Accident Severity Prediction
In
Seattle, WA

Coursera Capstone Project

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Business Understanding

Seattle DMV is interested in knowing possibility of an accident given weather and other road conditions.

Problem Statement

At any given day, predict the severity of accident given,

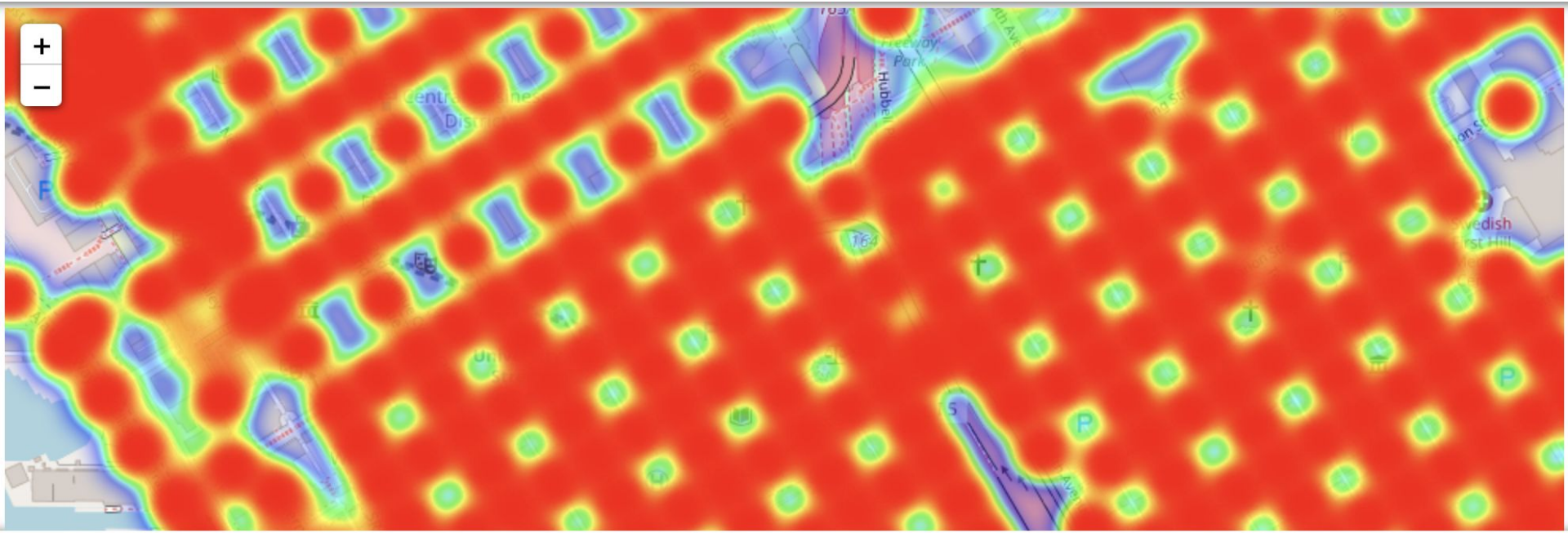
- Weather Conditions
- Road Conditions
- Light Conditions
- Mode of Travel
- Area of Travel

Data Understanding

- Available Data: Accident Data collected
- Format: CSV
- Data Size: 194673 rows x 38 columns
- Redundant or Not useful Data: 24 columns

