# What are the software requirements?

1. Python IDE
2. R
3. Microsoft Excel

# Where to download the data?

Crime events 2019:

Crime events 2020:

Crime events with coordinates 0515-0615, 2020:

Crime number statistics 2019:

Crime number statistics 2020:

Socioeconomic data

# How to get the results?

Run the below scripts. Install required packages for the scripts.

## geocoding.py

1. package: geocoder, pandas, csv
2. variables that can be changed:
3. input\_file – input file path.
4. output\_file – output file path.
5. date - the date of crime events *of the form mm/dd/yy*

## statistic.py

1. package: pandas
2. variables that can be changed:
3. input\_file – input file path.
4. output\_file – output file path.

## ANN.py

1. package: math, pandas, numpy, scipy
2. variables that can be changed:
3. input\_file – input file path.
4. output\_file – output file path.
5. area – area of the county/city (square kilometer)
6. crime\_type – the type of crime, including Total, Arrest, Arson, Assault, Burglary, Robbery, Shooting, Theft, Vandalism, and Other

## hotspot.py

1. package: pandas, folium
2. variables that can be changed:
3. input\_file – input file path.
4. output\_file – output file path.
5. date – the date of crime events *of the form mm/dd/yy*
6. crime\_type – the type of crime, including Total, Arrest, Arson, Assault, Burglary, Robbery, Shooting, Theft, Vandalism, and Other
7. parameters:
8. location – Latitude and Longitude of Map (Northing, Easting).
9. zoom\_start – Initial zoom level for the map.
10. tiles – Map tileset to use.
11. control\_scale – Whether to add a control scale on the map.
12. data – List of points of the form [lat, lng] or [lat, lng, weight].
13. max\_val – Maximum point intensity.
14. min\_opacity – The minimum opacity the heat will start at.
15. radius – Radius of each “point” of the heatmap.
16. blur – Amount of blur.
17. gradient – Color gradient config.
18. max\_zoom – Zoom level where the points reach maximum intensity (as intensity scales with zoom).

## hotspot\_withtime.py

1. package: pandas, folium
2. variables that can be changed:
3. input\_file – input file path.
4. output\_file – output file path.
5. crime\_type – the type of crime, including Total, Arrest, Arson, Assault, Burglary, Robbery, Shooting, Theft, Vandalism, and Other
6. parameters:
7. location – Latitude and Longitude of Map (Northing, Easting).
8. zoom\_start – Initial zoom level for the map.
9. tiles – Map tileset to use.
10. control\_scale – Whether to add a control scale on the map.
11. data – list of list of points of the form [lat, lng] or [lat, lng, weight].
12. index – Index giving the label (or timestamp) of the elements of data.
13. max\_opacity – The maximum opacity for the heatmap.
14. min\_opacity – The minimum opacity the heat will start at.
15. radius – Radius of each “point” of the heatmap.
16. auto\_play – Automatically play the animation across time.
17. display\_index – Zoom level where the points reach maximum intensity (as intensity scales with zoom).

## pcc.py

1. package: pandas, scipy
2. variables that can be changed:
3. input\_file – input file path.
4. x – name of variable set x.
5. y – name of variable set y.

## Lasso.R

1. package: glmnet
2. variables that can be changed:
3. workpath – input file path.
4. loaddata – input file name.
5. parameters:
6. x – matrix of predictor variables
7. y – the response or outcome variable, which is a binary variable.
8. family – the response type. Use “binomial” for a binary outcome variable.
9. alpha – the elasticnet mixing parameter. Allowed values include:

* “1”: for lasso regression
* “0”: for ridge regression
* a value between 0 and 1 (say 0.3) for elastic net regression.

1. type.measure – the loss used for cross-validation.
2. lambda – a numeric value defining the amount of shrinkage. Should be specify by analyst.

## barchart.py

1. package: pandas, numpy, matplotlib
2. variables that can be changed:
3. input\_file – input file path.

## boxplot.py

1. package: os, numpy, pandas, matplotlib
2. variables that can be changed:
3. input\_path – root directory of crime input file.
4. pop\_file - input file with population.

## linechart.py

1. package: os, numpy, pandas, matplotlib
2. variables that can be changed:
3. input\_path – root directory of input file.
4. output\_path – root directory of output image.