

# **The study of severity of accidents**

Final Report - Coursera capstone  
assignment

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# Introduction

- Problem statement
  - Understand the factors that increase the likelihood of accidents
- Potential application
  - An app that will prompt the drivers to be more careful depending on the weather and road conditions on any given day
  - A way for the police to enforce more safety protocols.

# Data

- Data Store
  - Data set from the Seattle Police Department, with over 190,000 observations collected over the last 15+ years
- Attributes required
  - ADDRTYPE
  - WEATHER
  - ROADCOND
  - VEHCOUNT
  - PERSONCOUNT.

# Methodology

- IDE: Jupyter Notebooks
- Language: Python
- Libraries: Pandas, Numpy, Matplotlib, and Seaborn
- Analysis approach: graphical representation to see correlation between various variables

# Data Preparation

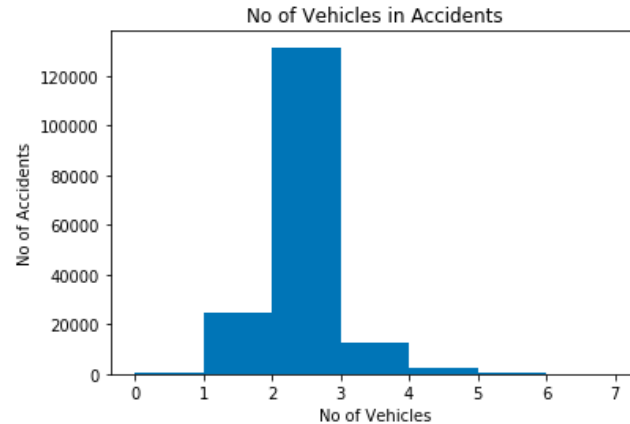
- Dropped the columns we do not need from the dataset
- Columns that do not have values or where the values are unknown
- Dropped Speeding entirely because it is missing over 180,000 values and this can hamper the results

# Result

- Analysis of no of vehicles in accident

```
In [39]: bins = np.arange(Car_Accidents.PERSONCOUNT.min(), 8, 1)
plt.hist(Car_Accidents.VEHCOUNT, bins = bins)
plt.xlabel('No of Vehicles')
plt.ylabel('No of Accidents')
plt.title('No of Vehicles in Accidents')
```

```
Out[39]: Text(0.5, 1.0, 'No of Vehicles in Accidents')
```

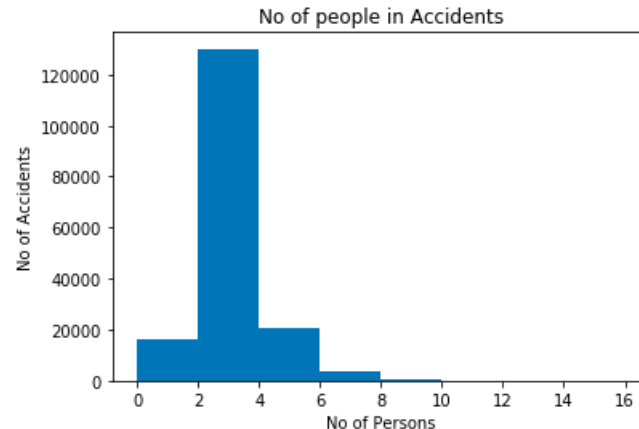


# Result (Continued)

- Analysis of no of people in accident

```
In [43]: bins = np.arange(Car_Accidents.PERSONCOUNT.min(), 17, 2)
plt.hist(Car_Accidents.PERSONCOUNT, bins = bins)
plt.xlabel('No of Persons')
plt.ylabel('No of Accidents')
plt.title('No of people in Accidents')
```

```
Out[43]: Text(0.5, 1.0, 'No of people in Accidents')
```



