.419412	80	30	811
1394	20097436	1.993855	5.74	4.454712	80	30	793
3240	20095769	1.977792	5.03	3.76211	21	30	630

To change which applications the software displays in the window, select new criteria from either of the provided drop-down menus located at the top of the screen. In the above example, those are Category and Tract Minority



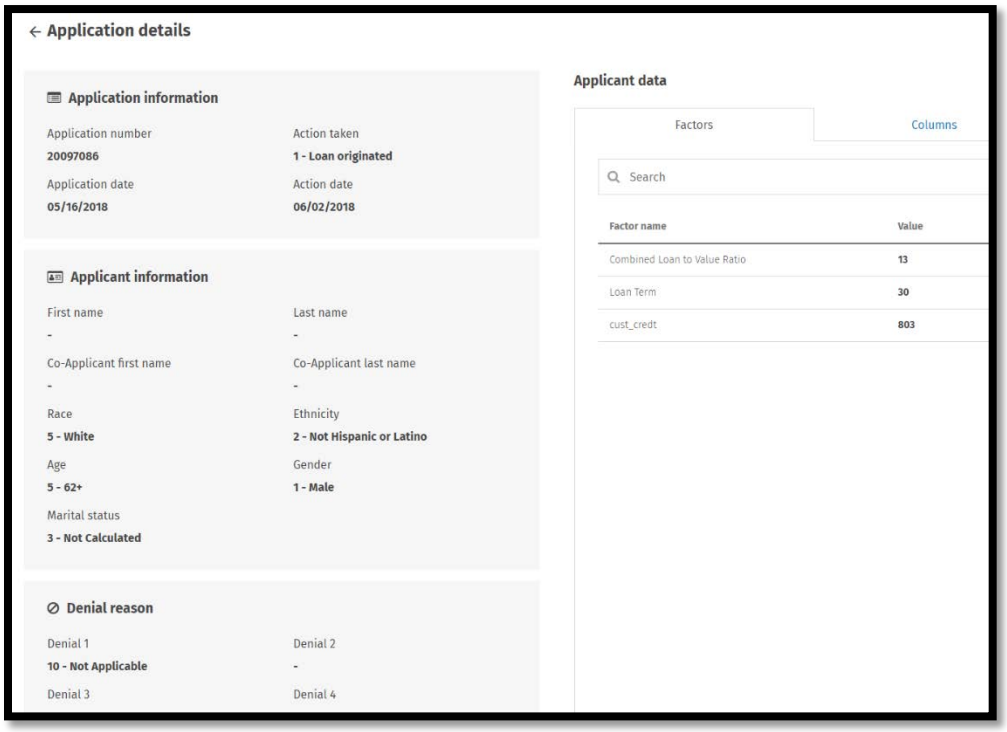


10. To view an individual application, click one of the application number links

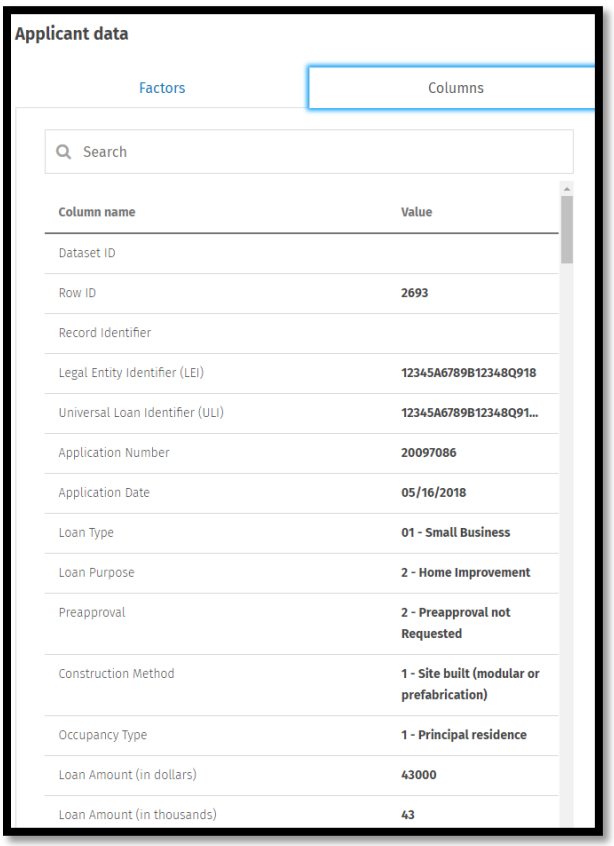


Row ID	Application Number	Studentized Residual	Dependent factor - APR - Actual	Dependent factor - APR - Predicted	Combined Loan-to-value Ratio	Loan Term (in Years)	Cust_credt
2693	20097086	2.657021	4.99	3.285574	13	30	803
1399	20099274	2.213127	5.95	4.523341	84	30	793
642	20097383	2.095813	6.41	5.058676	104	30	695

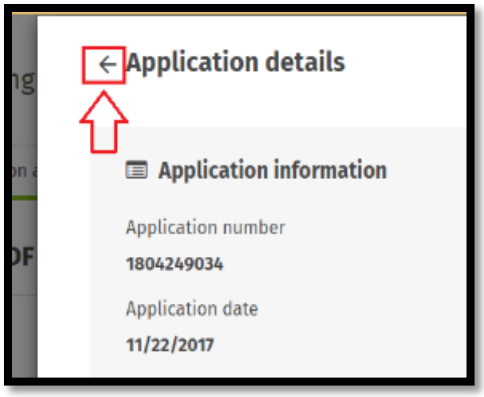
The software displays the Application details window



11. To view all of the application columns (fields), click the Columns tab located on the right side of the window



12. To return to the Applications window, click the arrow located at the top left of the screen



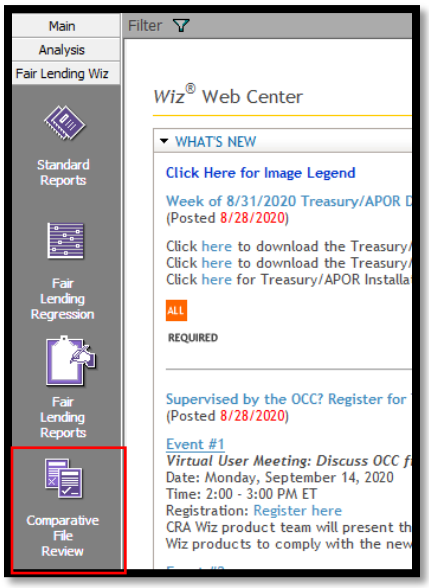
13. To close the Application details window completely and return to the results screen, click the close (X) button located at the top right of the screen

Follow the steps listed in Charter 10 for exporting the model factors, data, and results; adding notes; and validating the regression results.

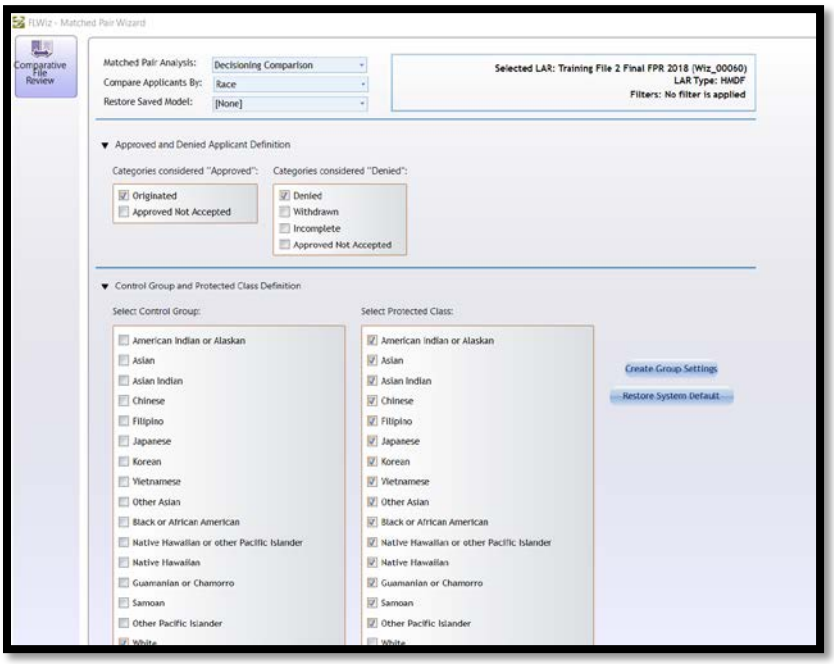
Chapter 12 – Decision Comparative File Analysis

Comparative File Review allows users to compare denied protected class applicants to similarly situated applicants who were originated. Using your underwriting factors, you will perform a test on whether an applicant was treated differently than another. The results allow users to identify potential disparate treatment risk in the portfolio.

1. Go to Fair Lending *Wiz* Tab
2. Select Comparative File Review
   a. Another window will open



3. Select **Decisioning Comparison** for Matched Pair Analysis
4. Each "Compare Applicants By: field must be selected individually. For this example, Gender is selected first
5. Select Originated and Denied for comparison categories, or select the choices applicable to your institution and data set
6. Select Control Group and Protected Class. Each group contains default settings, but users will want to review them to ensure they are set up accurately for the market and data set being analyzed

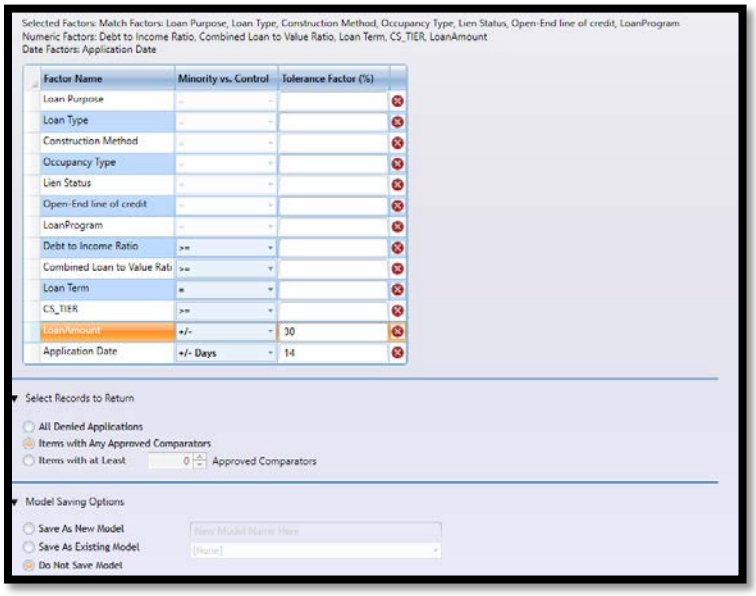


Best Practices:

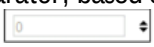
- Certain comparison factors should match, such as loan purpose and loan type (if applicable). Generally Conventional to VA would not be compared, as they have different underwriting requirements
- Other factors, such as credit score and DTIRatio, should be the same or "worse" than the prohibited basis group
- Tolerance factors can be applied to certain factors, such as loan amounts and dates, which allow the sample to be "tightened" or "loosened", which will result in smaller or larger sample sets

- Follow the lead of the regression analysis. If a factor was influential in regression, it should likely be used in Comparative File Review

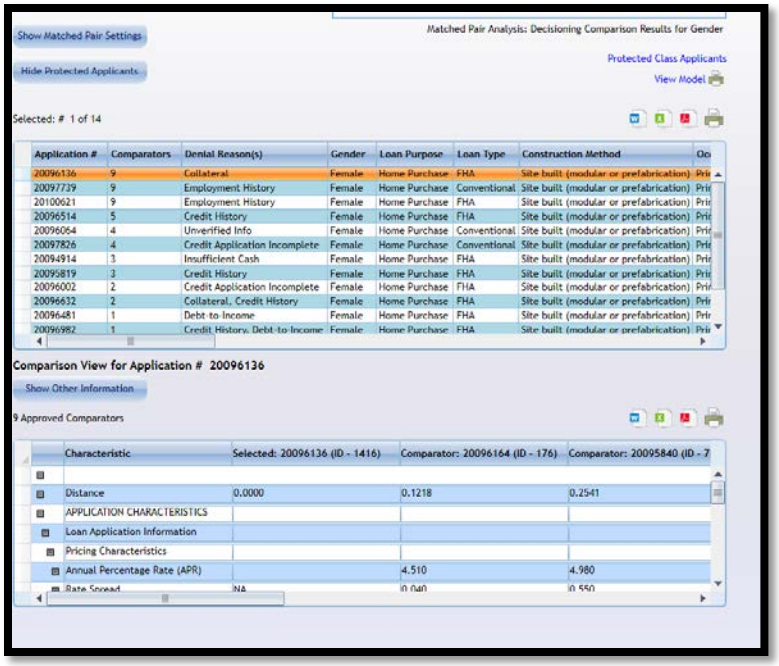
7. Select the factors that make the most sense to your underwriting policies
   a. Establish the minority vs control factor and any tolerances
8. Select Records to Return as Items with Any Approved Comparators
9. Save the "model" if desired
10. Select **Go**



Users may choose how records will be returned in the "Select Records to Return" section by selecting one of the following option buttons:

- **All Denied Applications** (Default setting)- Select to see all denied applicants and each of its comparators based on selected match and tolerance factors
- **Items with Any Approved Comparators** - Select to return only denied applicants who have at least one approved comparator, based on selected match and tolerance factors
- **Items with at Least**  **Approved Comparators** - Select to return only denied applicants who have at least the number of comparators that you specify in the provided spinner box, based on the match and tolerance factors

11. The system will return the results
    a. If you get “Error Not enough data was found with these parameters from the given LAR”, you may need to “loosen” or even remove some factors. It is unlikely that there will be no targets for comparisons
12. Users can save or print each Protected Class Applicants List, as well as each target
13. Select Show Other Information before generating each target for more detail



14. A side by side list will be produced. At a glance, you can see that the credit score of the target was higher than the comparators
15. Review the target and the compartators and compare the basis for the decline decision. In this example, the applicant was declined based on the employment history
    a. If the target was declined apprpriately, look at the comparators to see if they had the same employment history (decline reason in the example) but were approved. If so, that could be an indication that the target was potentially unfairly treated or discriminated against

