

Insight

User manual

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0. Installing Insight

In this section we will cover:

- How to install Insight
- How to run Insight

Prerequisites:

- Insight requires Java 14.0.2 or later to run. A guide on how to install this can be found here:



https://java.com/en/download/help/download_options.html

- Insight requires that the Files folder be located in the same directory as the Insight.jar file. Your directory should look like this:



Files



Insight.jar

Windows:

- Insight can be run by double clicking on Insight.jar

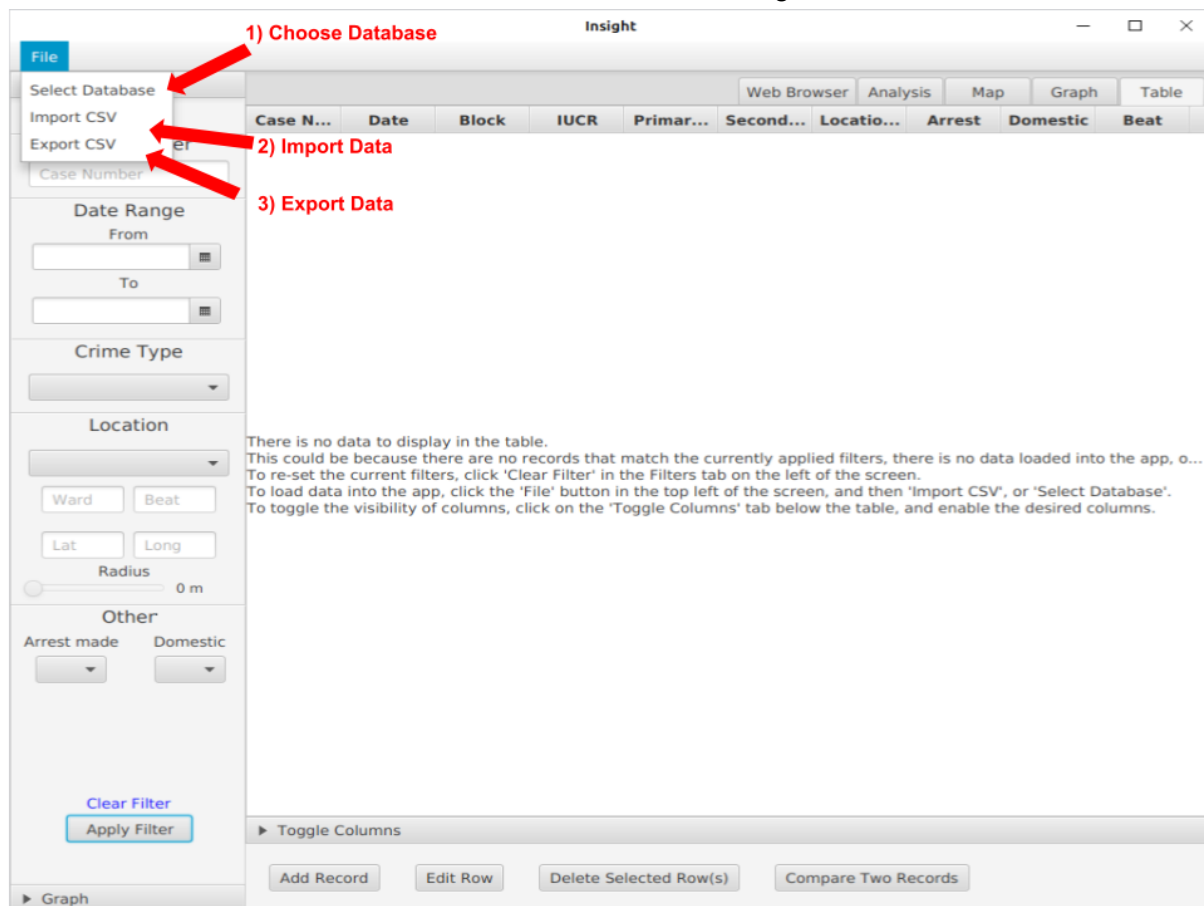
All Operating Systems:

- Insight must be run through command line/terminal
 - Open a new command line/terminal window
 - Navigate to the directory containing Insight.jar and the Files folder
 - Run the following command: `java -jar seng202_2021_team10_phase3_Insight.jar`

1. Importing and Exporting Crime Data

In this section, we will cover:

- How to import a .CSV file of crime data into Insight
- How to export the table to a .CSV file
- How to select a .DB database of crime data with Insight



You can import your data from a CSV file by clicking on the “File” menu button and selecting “Import CSV” (number 2 in **Figure 1**). Then, you must select the .csv file you want to import and click the “Open” button at the bottom right corner of the file chooser.

