Application Outline

# Weather

Purpose

Gather average weather information of each station grouped by date. Each station shall be joined together to get a better average for each date.

Requirements

Date format should be, MM/DD/YYYY. Average weather features shall be type Double.

Weather information include:

* Wx1: ∆ HOURLYDRYBULBTEMPF
* Wx2: ∆ HOURLYDewPointTempF
* Wx2: ∆ HOURLYWindSpeed
* Wx3: ∆ HOURLYRelativeHumidity

Data

Date,Wx1,Wx2,Wx3,Wx4

# Crime

Purpose

This will contain multiple run configurations for each district. For each individual district, the goal will be to sum eight distinct primary crimes, and group them by date. If there are 9 districts, then there will be 9 separate output files containing the date and summed crimes.

Requirements

Date format should be, MM/DD/YYYY. District shall be numbers 1 through 9. These districts are grouped by Community Area as listed below.

Districts include:

* 1: Far North Side (1-4, 9-14, 76-77)
* 2: North Side (5-7, 21-22)
* 3: North-West Side (15-20)
* 4: Central (8, 32-33)
* 5: West (23-31)
* 6: South-West Side (56-59, 61-68)
* 7: South Side (34-43, 60, 69)
* 8: Far South-West Side (70-75)
* 9: Far West Side (44-55)

Primary crimes include:

* C1: ∑ HOMICIDE
* C2: ∑ ROBBERY
* C3: ∑ BATTERY
* C4: ∑ ASSAULT
* C5: ∑ BURGLARY
* C6: ∑ THEFT
* C7: ∑ MOTOR VEHICLE THEFT
* C8: ∑ WEAPONS VIOLATION

Data

Date,District,C1,C2,C3,C4,C5,C6,C7,C8

# Aggregate

Purpose

Once preprocessing of the weather and crime data is organized, the functionality for aggregation is to join the datasets by date.

Requirements

Date format should be, MM/DD/YYYY.

Data

Date,Wx1,Wx2,Wx3,Wx4,District,C1,C2,C3,C4,C5,C6,C7,C8

# Neural Network

Purpose

There will be a total of 9 different networks that will be trained. This is one for each district. Within each district the actual versus predicted crime rates will be computed and assessed for correlations.

Requirements

Input will be the four weather features. Output will be the eight crime features.

# Visualization

Purpose

Plots can be used for correlations between crime rates and weather. Feature analysis is also in consideration.

# Resources

* <http://www.thechicago77.com/chicago-neighborhoods/>
* <http://home.chicagopolice.org/wp-content/uploads/2014/11/communitymap_nov2016.pdf>
* <https://towardsdatascience.com/homicide-in-chicago-data-stroytelling-part-two-e8748602daca>