Characteristic	Selected: 20100621	Comparator: 20098029	Comparator: 20099208	Comparator: 20097023
DistanceValue	0.0000	0.8975	1.9440	2.3280
Loan Application Information				
Application Date	Dec 02, 2018	Jul 07, 2018	Sep 16, 2018	May 11, 2018
Loan Type	FHA	FHA	FHA	FHA
Purpose	Home Purchase	Home Purchase	Home Purchase	Home Purchase
Loan Amount ($000s)	87.000	87.000	87.000	87.000
Loan Term	30	30	30	30
Rate Lock Date	Dec 02, 2018	Jul 08, 2018	Sep 16, 2018	May 31, 2018
Pre-Approval	Preapproval not Requested	Preapproval not Requested	Preapproval not Requested	Preapproval not Requested
Action	Application denied	Loan originated	Loan originated	Loan originated
Action Date	Dec 12, 2018	Jul 29, 2018	Oct 31, 2018	Jun 16, 2018
Denial Reason 1	Employment History	Not Applicable	Not Applicable	Not Applicable
Denial Reason 2				
Denial Reason 3				
Loan to Income Ratio	4.14	1.13	1.93	2.81
Pricing Characteristics				
Annual Percentage Rate (APR)		4.920	5.040	5.300
Rate Spread	NA	0.330	0.460	0.610
HOEPA Status	Not Applicable	Not a high cost mortgage	Not a high cost mortgage	Not a high cost mortgage
Credit Scores				
Custom Credit Score	704	650	654	695
CREDIT & FINANCIAL INFORMATION				
Gross Income ($000s)	21.000	77.000	45.000	31.000
Other Information				

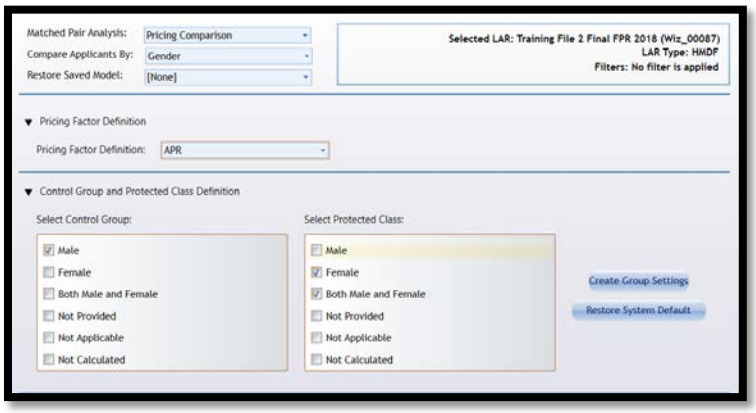
16. Continue to run the analysis against all prohibited basis categories and perform file review

Chapter 13 – Pricing Comparative File Analysis

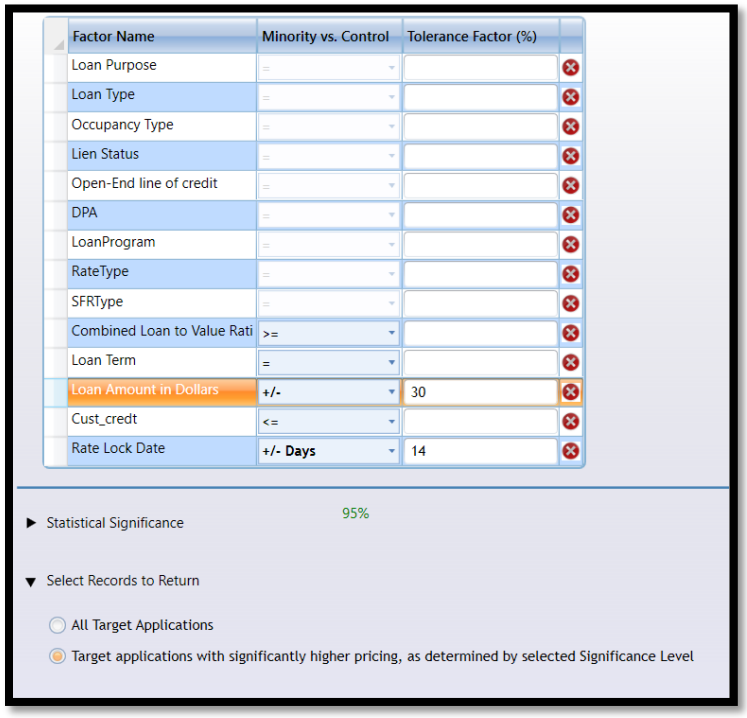
Pricing Comparative File Analysis functions similar to Decisioning Comparative File Analysis. Like in regression, the factors that you use may be different.

Build a model using the following factors:

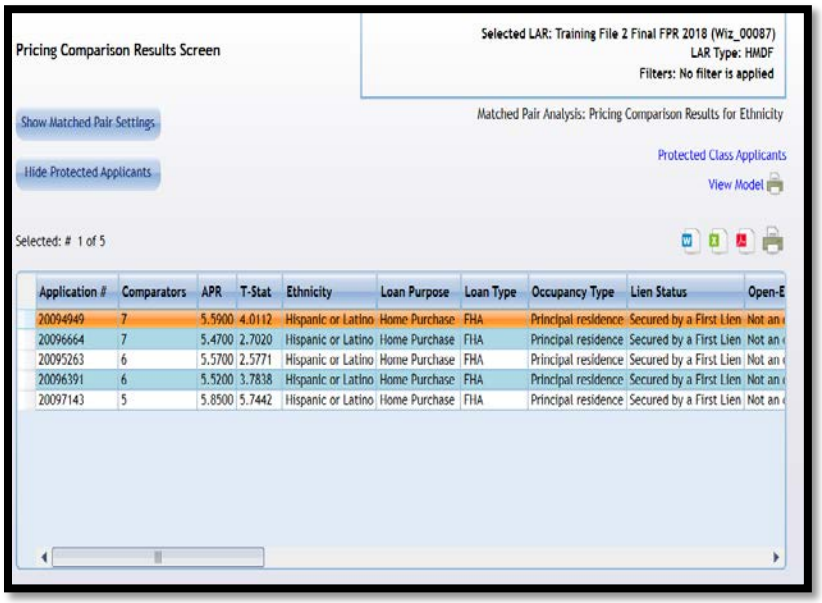
1. Select **Pricing Comparison** for Matched Pair Analysis
2. Each "Compare Applicants By: field must be selected individually. For this example, **Gender** is selected first
3. Pricing Factor Definition: Compare by **APR**
4. Select Control Group and Protected Class. Each group contains default settings, but users will want to review them to ensure each category is set up accurately for the market and data set being analyzed



5. Select the factors that make the most sense to your pricing rate sheet or matrix
   a. Establish the minority vs control factors and any tolerances
   b. For this exercise use the following factors
6. Select Records to Return as **"Target applications with significantly higher pricing, as determined by selected Significance Level"**
7. Save the "model" if desired
8. Select **Go**



9. The system will return the results
    a. If you get "Error Not enough data was found with these parameters from the given LAR", you may need to "loosen" or even remove some factors. It is unlikely that there will be no targets for comparisons



Application #	Comparators	APR	T-Stat	Ethnicity	Loan Purpose	Loan Type	Occupancy Type	Lien Status	Open-E
20094949	7	5.5900	4.0112	Hispanic or Latino	Home Purchase	FHA	Principal residence	Secured by a First Lien	Not an
20096664	7	5.4700	2.7020	Hispanic or Latino	Home Purchase	FHA	Principal residence	Secured by a First Lien	Not an
20095263	6	5.5700	2.5771	Hispanic or Latino	Home Purchase	FHA	Principal residence	Secured by a First Lien	Not an
20096391	6	5.5200	3.7838	Hispanic or Latino	Home Purchase	FHA	Principal residence	Secured by a First Lien	Not an
20097143	5	5.8500	5.7442	Hispanic or Latino	Home Purchase	FHA	Principal residence	Secured by a First Lien	Not an

10. Users can save or print each Protected Class Applicants List, as well as each target
11. Select Show Other Information before generating each target for more detail

12. A side by side list will be produced. At a glance, you can see that the credit score of the target was higher than the comparators
13. Review the target and the comparators' files and compare the basis for the pricing decision. If it cannot be explained, the target may have potentially been unfairly treated or discriminated against
14. Continue to run the analysis against all prohibited basis categories and perform file review

Characteristic	Selected: 20094949	Comparator: 20095778	Comparator: 20095831	Comparator: 20095620	Comparator: 20095706	Comparator: 20094902	Comparator: 20095367	Comparator: 20095656
DistanceValue	0.0000	0.0247	0.0258	0.0505	0.0741	0.0346	0.0648	0.0556
Loan Application Information								
Application Date	Nov 20, 2017	Feb 09, 2018	Feb 17, 2018	Jan 25, 2018	Feb 09, 2018	Nov 18, 2017	Jan 06, 2018	Feb 04, 2018
Loan Type	FHA	FHA	FHA	FHA	FHA	FHA	FHA	FHA
Purpose	Home Purchase	Home Purchase	Home Purchase	Home Purchase	Home Purchase	Home Purchase	Home Purchase	Home Purchase
Loan Amount ($000s)	81.000	73.000	86.000	94.000	105.000	88.000	102.000	99.000
Loan Term	30	30	30	30	30	30	30	30
Rate Lock Date	Feb 03, 2018	Feb 15, 2018	Feb 17, 2018	Feb 01, 2018	Feb 08, 2018	Jan 27, 2018	Feb 08, 2018	Feb 04, 2018
Pre-approval	Preapproval not Requested	Preapproval not Requested	Preapproval not Requested	Preapproval not Requested	Preapproval not Requested	Preapproval not Requested	Preapproval not Requested	Preapproval not Requested
Action	Loan originated	Loan originated	Loan originated	Loan originated	Loan originated	Loan originated	Loan originated	Loan originated
Action Date	Mar 11, 2018	Mar 21, 2018	May 25, 2018	Apr 08, 2018	Mar 07, 2018	Mar 24, 2018	Feb 14, 2018	Mar 08, 2018
Denial Reason 1	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Denial Reason 2								
Denial Reason 3								
Loan to Income Ratio	2.45	3.65	3.19	2.76	2.14	1.40	1.79	1.27
Pricing Characteristics								
Annual Percentage Rate (APR)	5.590	4.900	4.910	4.940	5.060	5.170	5.460	5.690
Rate Spread	1.440	0.530	0.540	0.750	0.860	1.080	1.200	1.500
HOEPA Status	Not a high cost mortgage	Not a high cost mortgage	Not a high cost mortgage	Not a high cost mortgage	Not a high cost mortgage	Not a high cost mortgage	Not a high cost mortgage	Not a high cost mortgage
Credit Scores								
Custom Credit Score	704	663	654	689	686	679	641	681
CREDIT & FINANCIAL INFORMATION								
Gross Income ($000s)	33.000	20.000	27.000	34.000	49.000	63.000	57.000	78.000
Other Information								
Address	2199 CRUSE ROAD	11 GREEN ELM WAY	205 GRAYLAND CREEK DRIVE	3323 GLYNN MILL DR.	331 THORNBUSH TRACE	6511 COWAN MILL ROAD	4301 WREXHAM COURT	215 LEE ROAD 600
Age	29	20	35	27	28	20	32	46
Age NA								

Chapter 14 – Demographic and Redlining Maps

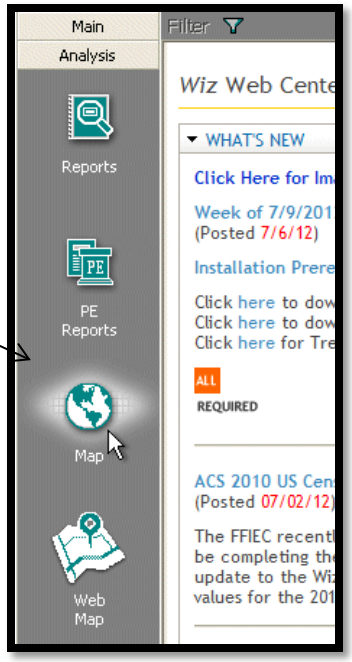
Mapping in CRA Wiz is a valuable tool that helps institutions compliment their fair lending analysis. There is a variety of data available in CRA Wiz, including business, product, economic, projected business, and geodemographic data. You can use this data to create a map of a specific geographic area.

The geographic area you use for your map can either be an existing assessment area or the area for which you have activity in your current file, all the areas in which your institution has loans, or a geographic area you define.

Accessing the Mapper

To access the **Mapper**, follow these steps:

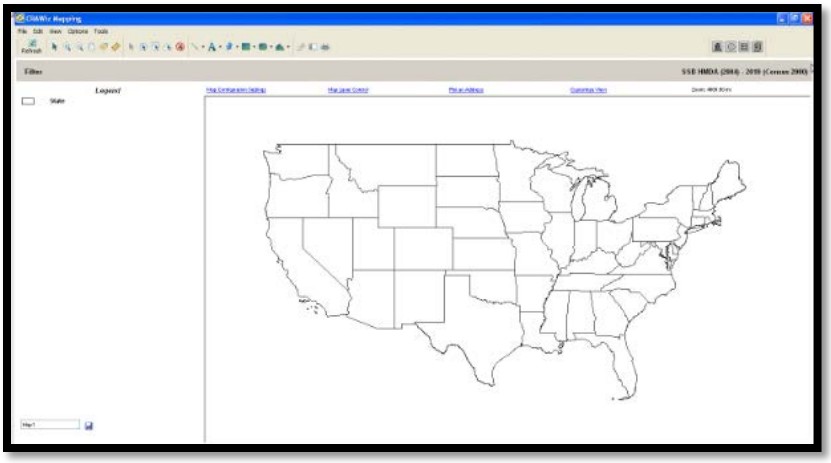
1. Click the **Analysis** tab.



The software displays the **Analysis** view bar.