A pop up will ask if you want to store the data in a new database or an existing database. If you choose the “New Database” option, the program stores the imported data in a new database file. The program will open a file chooser where you must choose the name and location of the new database. After that, click the “Save” button at the bottom right corner of the file chooser. If you choose “Existing Database” the program will save the imported data to the currently opened database. You can choose “Replace” which will replace the data stored in the database with the imported data. You can choose “Append” which will append the imported data to the data stored in the database.

The data will then be imported from the CSV file and the program will give you a pop up which displays the number of rows which could not be imported because their format was invalid. **Table 1** shows the constraints for a valid crime record.

You can export your data to a CSV file by clicking on the “File” menu button and selecting “Export CSV” (number 2 in **Figure 1**). The program will prompt you to enter the name and location of the CSV file you want to export your data to. The program will then write the records in the Table tab (including any filters you have applied) to a CSV file.

You can choose a database by clicking on the “File” menu button and selecting “Select Database” (number 1 in **Figure 1**). A file chooser will pop up where you can select a database to open with the program. If an invalid database file is chosen, the program will revert to the previous database before the invalid one was selected.

2. Viewing Crime Data in the Table

In this section, we will cover:

- How to sort crime records in the table
- How to toggle the display of table columns
- How to the details of each individual crime record separately

1) Column headers

2) Table tab button

3) Toggle columns according

Case Number	Date	Block	IUCR	Primary De...	Secondary ...	Location D...	Arrest	Domestic	Beat
JE266628	06/15/2021...	080XX S DR...	0820	THEFT	\$500 AND ...	STREET	N	N	631
JE266536	06/15/2021...	042XX W M...	0560	ASSAULT	SIMPLE	SIDEWALK	N	N	1115
JE266959	06/15/2021...	018XX N D...	0460	BATTERY	SIMPLE	PARK PROP...	N	N	1434
JE267466	06/15/2021...	007XX S KE...	051B	ASSAULT	AGGRAVAT...	SIDEWALK	Y	N	1134
JE266473	06/15/2021...	062XX S M...	0110	HOMICIDE	FIRST DEGR...	APARTMENT	N	N	712
JE267222	06/15/2021...	015XX S KE...	4386	OTHER OFF...	VIOLATION ...	APARTMENT	N	Y	1012
JE266604	06/15/2021...	013XX W A...	0430	BATTERY	AGGRAVAT...	STREET	N	N	1215
JE266568	06/15/2021...	055XX N M...	0810	THEFT	OVER \$500	STREET	N	N	1622
JE267023	06/15/2021...	082XX S ST...	0460	BATTERY	SIMPLE	STREET	N	N	411
JE267234	06/15/2021...	107XX S GR...	0486	BATTERY	DOMESTIC ...	RESIDENCE	N	Y	2233
JE267494	06/15/2021...	052XX S AR...	0110	HOMICIDE	FIRST DEGR...	STREET	N	N	923
JE267500	06/15/2021...	040XX W 1...	1320	CRIMINAL ...	TO VEHICLE	APARTMENT	N	N	2211
JE266437	06/15/2021...	078XX S AD...	141A	WEAPONS ...	UNLAWFUL...	APARTMENT	N	N	612
JE266989	06/15/2021...	051XX N LI...	1330	CRIMINAL T...	TO LAND	DRUG STORE	N	N	2031
JE267088	06/15/2021...	030XX N CL...	0860	THEFT	RETAIL THEFT	DEPARTME...	N	N	1934
JE267319	06/15/2021...	045XX W A...	1154	DECEPTIVE ...	FINANCIAL ...	RESIDENCE	N	N	2521
JE267295	06/15/2021...	002XX N M...	0486	BATTERY	DOMESTIC ...	APARTMENT	N	Y	1512
JE267345	06/15/2021...	042XX N EL...	0810	THEFT	OVER \$500	STREET	N	N	1723
JE266996	06/15/2021...	010XX W R...	1310	CRIMINAL ...	TO PROPER...	APARTMENT	N	N	1232
JE267206	06/15/2021...	048XX N PU...	0460	BATTERY	SIMPLE	PARKING L...	N	N	1712
JE266968	06/15/2021...	004XX E 88...	0820	THEFT	\$500 AND ...	ALLEY	N	N	632
JE267218	06/15/2021...	045XX N K...	0486	BATTERY	DOMESTIC ...	APARTMENT	N	Y	1722
JE266443	06/15/2021...	050XX W A...	1020	ARSON	BY FIRE	STREET	N	N	1634
JE267430	06/15/2021...	038XX S PA...	2820	OTHER OFF...	TELEPHONE...	APARTMENT	N	N	915
JE266416	06/15/2021...	115XX S YA...	4387	OTHER OFF...	VIOLATE O...	RESIDENCE ...	N	Y	522
JE266853	06/15/2021...	077XX S YA...	0560	ASSAULT	SIMPLE	APARTMENT	N	Y	421

Figure 2 - Table tab overview.