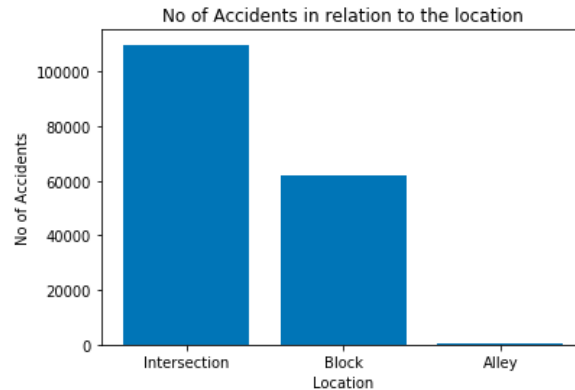


# Result (Continued)

- Analysis of accidents in relation to location

```
In [44]: X = Car_Accidents.ADDRTYPE.unique()
Data = Car_Accidents.ADDRTYPE.value_counts()
plt.bar(X,height=Data)
plt.xlabel('Location')
plt.ylabel('No of Accidents')
plt.title('No of Accidents in relation to the location')

Out[44]: Text(0.5, 1.0, 'No of Accidents in relation to the location')
```

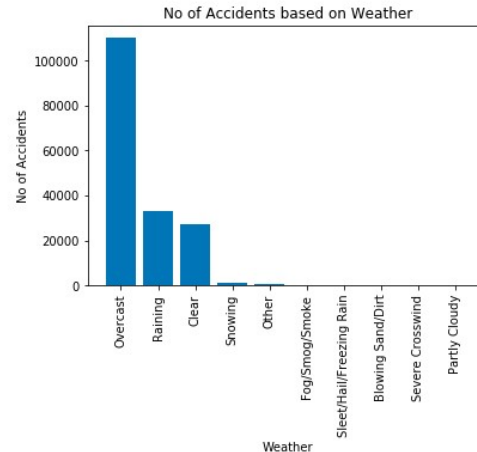


# Result (Continued)

- Analysis of accidents Based on Weather

```
In [45]: X = Car_Accidents.WEATHER.unique()
Data = Car_Accidents.WEATHER.value_counts()
plt.bar(X,height=Data)
plt.xlabel('Weather')
plt.ylabel('No of Accidents')
plt.title('No of Accidents based on Weather')
plt.xticks(rotation = 90)

Out[45]: ([0, 1, 2, 3, 4, 5, 6, 7, 8, 9], <a list of 10 Text xticklabel objects>)
```

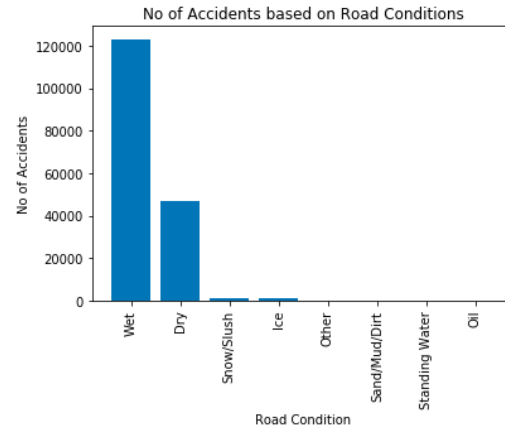


# Result (Continued)

- Analysis of accidents based on Road condition

```
In [47]: X = Car_Accidents.ROADCOND.unique()
Data = Car_Accidents.ROADCOND.value_counts()
plt.bar(X,height=Data)
plt.xlabel('Road Condition')
plt.ylabel('No of Accidents')
plt.title('No of Accidents based on Road Conditions')
plt.xticks(rotation = 90)

Out[47]: ([0, 1, 2, 3, 4, 5, 6, 7], <a list of 8 Text xticklabel objects>)
```



# Discussion and Recommendation

- Data was a good size, but there were a number of missing elements and we needed to clean the data in order to get a good result
- We had to drop 'SPEED' because there were too many missing elements but I think that is an important factor that should be considered
- From the analysis, it is clear that most accidents involve solo drivers, on wet roads, bad weather, at intersections, and are minor in nature
- This could be helpful to the police department in understanding where to install more stop signs, or maybe adding cameras to intersections to compel people to slow down
- We can develop some inbuilt technology in our cars that warn us when the road and weather conditions are bad, or the car is approaching a stop sign

# Conclusion

Although this analysis has given us some good insight, there needs to be a closer inspection of certain other variables. It seems like a lot of these accidents are minor and avoidable. Having said that there is still a considerable amount of loss of property and these findings can be helpful to the Seattle PD in enforcing some new measures to prevent future accidents.