2. Click the **Map** button.

The software displays the **Mapper** main screen in a separate window:

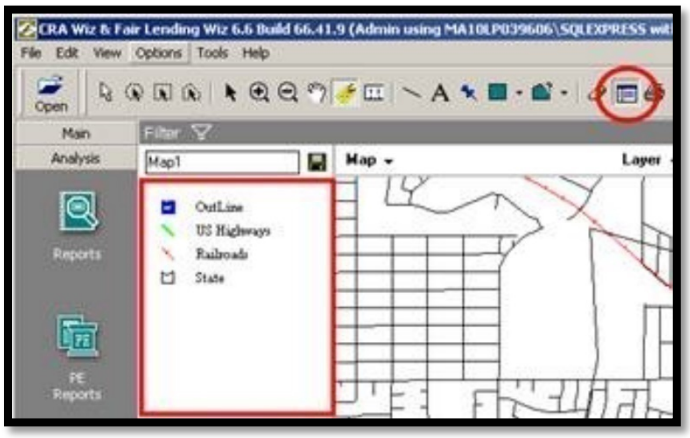


The map image will default to the region of mapping data that you have installed.

Mapper Toolbar

- **Select** – Selects features on a map
- **Select Radius** – Draws a radius on the map in which all features within the area will be selected
- **Select Marquee** – Draws a rectangle on the map in which all features within the area will be selected
- **Select Polygon** – User draws a polygon on the map in which all features within the area will selected
- **Pointer** – The Pointer allows the mouse to become an arrow to point to features on the map, as well as select items like user defined text
- **Zoom In** – Works two ways: by selecting this tool a user can either click a spot on the map to zoom in or hold down the left mouse button to select an area (rectangle/square) to zoom in
- **Zoom Out** - Works in two ways: by selecting this tool a user can either click a spot on the map to zoom out of or hold down the left mouse button to select an area (rectangle/square) to zoom out
- **Pan** – Used to navigate around the map. The user can click and drag the "hand" to change the area of the map that displays
- **Label** – Allows the user to manually add labels to features on a map
- **Ruler** – Measures distance on the map. The user selects this option and clicks anywhere on the map. Holding the cursor down the user drags the cursor the distance they wish to measure (creating a dotted line on the map). In the upper right-hand corner of the display where the Zoom is shown, CRA *Wiz* displays the distance in miles
- **Insert Line Button & Drop Down Menu** – Used to draw a user defined line on the map. User left clicks at 'Point A' to start drawing a link then drags the mouse to 'Point B' where they want the line to end
- **Insert Text Button & Drop Down Menu** - Used to insert user defined text on the map. User selects this button and then clicks the spot on the map where text is desired. A text box appears on the map for the user to insert text
- **Insert Symbol Button** - Used to draw a user defined symbol on the map. User selects this button then clicks the spot on the map where symbol is desired
- **Insert Rectangle Button** - Used to draw a user defined rectangle on the map. User selects this button and then left clicks the map in one corner of the desired rectangle and drags the mouse to the diagonal corner of the desired rectangle. When the user releases the mouse button, the rectangle is displayed
- **Insert Polygon Button & Drop Down Menu** - Used to draw a user defined polygon on the map. User selects this button and then begins to draw their desired polygon by clicking on a point of the desired outline. The user continues to click additional nodes of the polygon, expanding the polygon based on the new parameters. To finish the polygon, the user double clicks (rather than a single click to continue changing the parameters of the polygon)
- **Clear Manual Label** – Used to clear all manually added labels from the map

- **Side Legend** – Controls whether the Legend is displayed in the left margin of the map view. This button is set to 'True' by default. If the Side Legend button is set to 'False' by the user, the map should take up the entire display area with no legend present
- **Print** – Used to generate a map layout that can be customized for printing



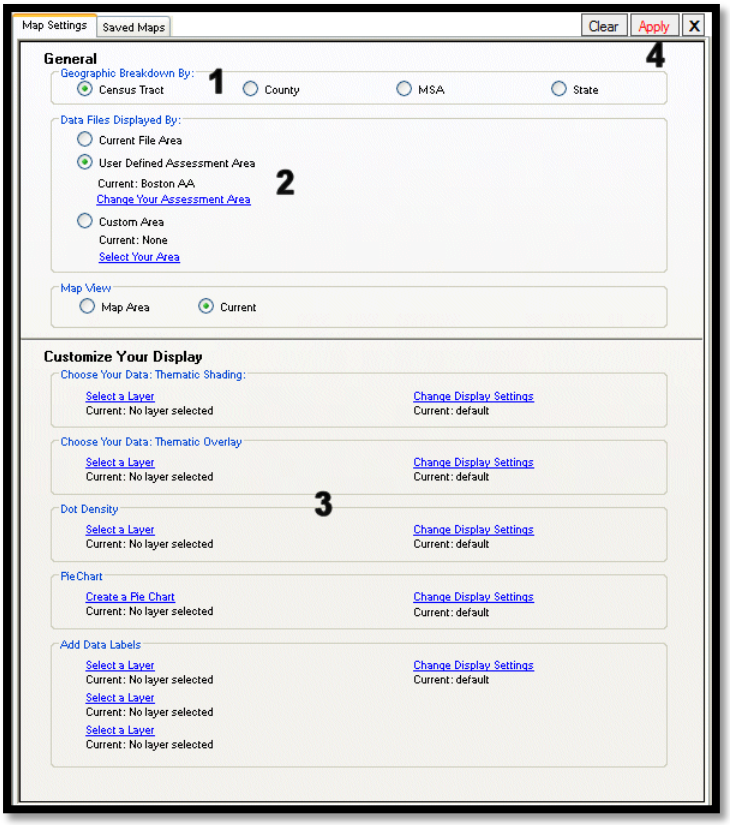
Creating a Map of an Assessment Area

You can use CRA Wiz to create a map of an assessment area, and can enhance the display of information on the map by adding layers such as:

- **Boundary layers** - these include MSAs, congressional districts, bodies of water, and parks
- **Linear layers** - these include railroad tracks and roads
- **Point layers** - these indicate the location of airports, places of worship, and schools
- **Themes** - add or remove themes from the map

Navigating the Mapper

To set map parameters, the Map Settings pane includes the following options:

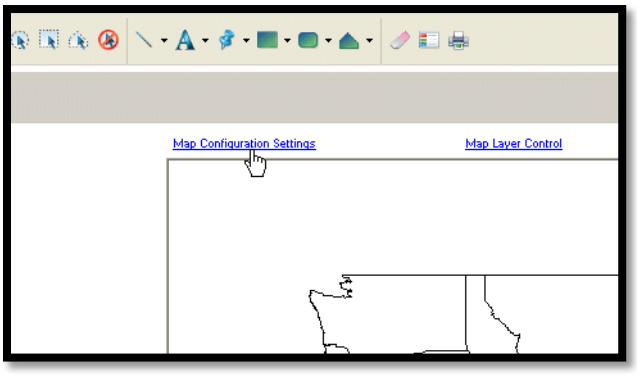


- **Geographic Breakdown** - (1) - Use the options in the **Geographic Breakdown By** section of the Map Settings pane to select the geographic level to display map information--Census Tract, County, State, or MSA
- **Selecting Area** - (2) - Use the options in the **Data Files Displayed By** section of the **Map Settings pane** to display geographic information by the current file area, a previously saved assessment area, or by defining a custom assessment area
- **Adding Themes** - (3) - Use the options in the **Customize Your Display** section of the **Map Settings pane** to add thematic information to a map including thematic shading, thematic overlay, dot density, pie charts, or data labels
- **Apply button** – (4) After configuring all the necessary map parameters in the **Map Settings pane**, apply the changes to the map using the **Map Settings Apply** button

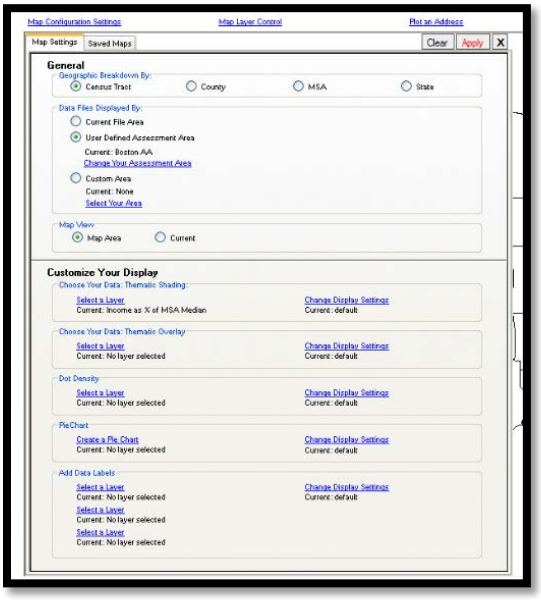
Accessing Map Settings Pane

You use the Map Settings pane to select a geographic area for a map. To access the Map Settings pane, do the following:

1. On the Mapper main screen, click the **Map Configuration Settings** link



The software displays the Map Settings pane:

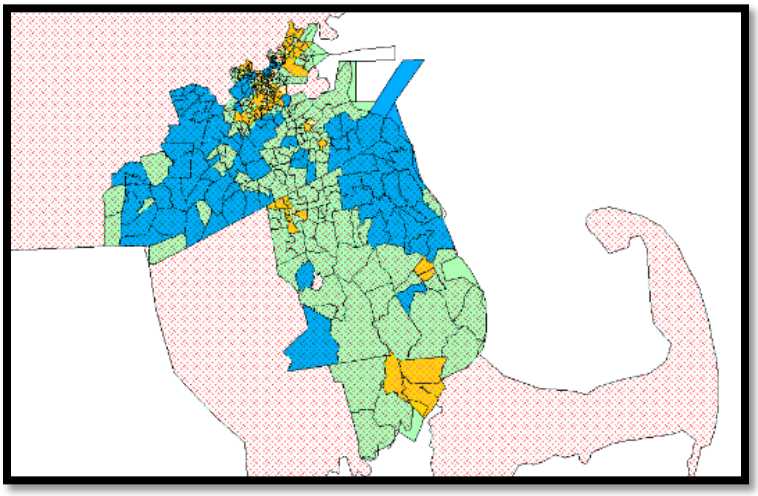


Selecting Geographic Breakdown

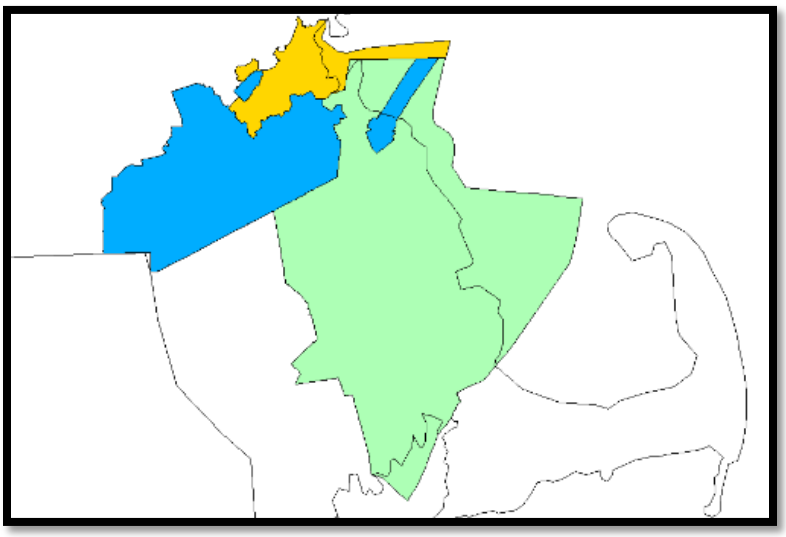
Use the options in the **Geographic Breakdown By** section of the General panel of the Map Settings pane to select the geographic level at which the map displays information for an area:

To select a geographic breakdown, in the **Geographic Breakdown By** panel of the Map Settings pane, select one of the following option buttons:

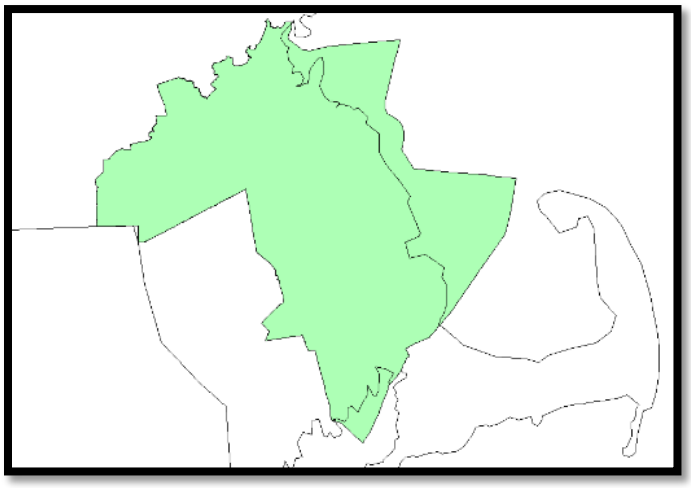
- **Census Tract**: creates a map that includes census tract boundaries and will be the setting used for this example



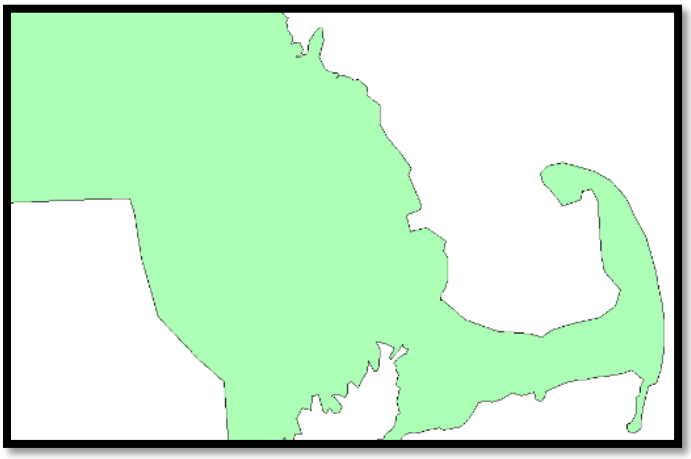
- **County**: creates a map that includes only the county boundaries



- **MSA**: creates a map that only includes the MSA boundaries



- **State**: creates a map that only includes the State boundaries



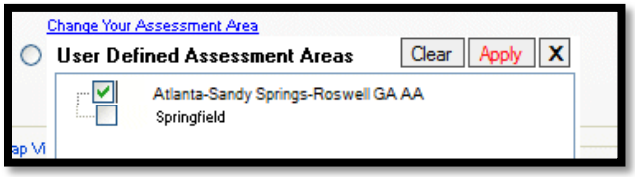
Selecting Area

Use the options in the **Data Files Displayed By** section of the General panel of the Map Settings pane to define the specific geographic area to display on the map:

- **Current File Area** - Displays data for geographic areas in which your institution had loan activity, based on the currently active file in the system
- **User Defined Assessment Area** - Displays geographic data for a Saved Assessment Area
- **Custom Area** - Displays geographic data for areas (states, MSAs, counties, census tracts) selected

1. In the **Data Files Displayed By** section of the General panel of the Map Settings pane, click the **Change Your Assessment Area** link

The software displays the User Defined Assessment Areas pane.