Any data that has been imported will automatically be displayed in a table. Access the table by clicking on the “Table” tab at the top right of the window (number 2 in **Figure 2**).

To resize a particular column, hover the mouse over the line between two columns, then click and drag to resize.

To sort the crime records by a particular column, click on that column’s header (number 1 in **Figure 2**). This will toggle between ascending order, descending order, or an unsorted order. Sorting can take some time on longer datasets, however.

Case Number	Date	Block
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Figure 3 - Column sorting example. The records will be sorted by Case Number (ascending), then Date (descending), and finally Block (ascending).

To prioritise columns to sort by, hold SHIFT while clicking on the column headers. The dots in each column indicate the priority of that column. In **Figure 3**, the crime records will be sorted by their Case Number (ascending), then their Date (descending), and then their Block (ascending).

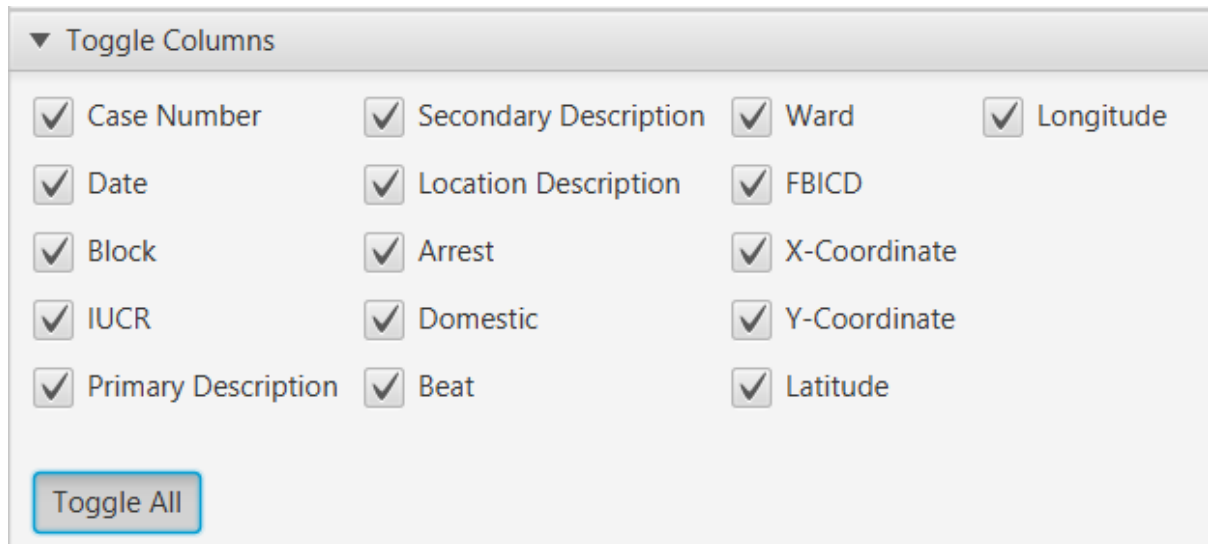


Figure 4 - Toggle columns pane. Clicking on each box will toggle that column's visibility in the table.

Each column can also be toggled on and off, so that only the important information about each record is shown. To toggle columns, click on the "Toggle Columns" tab below the table (number 3 in **Figure 2**). From there, click on each box to toggle that column on or off, as in **Figure 4**. The "Toggle All" button will turn all columns on or off.

Each crime record can be viewed in more detail by double clicking its row in the table, right clicking its row in the table and then clicking "Edit", or by selecting the record and then clicking the "Edit Row" button below the table. Select a record by clicking its row in the table. Selected records are highlighted in blue. This will display all of the details of the record in a pop-up window, along with a map of its location. We will cover editing a record in the next section.