- 70.11% Severity 1 Accidents
- 29.89% Severity 2 Accidents

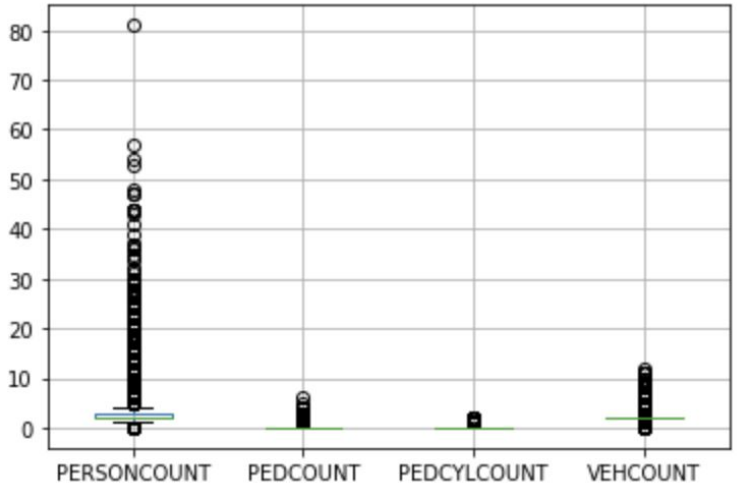
Location Heat Map



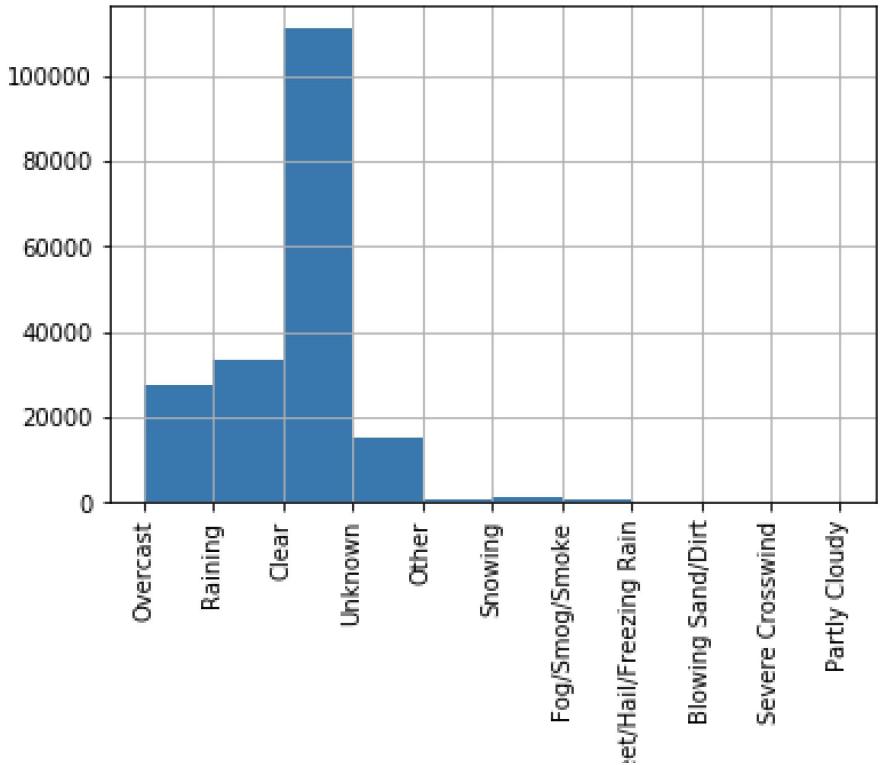