2. From the list of saved areas, select the area for which you want to display a map. For this example only one area is selected, but multiple areas can be selected at one time

The list of saved areas the software displays is based on the current Census Year selection. For example, if Census Year is set to 2010, the software displays only those saved assessment areas associated with the 2010 Census Year.

Adding Themes

Use themes to create geographical representations showing the distribution and relationship of the information your institution maintains in your data files within the geographic areas your institution serves.

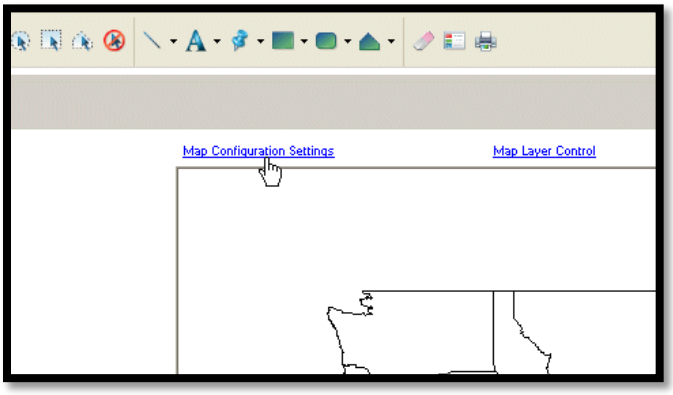
Themes include the following:

- **Thematic Shading** - Represented with geographies, for example: census tracts, being shaded various colors on the map
    - By default, the system uses a regulator suggested color palette for displaying map theme ranges
    - For more information, refer to the description of the Style tab in Modifying Existing Themes
- **Thematic Overlay** – Represented with geographies, for example: census tracts, displaying with crosshatches or other transparent patterns on a map
- **Dot Density** – Represented with geographies being populated with dots to represent the presence of selected demographic information within the area. Can be configured based on display preferences, for example 1 dot = 1 loan or 1 dot = 100 loans
- **Pie Chart** - Display lending or demographic variables in pie chart form. You can select up to six variables per type
- **Data Labels** - Provides count of a variable in a Census Tract. You can apply up to three labels per type

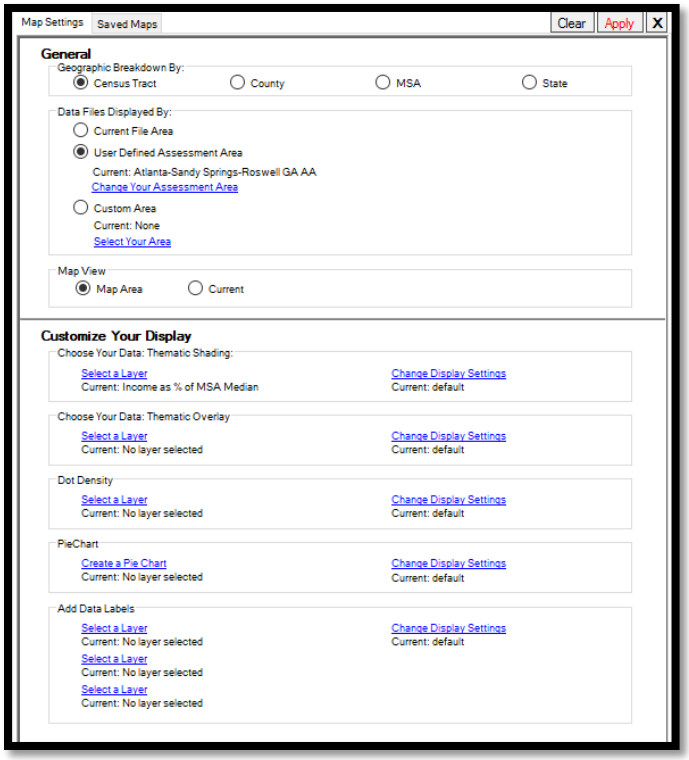
Adding Thematic Shading

For training, add thematic shading to a map:

1. Click the **Map Configuration Settings** link

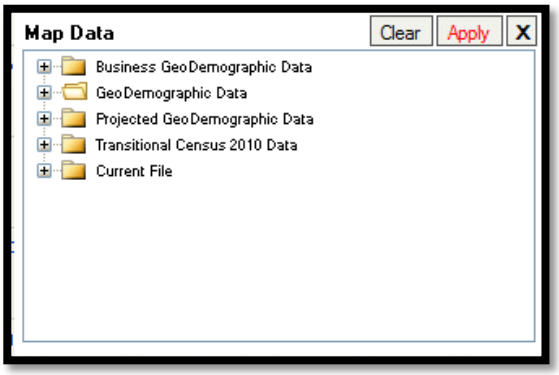


The software displays the Map Settings pane.



2. In the **Customize Your Display** pane, click the **Select a Layer** link located under the **Choose Your Data: Thematic Shading** section

The software displays the Map Data pane.



Use the tree view to select the data you want to display on the map.

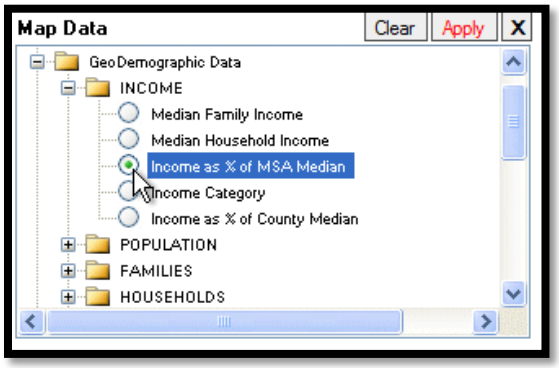
3. Select the **GeoDemographic Data** folder

The software displays the contents of the **GeoDemographic** folder.

4. Select the **Income** folder

The software displays the themes available in the Income folder.

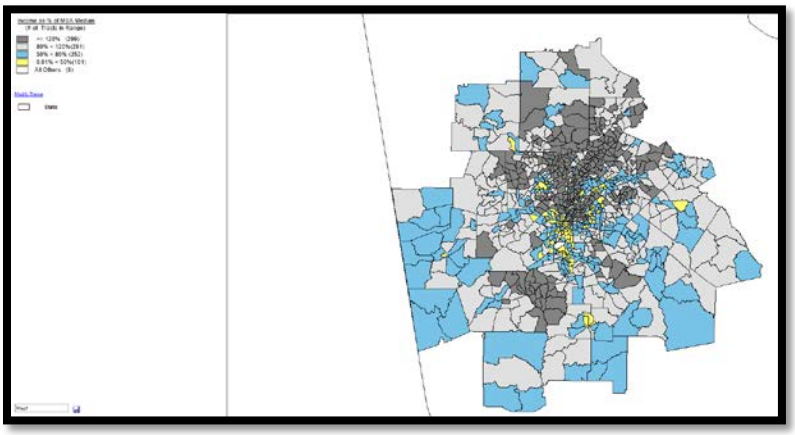
5. Select **Income as % of MSA Median**
   a. Click **Apply**



Income Category is another option to use to display tract income categories.

The software displays the Map Settings pane.

6. Click **Apply** located at the top-right of the Map Settings pane
   a. Thematic shading is added to the map (Income as % of MSA Median)
   b. Income as % of MSA Median ranges are added to the side legend



While reviewing the legend the four income ranges defined by government regulation (low, moderate, middle, and upper) are displayed. The number in parentheses is the number of census tracts in each range. There may be a fifth category listed, All Others. All Others represents tracts that do not have households with reportable income.

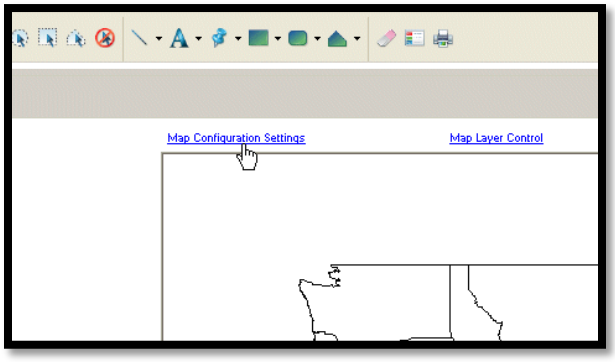
There are several reasons why this might be the case, including:

- No family income data
- No population with families
- No population (for example, the entire census tract might be an airport)

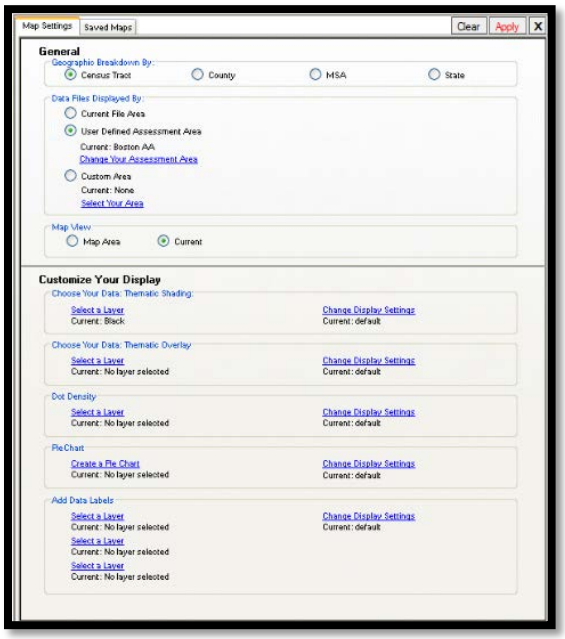
Adding Thematic Overlay

To add a thematic overlay to a map, follow these steps:

1. Click the **Map Configuration Settings** link

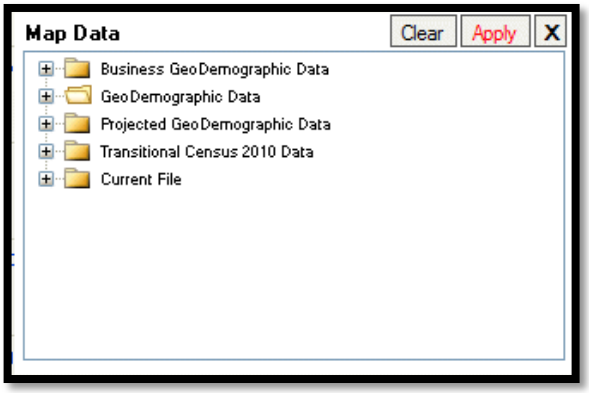


The software displays the Map Settings pane.



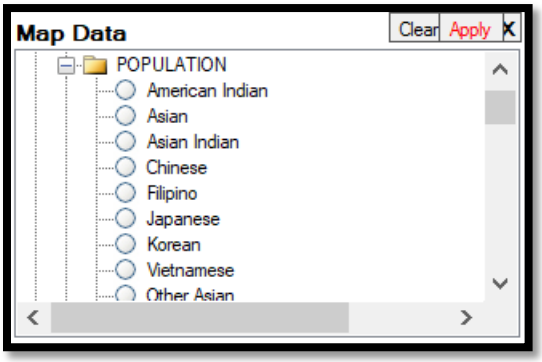
2. In the **Customize Your Display** pane, click the **Select a Layer** link located under the **Choose Your Data: Thematic Overlay section**

The software displays the Map Data pane.



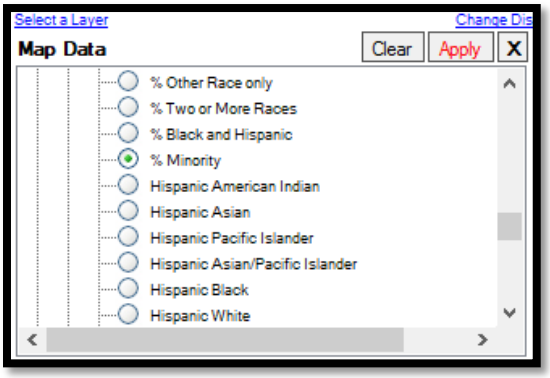
3. Use the tree view to select the data you want to display on the map. For this example, select the **GeoDemographic Data** folder

4. Select the **Population** folder

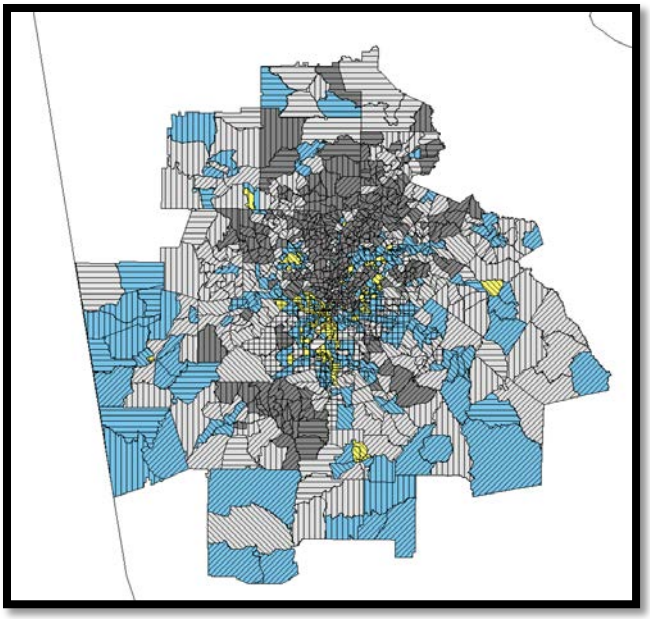


The software displays the themes available in the Population folder.