3. Creating, Editing, and Deleting Crime Data

In this section, we will cover:

- How to create your own crime records
- How to edit existing crime records
- How to delete existing crime records

To create your own crime records, click on the “Add Record” button at the bottom of the screen. Then, fill in all of the fields to create your record. Each field has some constraints that apply to its contents, listed below:

Field	Constraint
Case number.	Required. Unique in the current dataset. Consists of two letters and six numbers, e.g. “FH458261”.
Date.	Required. Follows the format mm/dd/yyyy hh:mm:ss am/pm.
Block.	Required.
IUCR.	Required. Must correspond to the given Primary Description, Secondary Description, and FBICD.
Primary Description.	Required. Must correspond to the given IUCR, Secondary Description, and FBICD.
Secondary Description.	Required. Must correspond to the given IUCR, Primary Description, and FBICD.
Location Description.	Required.
Ward.	Required. Must be a number.
Beat.	Required. Must be a number.
FBICD.	Required. Must correspond to the given IUCR, Primary Description, and Secondary Description.
X-Coordinate.	Must be a number or empty.
Y-Coordinate.	Must be a number or empty.
Latitude.	Must be a number between -90 and +90, or empty.
Longitude.	Must be a number between -180 and +180, or empty.

Table 1 - Record field constraints.

Add Record

Case Number: KF683731 * Required

Date and Time: 07/21/2020 11:30:00 AN * Required
mm/dd/yyyy hh:mm:ss am/pm

Block: 021XX N WESTBORO AVE * Required

IUCR: 0560 * Required

Primary Description: ASSAULT * Required

Secondary Description: Secondary Description * Required

Location Description: APARTMENT * Required

Ward: 24A * Required

Beat: 1183 * Required

FBICD: 08A * Required

X-Coordinate: X-Coordinate

Y-Coordinate: Y-Coordinate

Latitude: Latitude

Longitude: Longitude

☒ Arrest ☐ Domestic

Error

Invalid date and time. The correct format is mm/dd/yyyy hh:mm:ss am/pm.

OK

Add record Close

Figure 5 - Add record window. Text fields with a red outline are invalid, and an error message is provided.

Once you have filled out the necessary fields, click “Add record” to add it to the current dataset. If the record is valid, it will be saved in the current database file automatically, and will be visible in the table. If any fields are invalid, they will be highlighted in red and an error message will be shown (as in **Figure 5**).

To edit a record, you can 1) double click on the record in the table, 2) select a record in the table by clicking it and then pressing the “Edit Record” button below the table, or 3) select a record in the table by clicking it and then right click and press “Edit”. This will open up a window similar to that for adding records, except the case number cannot be edited, and the location of the crime (if available) will be displayed on a map. Each field has the same rules as when adding a record (see **Table 1**). Click the “Save record” button to save your changes.

To delete a record or records, select them in the table. This can be done by clicking one record, holding down SHIFT and clicking on two records to select all records between them, or holding down CTRL to individually select multiple records.

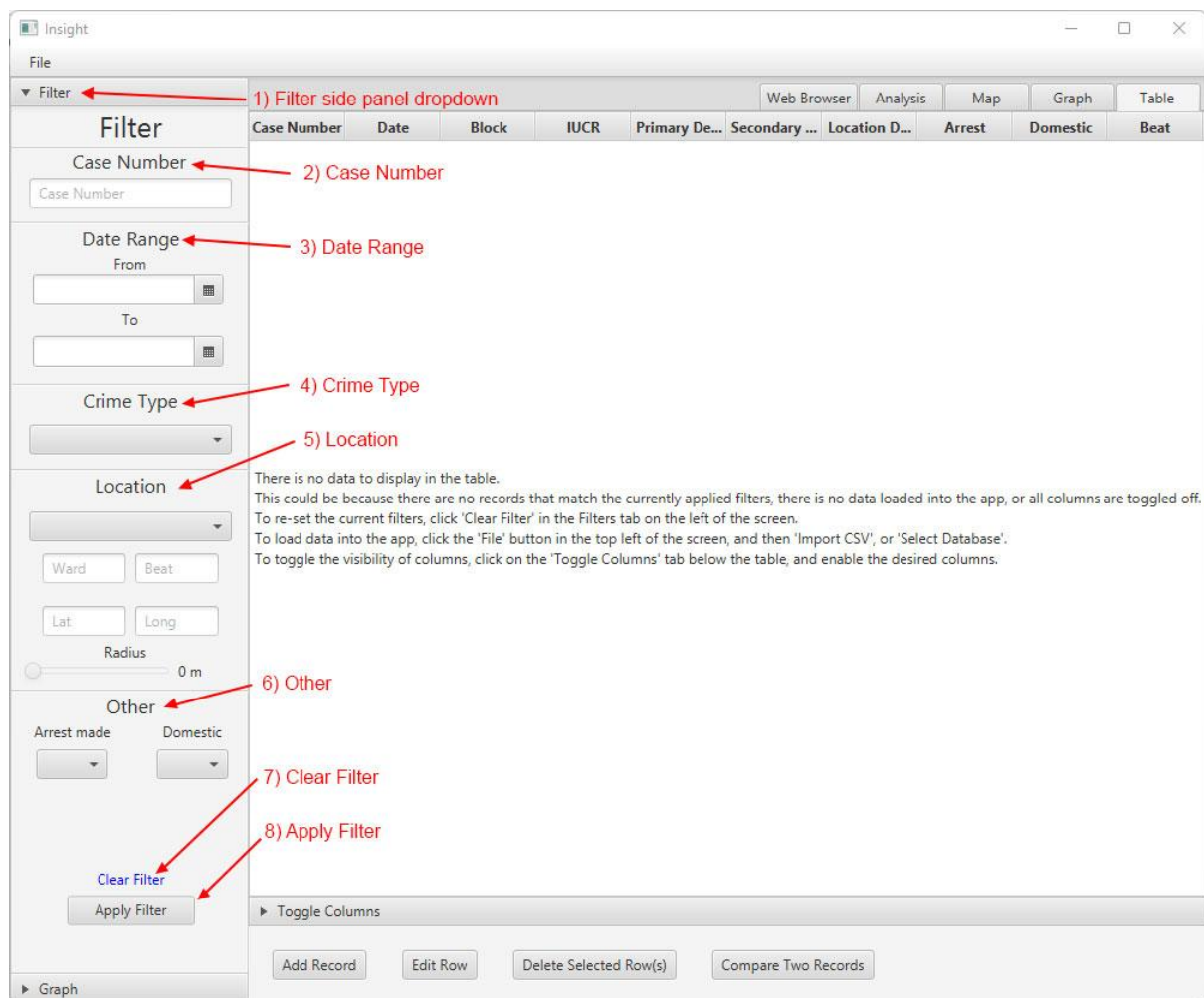
Once the records are selected, they can be deleted by either 1) pressing either the DELETE or BACKSPACE keys on the keyboard, 2) clicking the "Delete Selected Row(s)" button below the table, or 3) right clicking on the table and then clicking "Delete". A confirmation dialogue will appear, showing the number of records that will be deleted. If confirmed, the records will be deleted from the database. There is no undoing this action, so be careful!