Address Type Data Segregation

- Block: 65.85%
- Intersection: 33.76%
- Alley: 0.39%

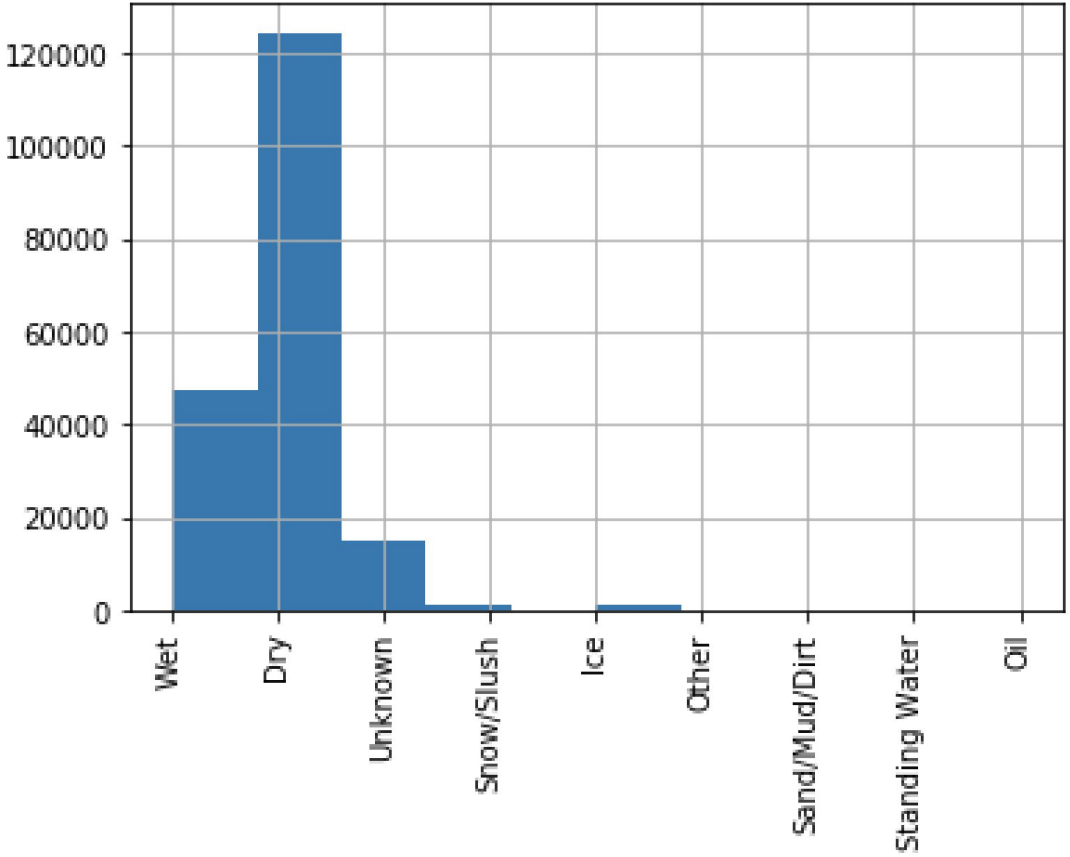
Box Plot: Person, Pedestrian, Cyclist & Vehicles Count