5. Select **% Minority**
6. Click **Apply**
   a. The software displays the Map Settings pane
7. Click **Apply** located at the top-right of the Map Settings pane



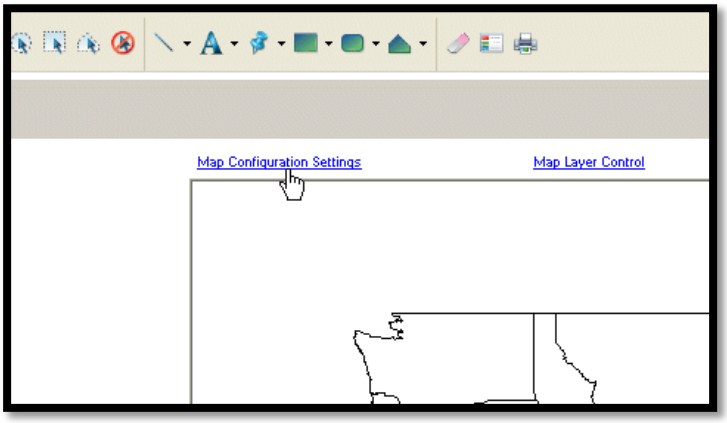
8. The following items are added to the map:
   a. Thematic overlay
   b. Associated ranges to the legend



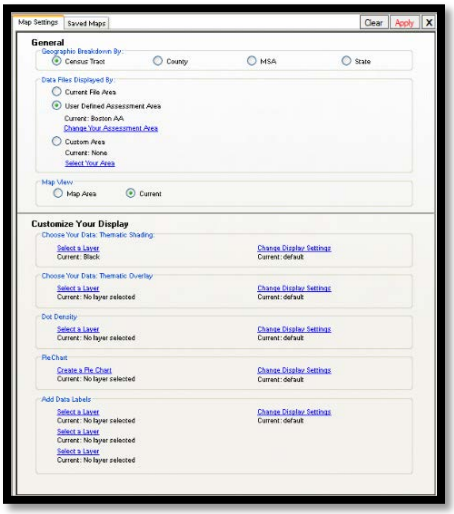
Adding Dot Density

To add dot density data to a map, follow these steps:

1. Click the **Map Configuration Settings** link

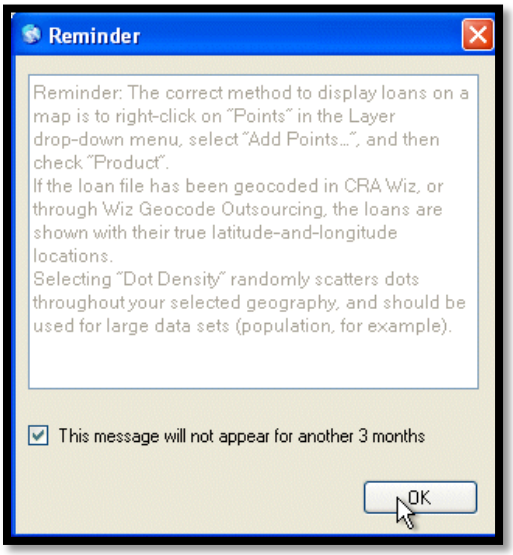


The software displays the Map Settings pane.



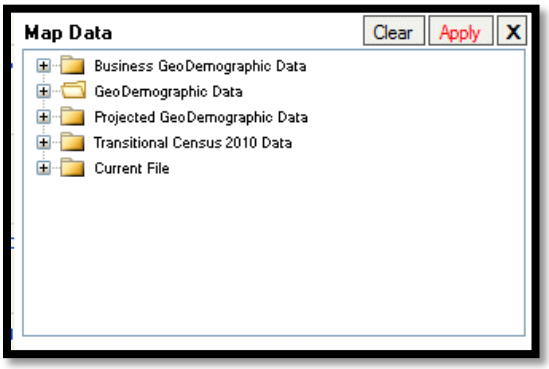
2. In the **Customize Your Display** pane, click the **Select a Layer** link located under the **Dot Density** section

The software displays a Reminder dialog box indicating that dot density themes should be used only for displaying large data sets and is not recommended for displaying loans.

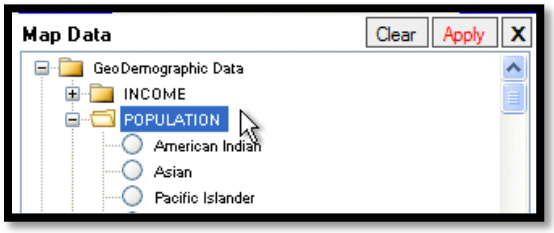


3. To disable this message for three months, click the 'This message will not appear for another 3 months' check box
   a. Click **OK**

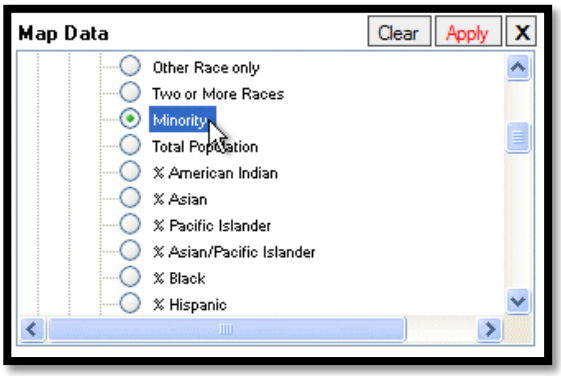
The software displays the Map Data pane.



4. Use the tree view to select the data you want to display on the map, for this example select the GeoDemographic Data folder
5. Then select the **Population** folder.
6. Scroll down the list and select **Minority**
7. Click **Apply**
   a. The software displays the Map Settings pane



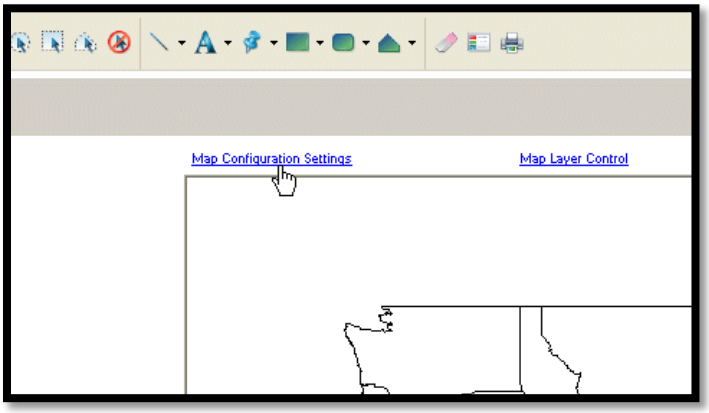
8. Click **Apply** located at the top-right of the Map Settings pane
   a. Dot density is added to the map
   b. Calculated "Per Dot" value is added to the legend. For example, 1 Dot = 374.4



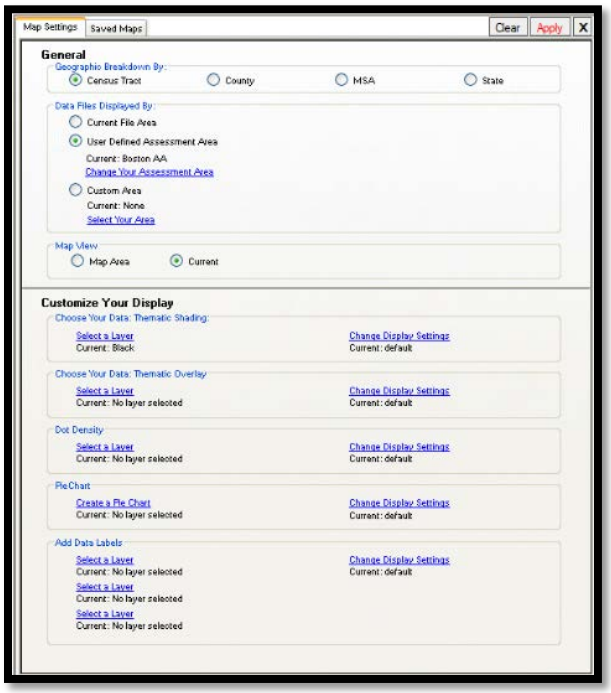
Adding Pie Charts

To add pie charts to a map, follow these steps:

1. Clear Dot Density settings
2. Click the Map Configuration Settings link.



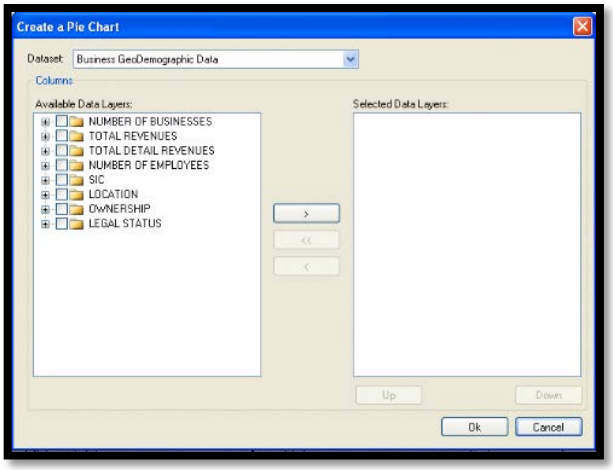
The software displays the Map Settings pane.



3. In the Customize Your **Display** pane, click the **Select a Layer** link located under the **Pie Chart** section

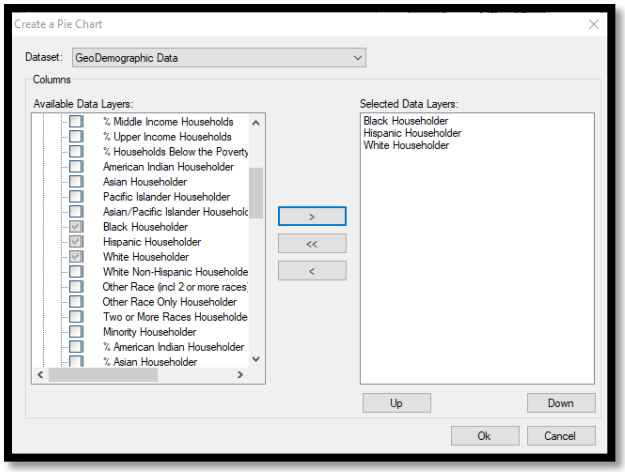
The software displays the Create a Pie Chart dialog box.

4. Use the **Dataset** drop-down menu located at the top of the dialog box to select the data set (Business GeoDemographic Data, GeoDemographic Data, Projected GeoDemographic Data, Transitional Census 2010, and Current File) you want to add to the pie charts
5. To add a variable, select the checkbox for the variable and then click the right-facing arrow button
   a. The variable will be displayed in the right-hand list box
   b. To remove a variable, click the left-facing arrow button
   c. To remove all selected variables, click the double-left-facing arrow button

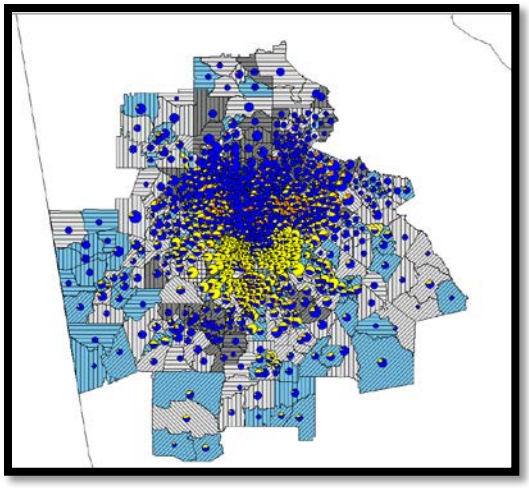


You must select a minimum of **two** (2) variables to create a pie chart. A maximum of **six** (6) variables can be selected.

6. Select a layer variable and then click the Up or Down buttons to move the variable up or down the list. For this training select Households and then Black Householder, Hispanic Householder and White Householder
7. When you have finished adding variables, click **OK**
   a. The software displays the Map Settings pane
8. Click the **Apply** link located at the top-right of the Map Settings pane



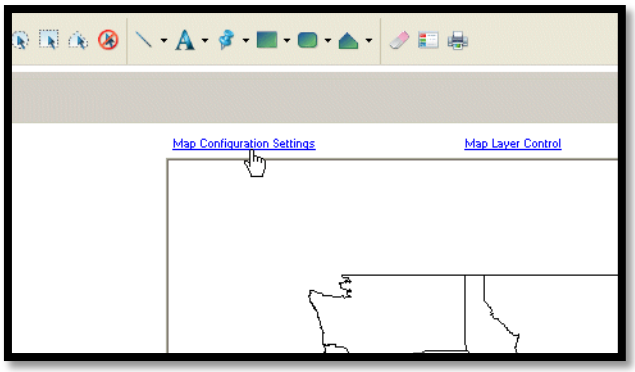
9. The following items are added to the map:
   a. Pie charts
   b. Associated pie chart descriptions to the legend



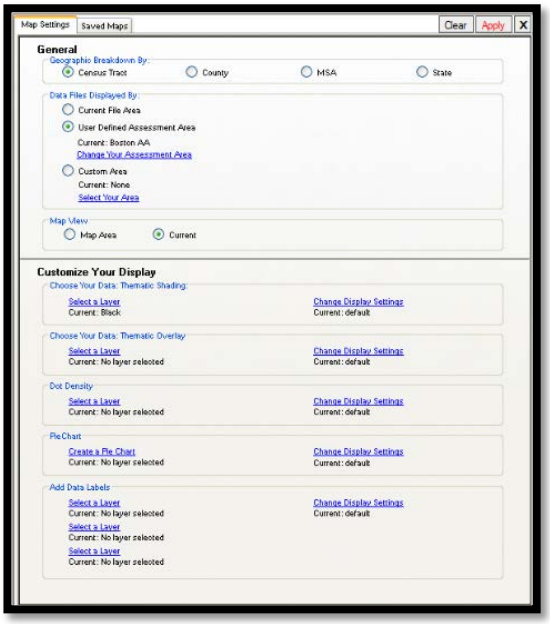
Adding Data Labels

To add data labels to a map, follow these steps:

1. Clear the **Pie Charts**
2. Click the **Map Configuration Settings** link



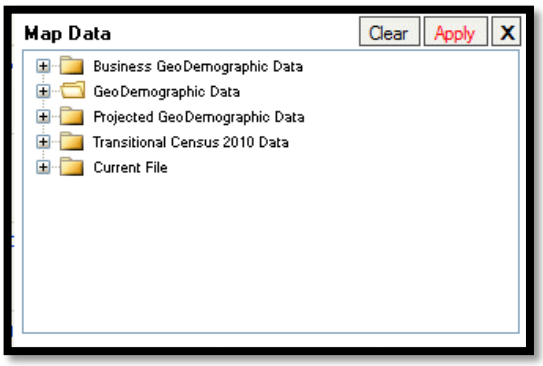
The software displays the **Map Settings** pane.