4. Filtering Crime Data

In this section, we will cover how to filter data using the filter panel:

The filter panel will be displayed on the left-hand side of the application when it is first launched, but if closed can be reopened by clicking on the word “Filter” in the top left of the application (number 1 in **Figure 6**).

Each field in the filter panel except “Radius” corresponds to a field of the records contained in the table and can be used to display only records matching the parameters set.



Filter categories:

- Case Number
 - Records with case numbers containing text entered in this field will be displayed.
- Date Range
 - This section contains two date pickers. Any crimes occurring after the start of the first day selected and before the end of the second will be displayed.

- Crime Type
 - This section contains a dropdown from which any number of crime types can be selected. Only crimes that are one of the selected types will be displayed, unless none are selected, in which case this field will be ignored.
- Location
 - The dropdown in this section works identically as the crime types dropdown, but for location descriptions.
 - The “Ward” and “Beat” fields here correspond to the ward and beat fields of the records. Any records with a ward/beat exactly matching the number entered into these fields will be displayed. Unless the field is blank, in which case it will be ignored.
 - The “Lat” and “Long” fields relate to the Latitude and Longitude fields of the records. This value can be entered manually, but if a record is clicked, its latitude and longitude will be automatically entered. Only records within the distance set by the “Radius” slider of the given “Lat” and “Long” will be displayed. Unless the radius is set to 0 m in which case it will be ignored.
- Other
 - This section contains a dropdown for “Arrest made” and “Domestic”. These relate to the record fields “Arrest” and “Domestic”. Only records matching these dropdowns will be displayed unless they are left blank, in which case they will be ignored.
- Clear Filter
 - Clicking this button will clear all the fields in the filter and adjust which records are displayed accordingly (Note this can take a few moments with a large dataset).
- Apply Filter
 - Clicking this button will update the displayed records according to the values in each field (Note this can take a few moments with a large dataset).

5. Analysing Crime Data

In this section we will cover how to use access analysis functionality of insight:.

- The first step to access this functionality is to open the analysis tab on the main window of the application.
- As seen in the Figure 7 below, the analysis tab displays four tables each showing crime and block data analysis. The top two tables show top crime types and blocks with top crime numbers while the bottom two tables display data for lower crime types and blocks with low crime rates.