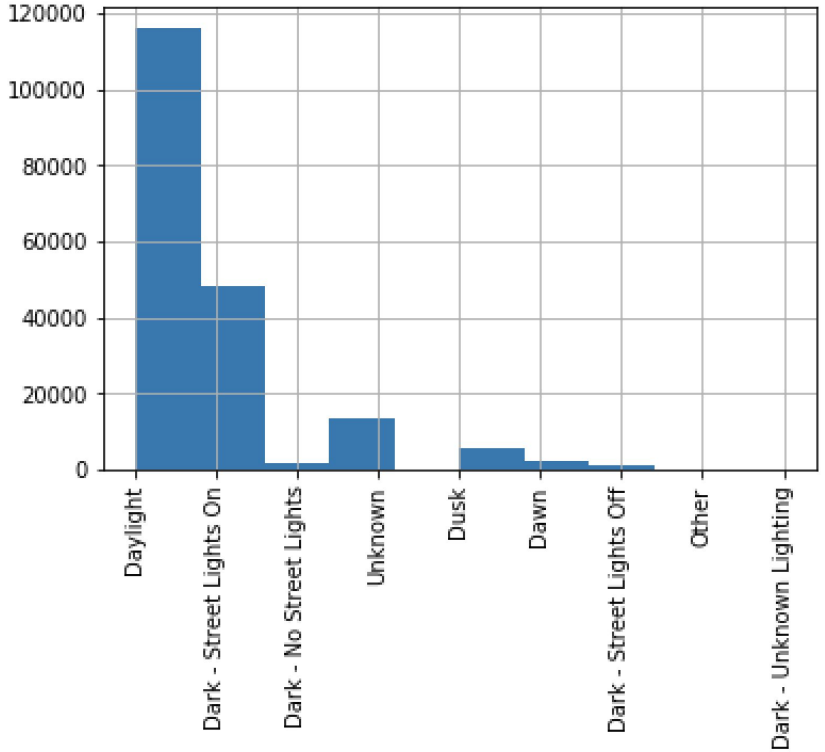
Distribution By Weather



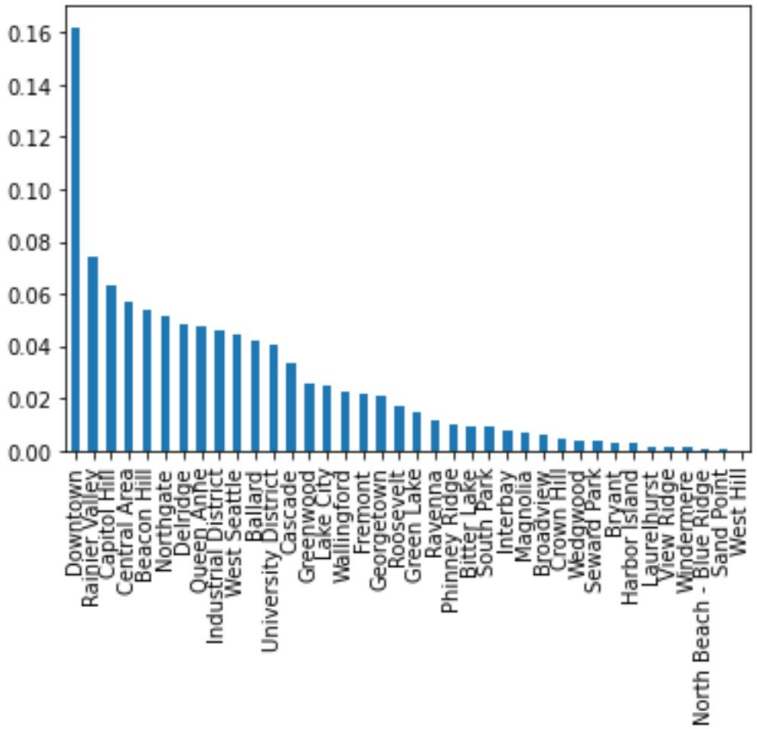
By Road Conditions



By Light Conditions



By Neighborhood



Data Modelling

Target Variable: SEVERITYCODE

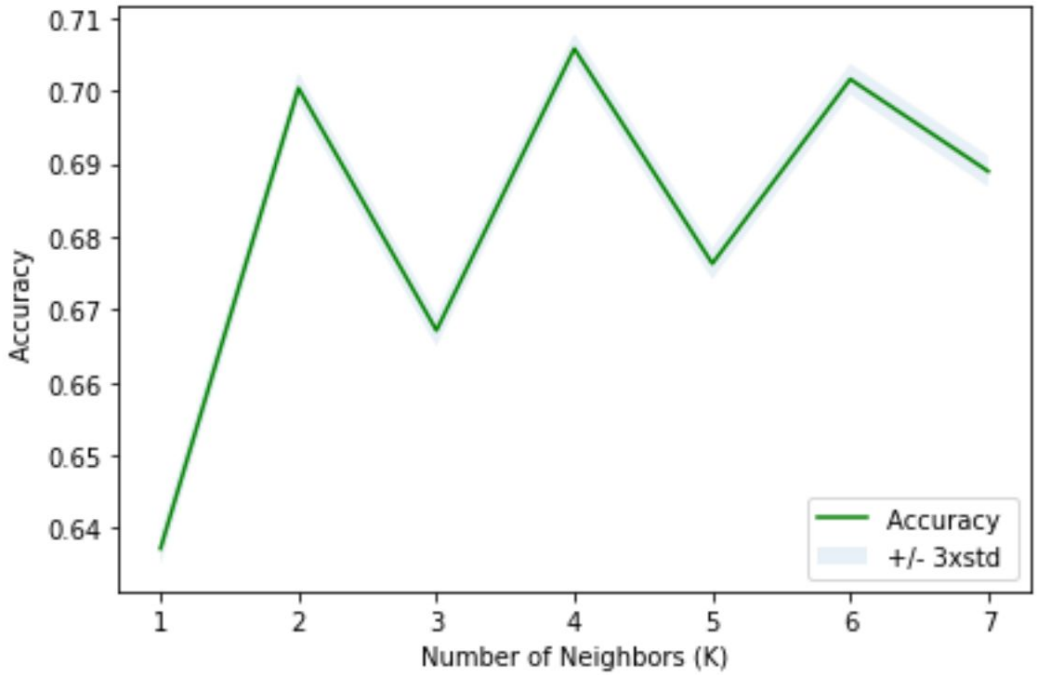
Independent Variables:

- WEATHER
- ROADCOND
- LIGHTCOND
- HITPARKEDCAR
- NEIGHBORHOOD
- PED
- CYCLIST
- VEHICLE
- DAY_PART
- SEASON

Using 70-30 train-test split

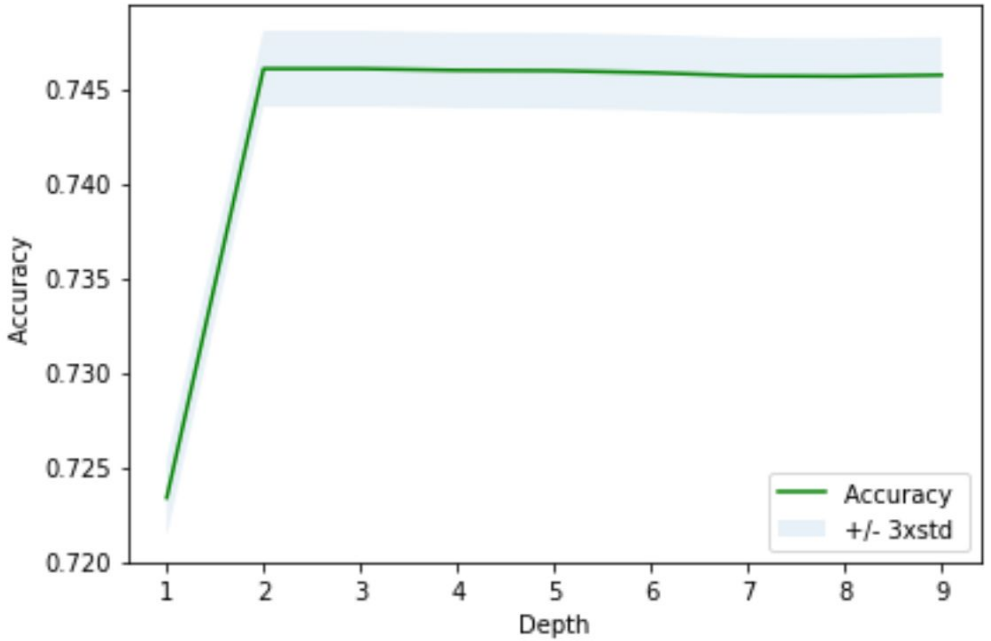
KNN

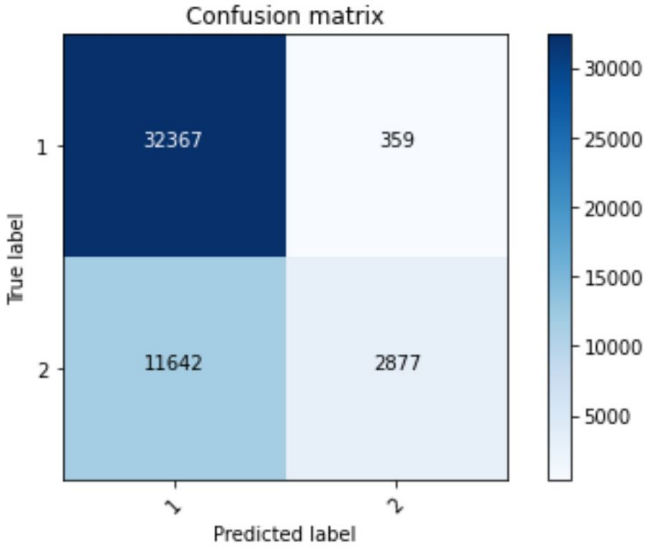
Optimal Nearest Neighbors, k = 4. Accuracy: 70.58%