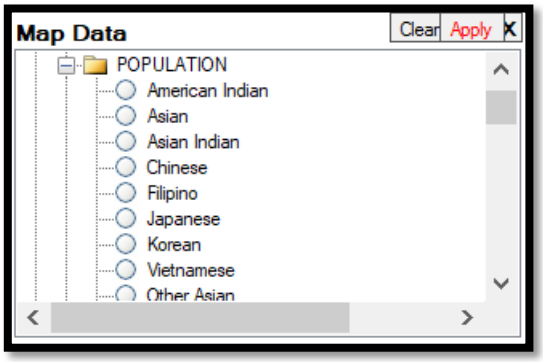
3. In the **Customize Your Display** pane, click the **Select a Layer** link located under the **Add Data Labels** section.

You can configure the other two (2) **Select a Layer** links to display a total of three (3) data labels on the map.

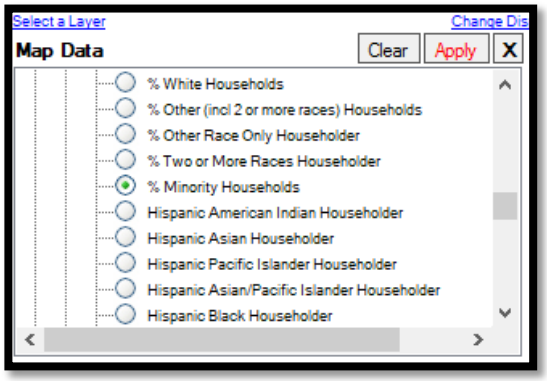
The software displays the **Map Data** pane.



4. Use the tree view to select the data you want to display on the map. Select the **GeoDemographic Data** folder, select **Population** and select **% Minority Households**



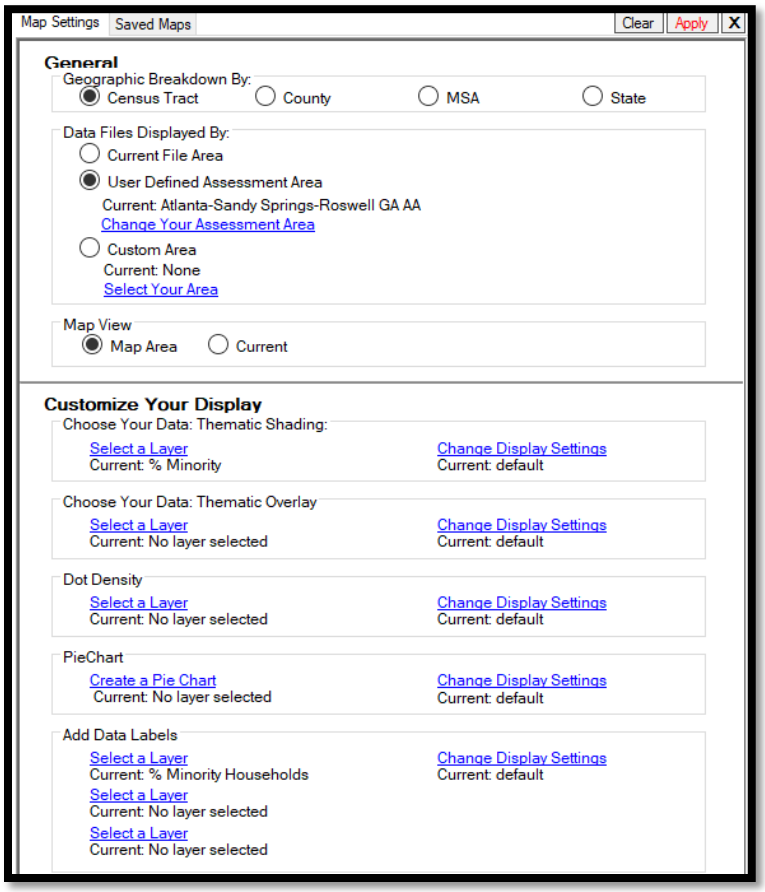
5. Click **Apply**



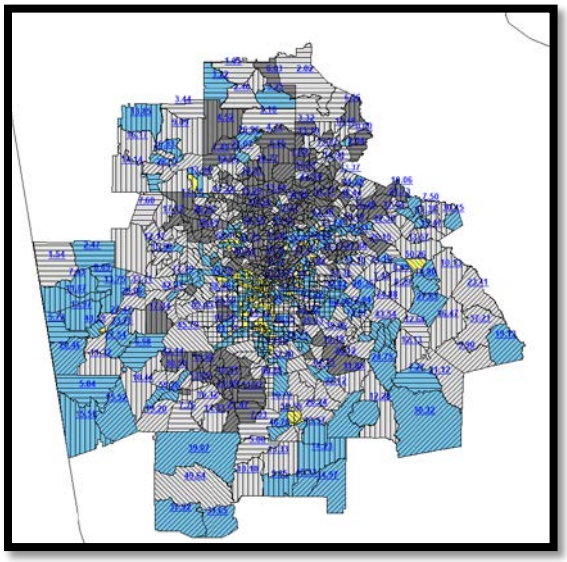
The software displays the Map Settings pane.

Up to three (3) total labels can be added.

6. Click the **Apply** link located at the top-right of the **Map Settings** pane



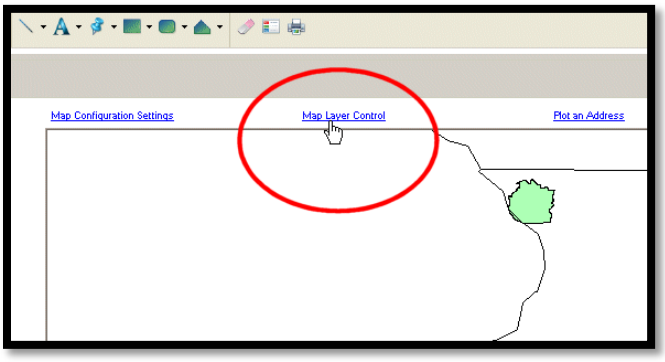
7. Labels are added to the map



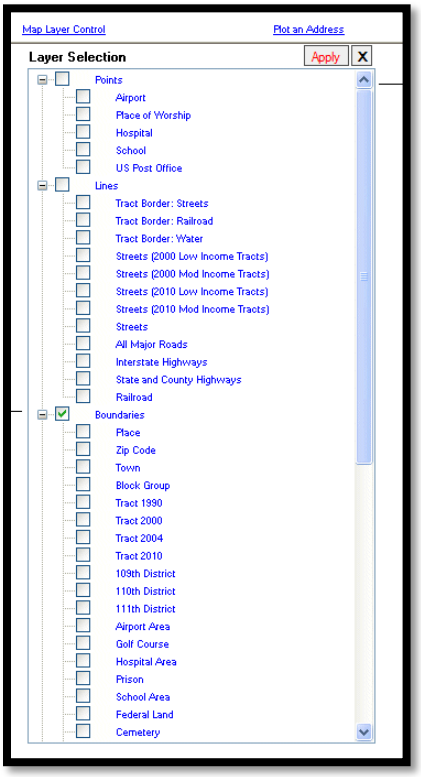
Adding Map Layers

To add layers (features) to a map, follow these steps:

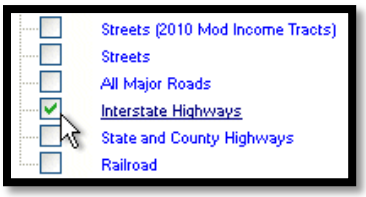
1. Clear all labels
2. Click the **Map Layer Control** link



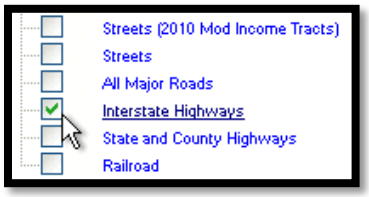
The software displays the **Layer Selection** pane.



3. To turn a layer on, select the checkbox for a layer, for example, **Interstate Highways**

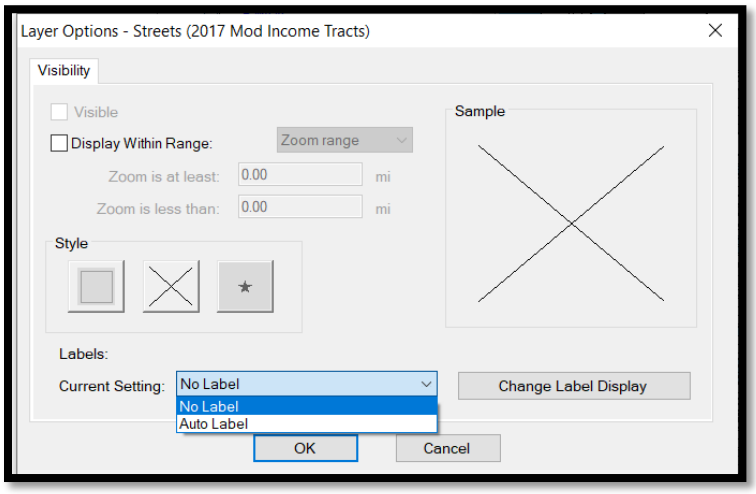


4. To configure display options for the **layer**, click the name for the item



5. The **Layer Options - [Name of Layer]** dialog box opens

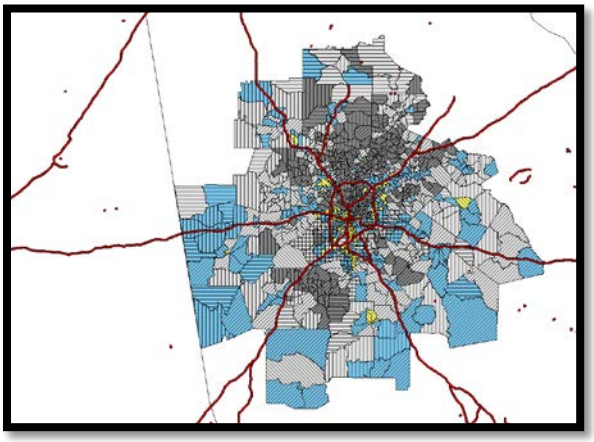
6. Under current setting, select Auto Label
7. Click **OK**



The software displays the Layer Selection pane.

8. Click **Apply** located at the top-right corner of the Layer Selection

9. The following items are added to the map:
   a. Layers (features)
   b. New layers to the legend

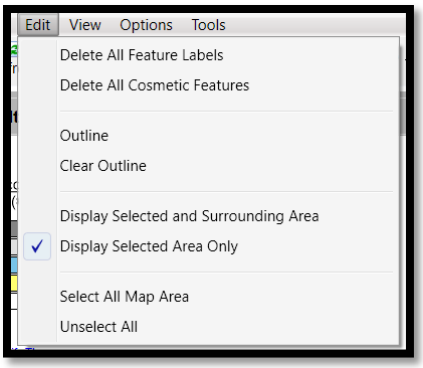


Applying Labels to Map Layers

Using the Layer Options dialog box, you can add labels to the three map layer types (geographic boundaries, lines, and points).

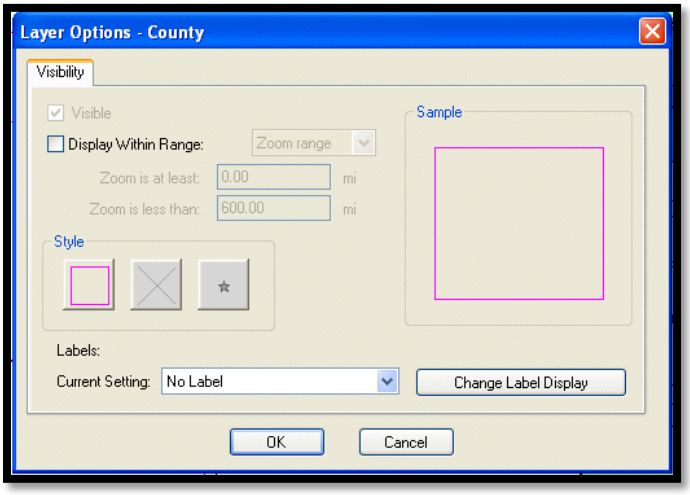
To add labels to a layer, follow these steps:

1. **Add Map Layer Control of Water**
   - Select **Edit** and select Display Selected Area Only

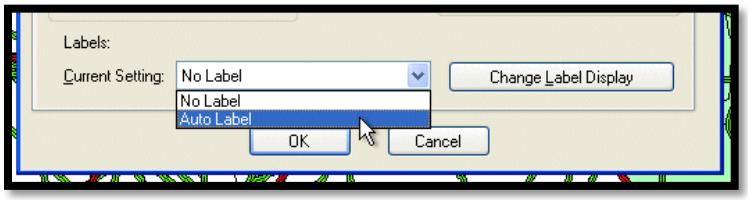


2. Below the map theme legend on the left side of the map, double-click on a currently displayed layer

The software displays the Layer Options **- [Name of Layer]** dialog box.