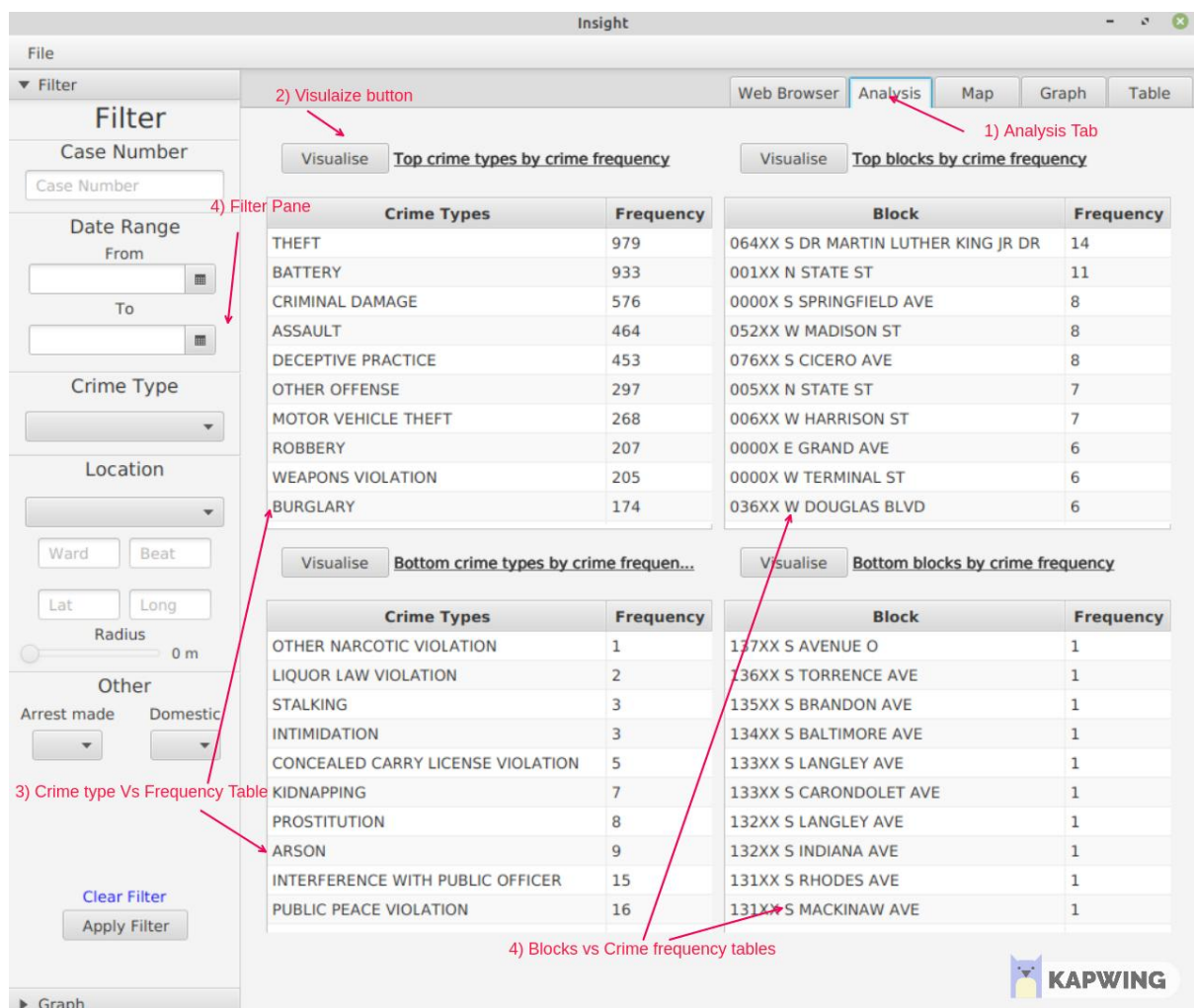


Figure 7 - Analysis Tab Overview

- You can also generate pie chart views for the data that is displayed in the tables. This is done by clicking on the visualize button (number 2 in Figure 7) that is located on top of each table.
- By right clicking on the block table row (number 4 in Figure 7) you can also view crime details for that specific block (row), or view the block in map.
- You can also apply data filtering using the filter pane (Number 4 in Figure 7) for further analysis of crimes

6. Graphing Crime Data

This section will cover how to filter data using the graph tab and graph panel:

The graph panel will be automatically selected when clicking on the graph tab (number 2 in **Figure 8**), or can be selected by clicking the word “Graph” on the left panel of the application (number 1 in **Figure 8**).

The drop down contained in the graph side panel gives four graph types to choose from, each covered in this section.

Once a graph type has been selected, clicking the “Generate Graph” button will cause it to be displayed in the graph tab.

The data displayed in the graph is affected by the filter, e.g. if the filter is set to display only robberies then only robberies will be displayed in the generated graph.