Decision Tree

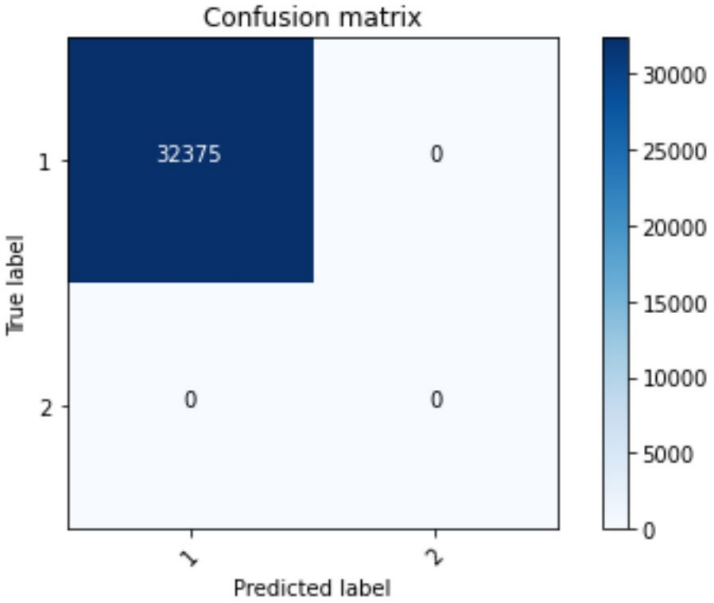
Optimal Depth, d=2. Accuracy: 70.58%





Logistic Regression

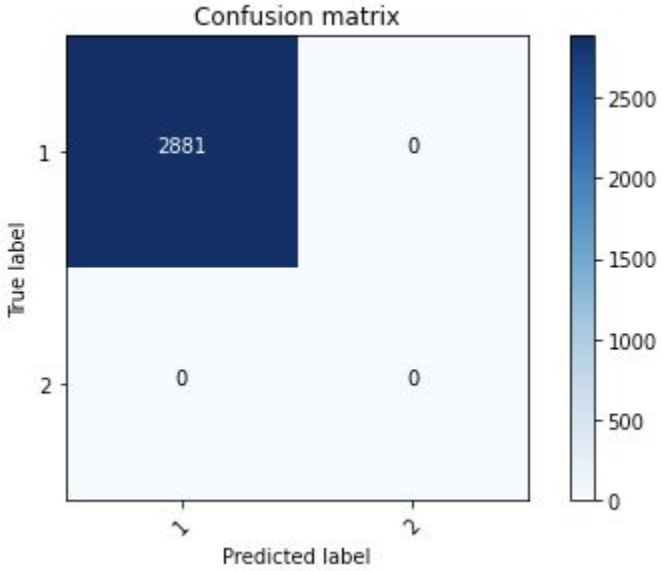
Accuracy Score: 74.54%



SVM

Kernel: RBF

Accuracy: 74.60%



Model Evaluation

Model	Accuracy	Jaccard Similarity score	F1-Score	Log Loss Score
KNN	70.58%	66.21%	79.67%	-
Decision Tree	70.58%	72.95%	84.36%	-
Logistic Regression	74.54%	72.92%	84.33%	53.86%
SVM	74.60%	72.95%	84.36%	-

Best accuracy is achieved on SVM. SVM with RBF kernel is the model of choice.