3. From the **Current Setting** drop-down menu located in the **Labels** section of the dialog box, select **Auto Label**
4. To change label display options, click the **Change Label Display** button



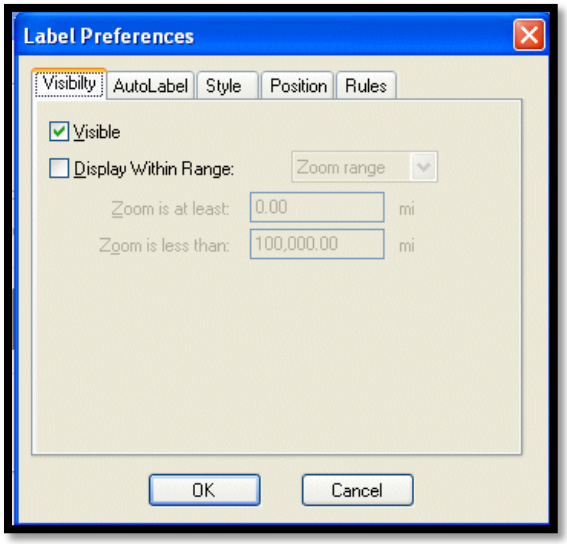
The software displays the **Label Preferences** dialog box.

Use the provided options in the five tabs (**Visibility, AutoLabel, Style, Position**, and **Rules**) to customize label settings such as font, color, and position.

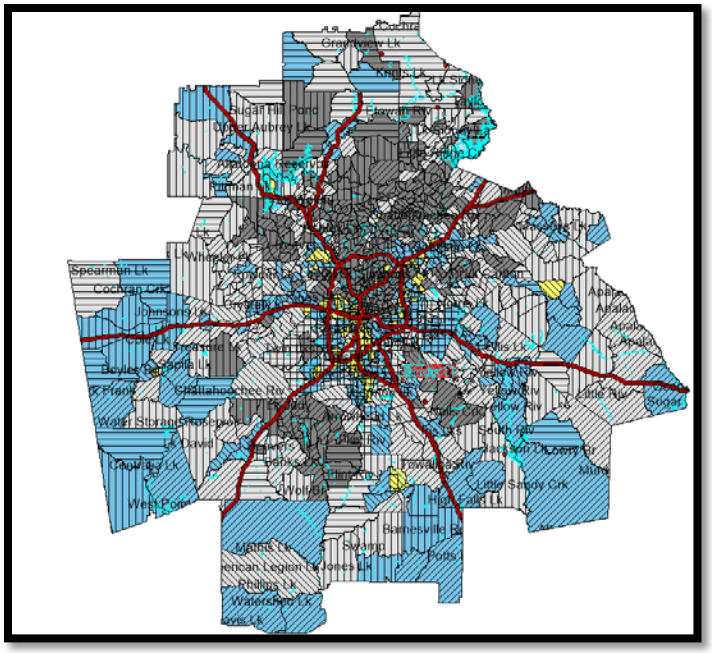
5. When you have configured label options, click **OK**

The software displays the Layer Options dialog box.

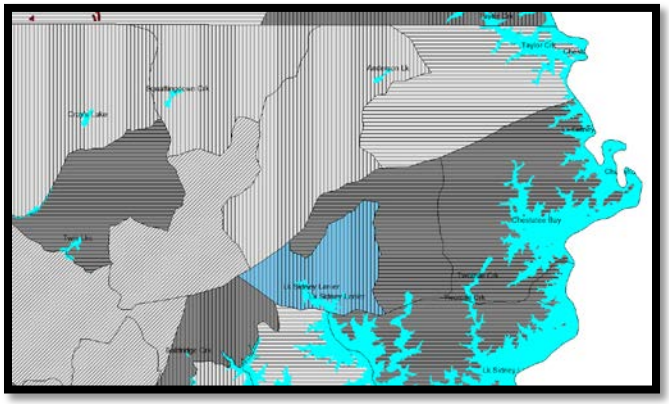
6. Click **OK** in the **Layer Options** dialog box



The software displays label names on the map.



7. Zoom in on an area of the map to get a better view



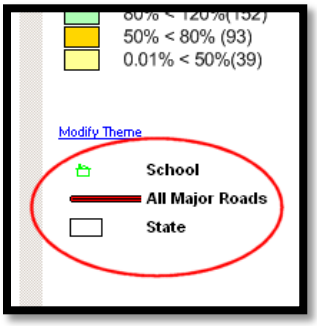
Modifying Layer Display

Using the Layer Options dialog box, you can modify the display options for the following map layer types:

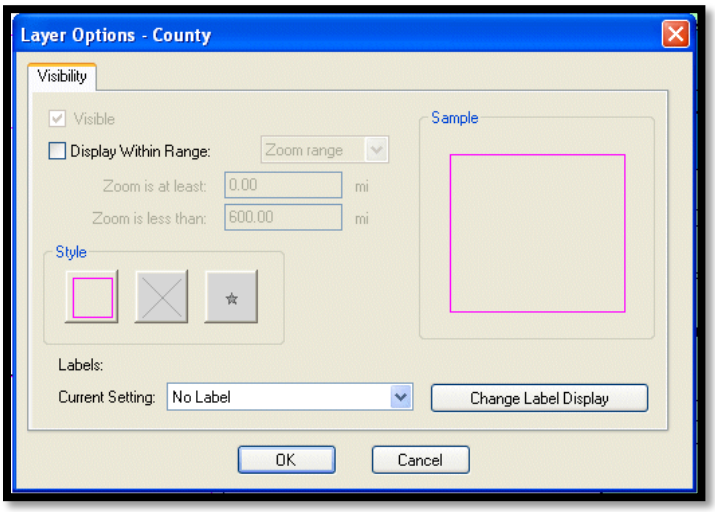
- **Geographic Boundaries** - Modify the style (fill type, color, transparency level, width, etc.) of borders for geographic boundaries such as States or Counties
- **Points** - Modify the display symbols and style used for points such as schools and hospitals
- **Lines** - Modify the style used for lines such as streets, highways, and railroads

To modify layer display:

1. Adjust the Map Layer Control and remove water and add School Area from Boundaries
2. Below the map theme legend on the left side of the map, double-click on a currently displayed layer



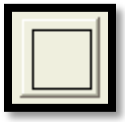
The software displays the **Layer Options** - [Name of Layer] dialog box.



3. To change the display properties of a layer, click one of the three buttons located in the Style section of the Layer Options dialog box

The type of the layer you selected in **Step 1** determines which of the three buttons is enabled in the dialog box.

4. Click to modify the style for a geographic area



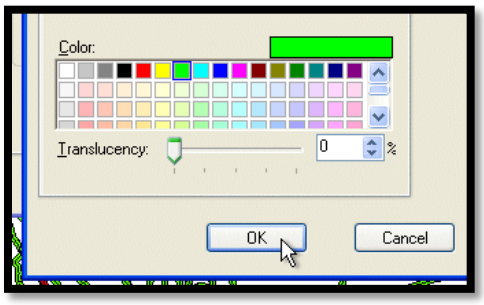
5. Click to modify the style for a line

6. Click to modify the style for a point

The software displays one of the following **Style** dialog boxes:

- Area Style dialog box - Use the options provided in the two tabs (Fill and Border) of this dialog box to change the style and color of the fill for a geographical boundary layer, as well as the style, width, and color of the area's borders
- Line Style dialog box - Use the provided options to change the style, color, and width of a line layer such as a street or railroad
- Symbol Style dialog box - Use the provided options to change the font family used to display a symbol, along with the symbol type and color

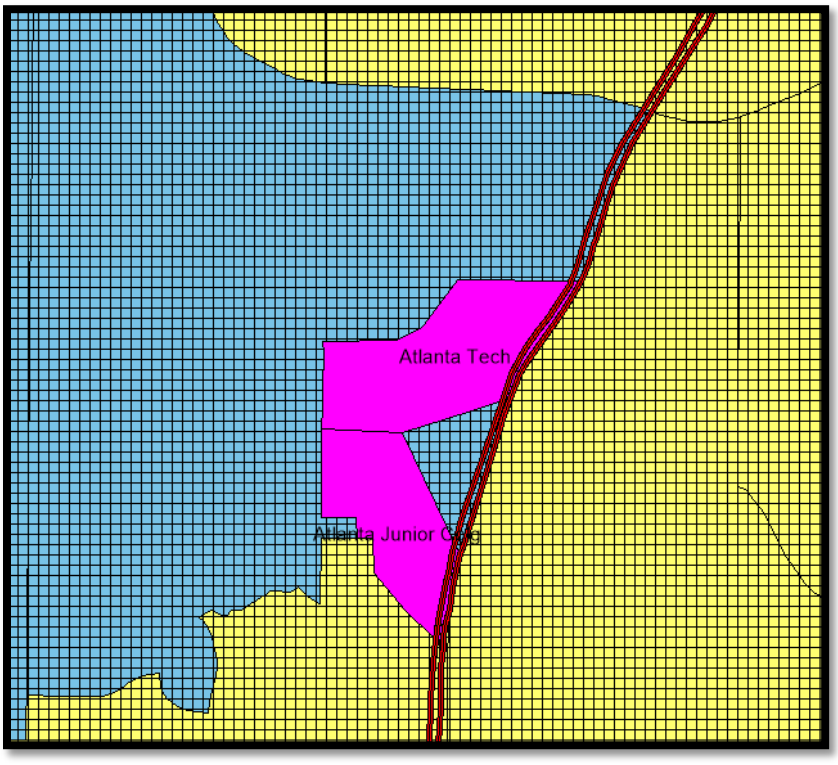
7. When you have configured the necessary **layer** options in a dialog box, click **OK.**



The software displays the Layer Options dialog box.

8. Click **OK**

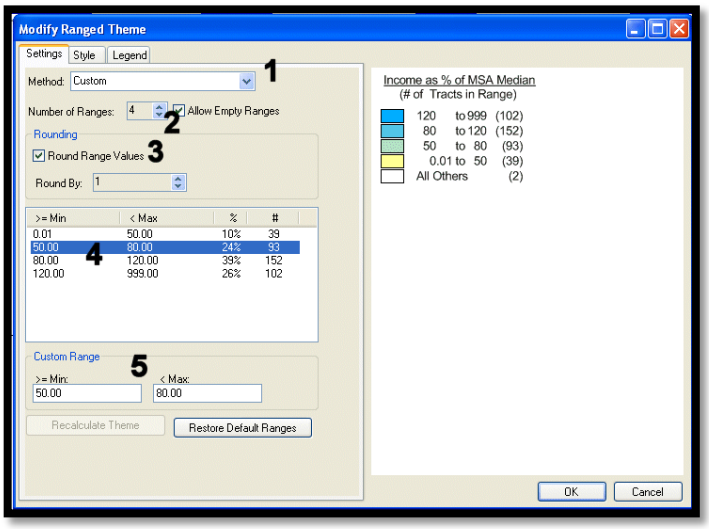
The software applies your changes to the layer. In this example, the user selected purple color and auto label.



Modifying Existing Themes

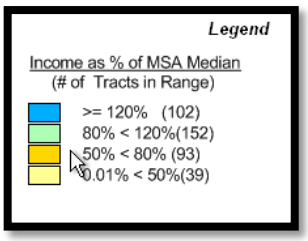
You can modify an existing theme by changing map legend display options such as:

1. Range colors used
2. Calculation method
3. Rounding
4. Number of ranges
5. Labels



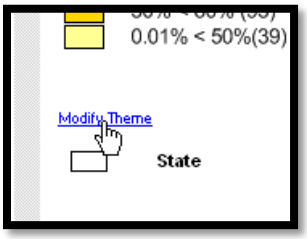
To modify an existing theme:

1. Double-click the map legend



OR —

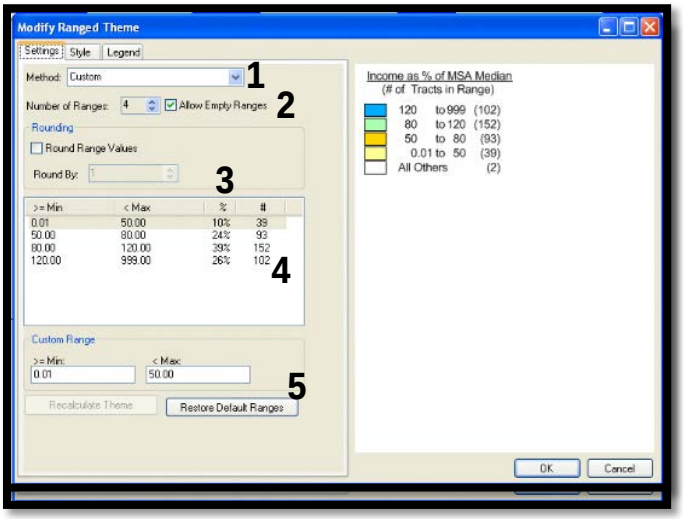
2. Click the Modify Theme link located beneath the map legend



The software displays the Modify Ranged Theme dialog box.

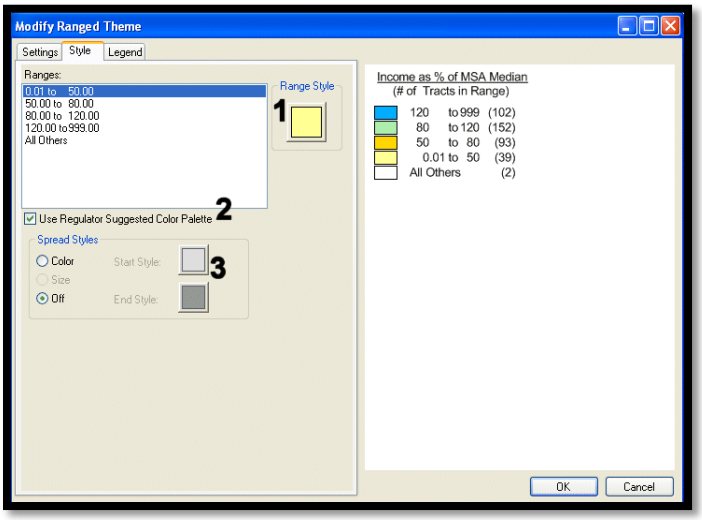
The dialog box is divided into three tabs. Each tab displays legend options on the left, and a live preview of your changes to the map legend on the right.