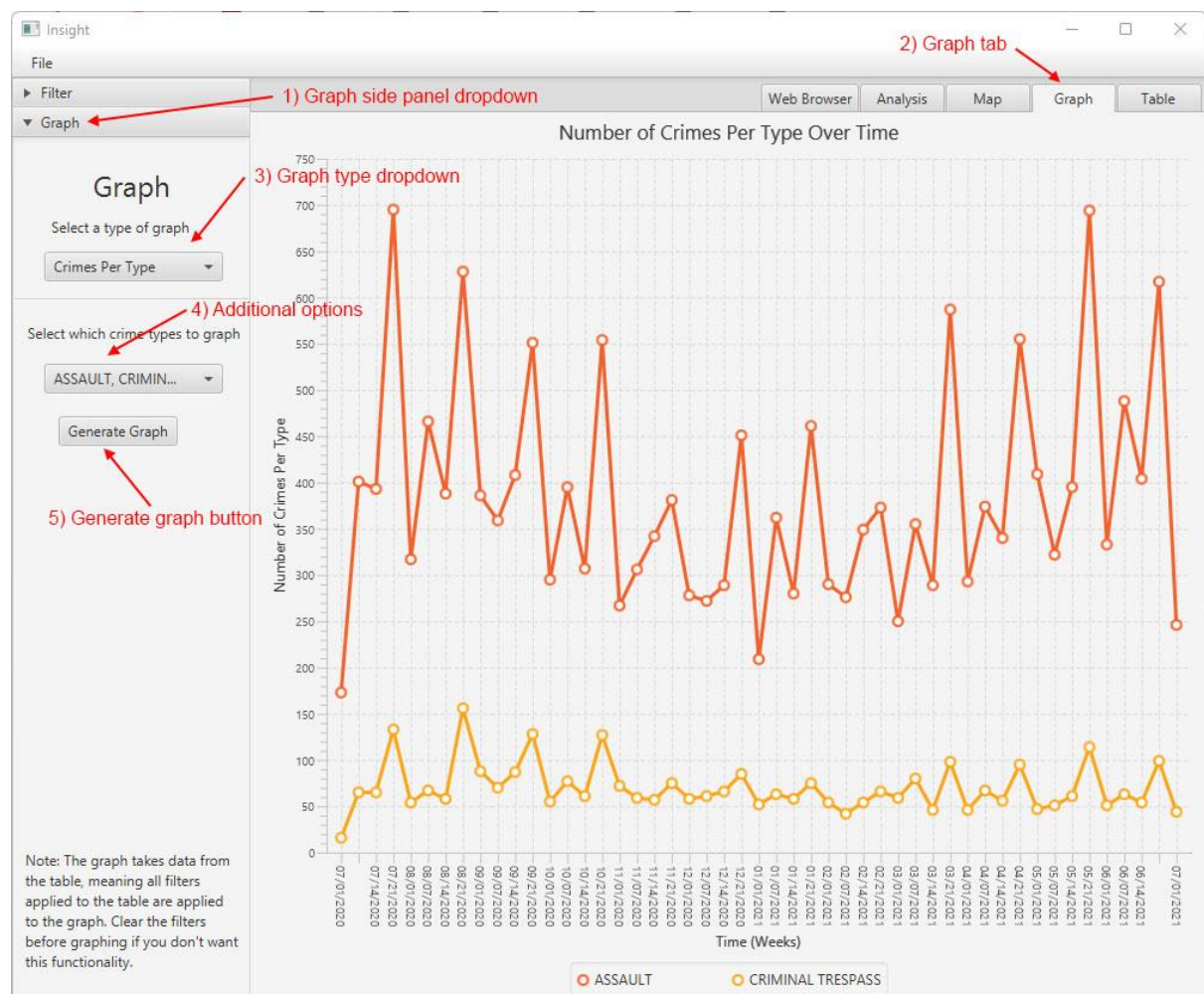


Figure 8 - Graph Tab and Sidebar Overview

Graph types:

- All Crimes
 - This graph type will graph all crimes over time.
- Crimes Per Ward
 - This type will cause a second dropdown to appear, allowing up to five wards to be selected.
 - The graph generated will graph crimes occurring in the selected wards over time separated by the ward they occurred in.
- Crimes Per Beat
 - This type will cause a second dropdown to appear, allowing up to five beats to be selected.
 - The graph generated will graph crimes occurring in the selected beats over time separated by the beat they occurred in.
- Crimes Per Type
 - This type will cause a second dropdown to appear, allowing up to five crime types to be selected.
 - The graph generated will graph crimes of the selected types separated by their type.