Settings tab



1. Select a range breakdown (Equal Count, Equal Ranges, Natural Break, Standard Deviation, and Custom) (1)
2. Select the number of ranges displayed in the legend (2)
3. Enable rounding for range values (3)
4. Create custom ranges by selecting a range in the list box (4)
5. Enter a new minimum (> = **Min**) and maximum (< **Max**) range in the provided text fields (5) and Recalculate Theme

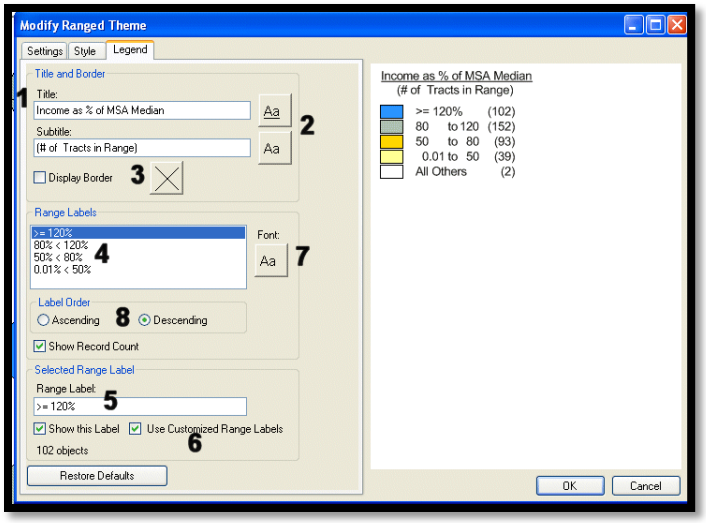
Style tab



1. Click the **Range** Style button for a selected range to modify the display style for a selected range, including fill color, transparency, border style and border thickness (1)
2. The **Use Regulator Suggested Color Palette** checkbox/option is enabled by default for demographics with four ranges (2)
3. To override this option, de-select the checkbox then use the **Start Style and End Style** buttons in the **Spread Styles** section to configure customized color spreads for a data range (3)

Legend tab

1. Modify the legend **title** and **subtitle** (1)
2. Click the font buttons located next to each legend title to change display font options (2)
3. Click the legend display border button to add a border around the legend. This option is disabled by default. To enable, select the **Display Border** checkbox) (3)
4. Modify range labels in the legend by selecting a range in the **Range Labels** list box (4)
5. Modify the selected label in the **Selected Range Label** text field (5)
6. To modify the range labels, select the Use **Customized Range Labels** checkbox (6)



7. Click the range labels **Font** button to change range label font options. (7)
8. You can change the range label display order by selecting the **Ascending** or **Descending** option buttons (8)
9. Modify legend options as necessary in the tabs
   - Click **OK**
10. The software updates the legend and/or map theme

Mapping Your Lending Activity

Users frequently utilize GeoDemographic or Business Demographic data, to apply themes to their map. The Income as a % MSA Median variable available in GeoDemographic Data is a commonly used variable when applying thematic shading to a map. % Minority is used specifically for redlining work.

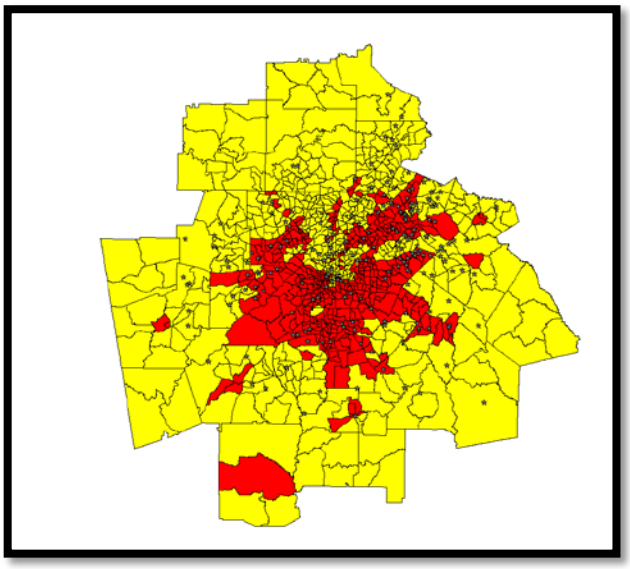
In addition to using demographic data sets to create thematic maps, the Mapper allows users to plot lending activity based on their institution's data files.

To create this map, complete the following steps:

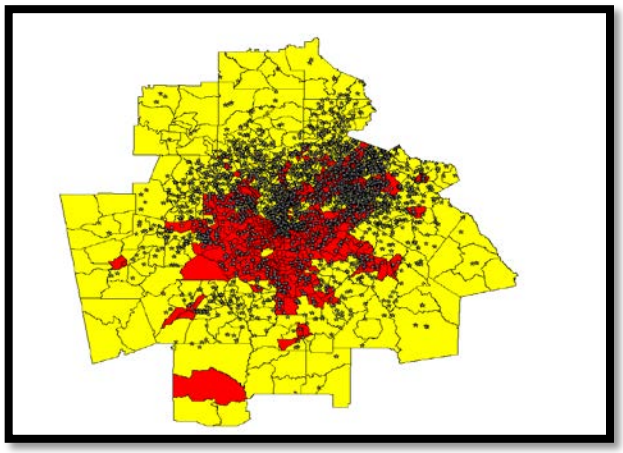
Prior to creating to your map, ensure that your Current File in the Mapper is set and contains the necessary fields for mapping, such as latitude and longitude.

Start a New Map

1. Click the **Map Configuration Settings** link
2. Keep census tract and the same assessment area
3. In the **Customize Your Display** section, select the **Select a Layer** link available for **Thematic Shading**
4. Click on the **GeoDemographic** folder to expand its contents, select **Population** and select **% Minority**
   a. Click **Apply**
   b. Change the display settings for 2 ranges
5. Go to Legend and **modify Theme**. Adjust the ranges as follows: 0-49.99% and 50%-100% and recalculate theme
6. Under **Style**, change the 0-49.99% range to yellow and the 50%+ to red. Under **Legend**, change the **Range Labels** to <50% and >=50%.
   a. Click **OK**
7. Go to **Map Layer** Control
8. Add **Current File as Custom Coordinates**. If needed, display **Selected Map Area Only**
9. The map shows all application activity with stars

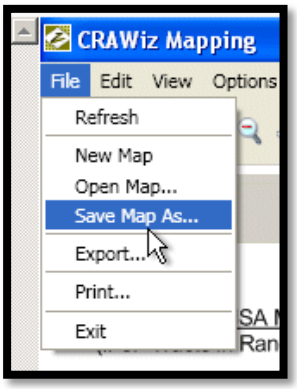


10. Go to *Wiz* and the **Edit Screen** and apply a filter for **denials**
11. Go back to the Map and click **Refresh**. You may need to reapply the current file. The map now tells a different story. Most of the declines appear to be in minority areas



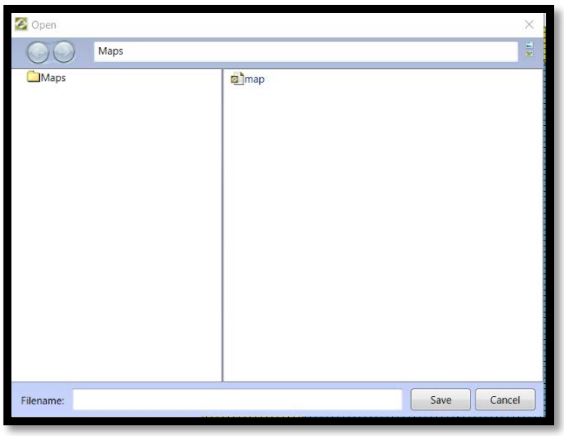
Saving the Map

Maps can be saved, exported, or printed.



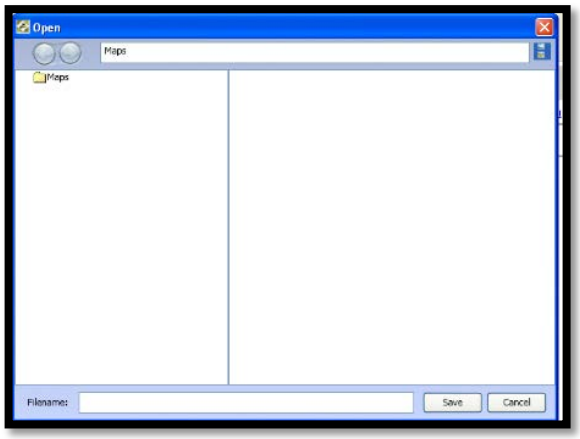
To save a map:

1. From the File menu, select **Save Map As…**
2. The system will display the **Maps** location.
3. Enter a **filename** and click **Save**



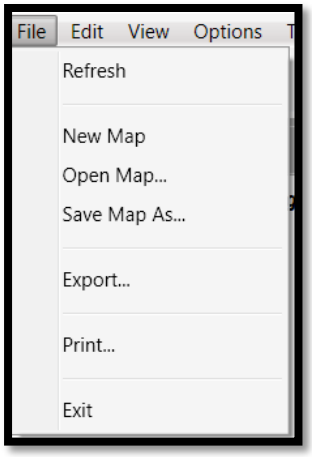
OR-

1. At the bottom-left of the map screen, click the Save icon
2. The software displays a dialog box
3. In the Filename text field located at the bottom of the dialog box, enter a name for the map
   a. Click **Save**
4. The software saves your map within the CRA *Wiz* system

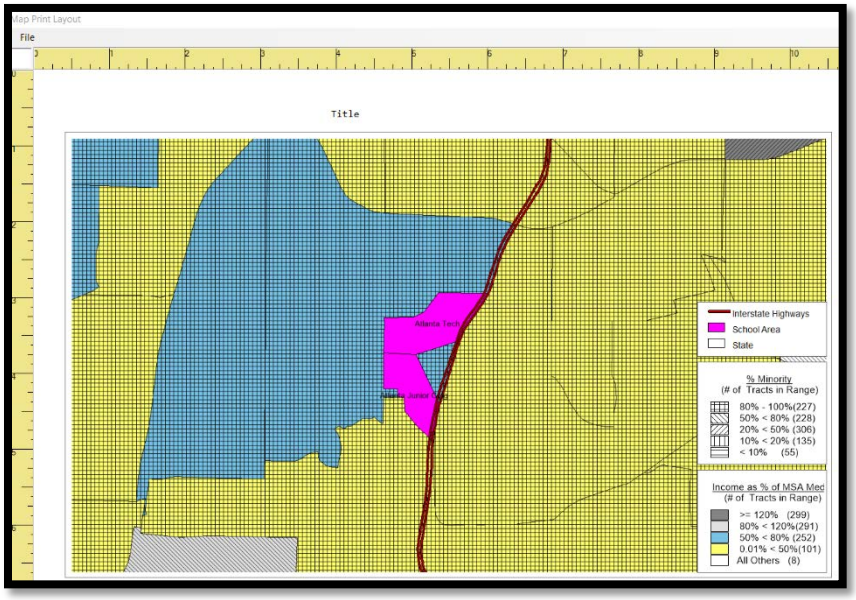


To Print the Map

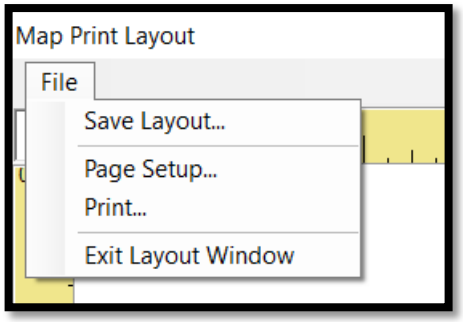
1. From the File menu, select **Print**



2. The system will display the **Map Print Layout** screen
3. Click on "**Title**" and type "Assessment Area Map"

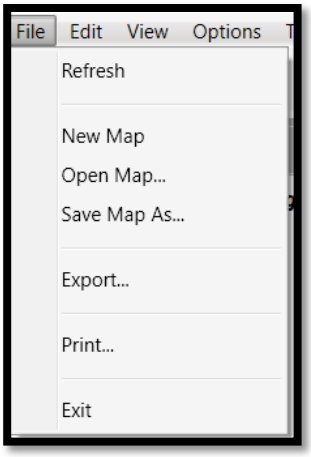


4. Click "**File**" and print the map

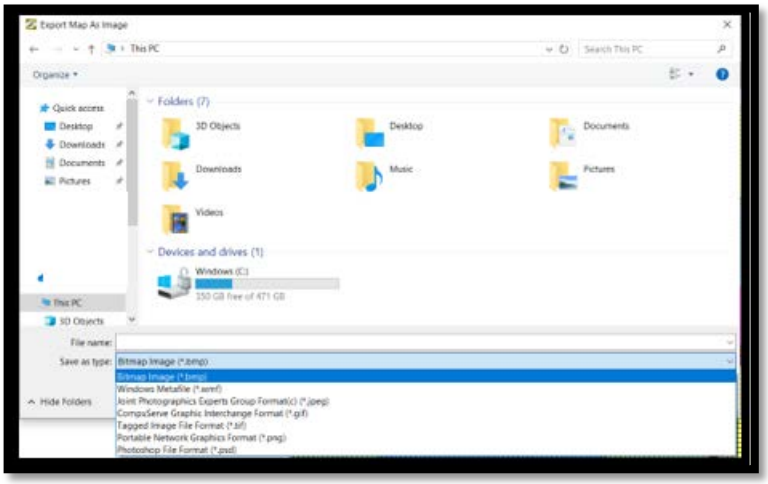


To Export the Map

1. From the File menu, select **Export**



2. The system will display the "Export Map As Image" dialog box.
3. Select the location to export to
4. Enter a file name
5. Select a file type in the **Save as Type** drop down
6. Click **Save.** The map will be exported to the location selected



About Wolters Kluwer Governance, Risk & Compliance

Governance, Risk & Compliance (GRC) is a division of Wolters Kluwer, which provides legal and banking professionals with solutions to ensure compliance with ever-changing regulatory and legal obligations, manage risk, increase efficiency, and produce better business outcomes. GRC offers a portfolio of technology-enabled expert services and solutions focused on legal entity compliance, legal operations management, banking product compliance, and banking regulatory compliance.

Wolters Kluwer (AEX: WKL) is a global leader in information services and solutions for professionals in the health, tax and accounting, risk and compliance, finance and legal sectors. Wolters Kluwer reported 2019 annual revenues of €4.6 billion. The company, headquartered in Alphen aan den Rijn, the Netherlands, serves customers in over 180 countries, maintains operations in over 40 countries and employs 19,000 people worldwide.