7. Mapping Crime Data

In this section, we will cover:

- How to visualise crime data as markers on a map
- How to visualise crime data as a heatmap

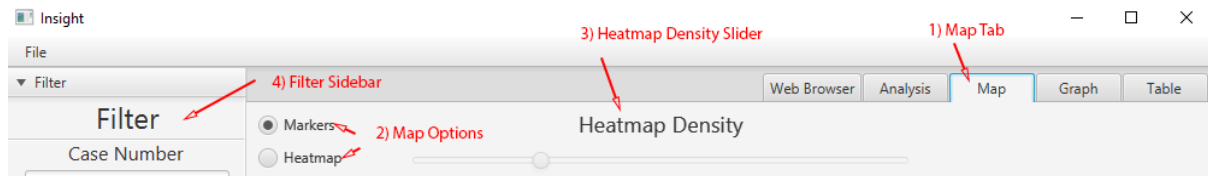


Figure 9 - Map Tab Controls Overview

You can open the map by clicking on the 'Map' tab in the main program interface.

The default map mode is to display markers, you can swap to a heatmap by clicking the heatmap option.

In both modes, the map displays the first 500 records in the table view, or all of the records if there are less than 500. You can use the filter sidebar (covered in section 4) to change the records displayed on the map, or you can use the table sorting features to prioritise which records are displayed. The map will update automatically when you clear or apply a filter, or sort the table.

In the heatmap mode, you can control the radius/density of each individual crime using the heatmap density slider. This is useful to maintain the look of the heatmap when you change the zoom on the map.

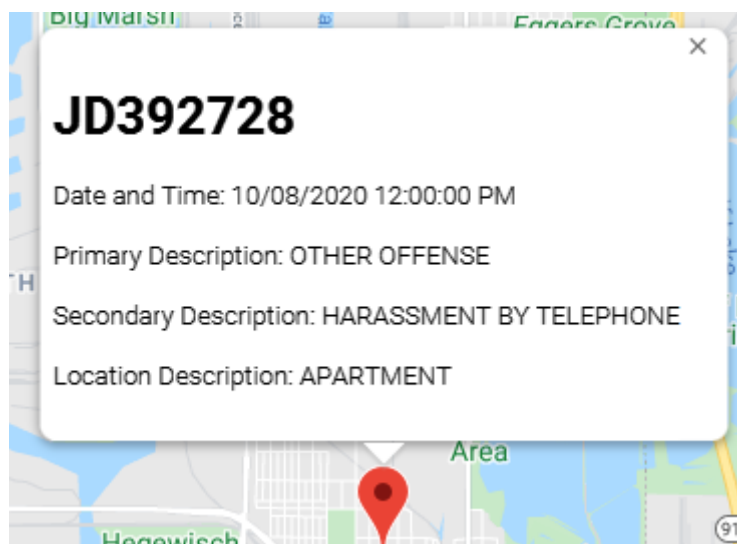


Figure 10 - An info window on a map marker

In marker mode, you can click on a record marker to open an info window containing information about that record, such as the example above (Figure 10).

8. Accessing the Internet Through Insight

In this section, we will cover:

- How to access the internet to search for crime related data using the built-in web browsing functionality

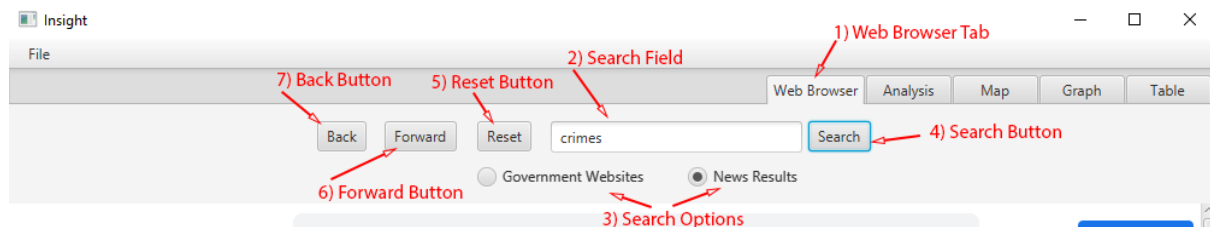


Figure 11 - Web Browser Controls Overview

You can open the browser by clicking on the 'Web Browser' tab in the main program interface.

Note: the back and forward buttons are hidden until the user executes a search.

Once the browser is open, you can enter a search query into the search field, then select whether you would like to search for government websites, or for news articles. You can then execute the search by either pressing the search button, or pressing the enter key on your keyboard.

If you have searched multiple queries and would like to go between them, you may use the back and forward buttons to go between pages in your history.

The reset button will clear all browsing history and revert the browser tab to the state it was when the application started.