CAR ACCIDENT SEVERITY PREDICTION

SEATTLE

INTRODUCTION

- Approximately 1.35 million people die each year as a result of road traffic crashes.

- The 2030 Agenda for Sustainable Development has set an ambitious target of halving the global number of deaths and injuries from road traffic crashes by 2020.

- Road traffic crashes cost most countries 3% of their gross domestic product.

- More than half of all road traffic deaths are among vulnerable road users: pedestrians, cyclists, and motorcyclists.

- 93% of the world's fatalities on the roads occur in low- and middle-income countries, even though these countries have approximately 60% of the world's vehicles.

- Road traffic injuries are the leading cause of death for children and young adults aged 5-29 years.

WHAT CAN BE DONE

By implementing road safety prediction applications, we can achieve several goals:

- Enlighten for the local officials points where they need to assemble their resources for more effective service on the road.

- Implement road warnings about road traffic conditions.

- Using predictive information for regulating speed limits on the road.

- In conclusion, we will prevent incidents rather than spending resources on the treatment of their consequences.

DATA CONTAINS AS NUMERICAL
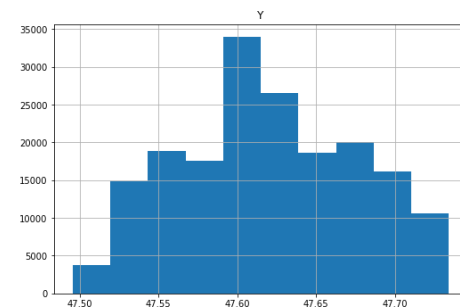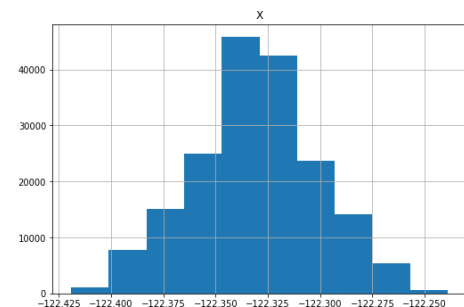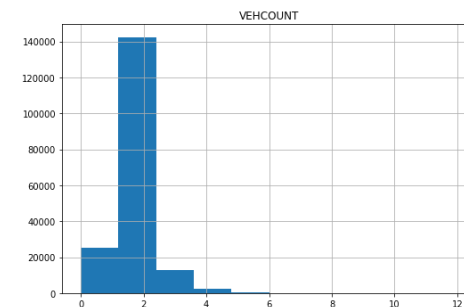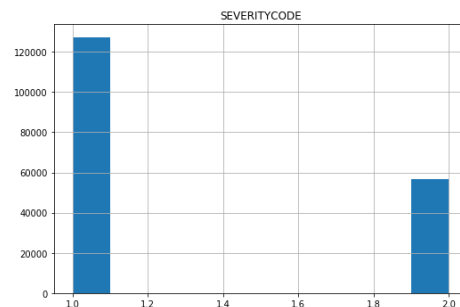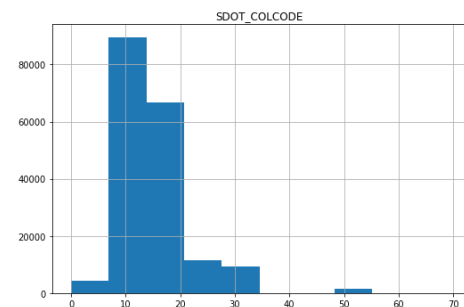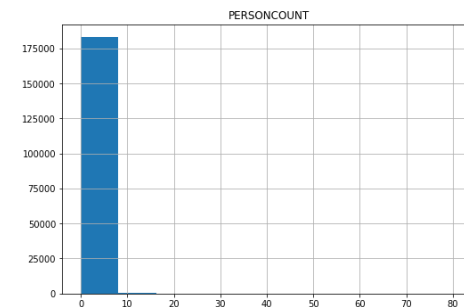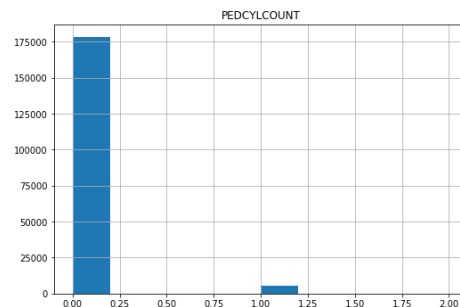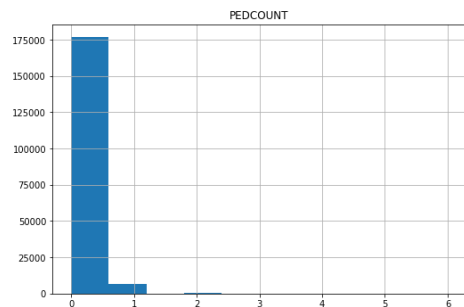
AS OBJECT DATA TYPE

```
Parked Car     44301
Angles         34411
Rear Ended     33551
Other          22977
Sideswipe      18233
Left Turn      13619
Pedestrian      6431
Cycles          5312
Right Turn      2918
Head On         1996
Name: COLLISIONTYPE, dtype: int64
```

```
Clear                    109181
Raining                   32687
Overcast                  27287
Unknown                   12229
Snowing                     878
Other                       743
Fog/Smog/Smoke              554
Sleet/Hail/Freezing Rain    112
Blowing Sand/Dirt            48
Severe Crosswind             25
Partly Cloudy                 5
Name: WEATHER, dtype: int64
```

TO USE SOME FEATURES FOR OUR MODEL WE SHOULD CHANGE THEIR TYPE

- ADDRTYPE
- PERSONCOUNT
- PEDCOUNT
- PEDCYLCOUNT
- VEHCOUNT
- WEATHER
- LIGHTCOND
- SPEEDING
- INATTENTIONIND
- UNDERINFL
- HITPARKEDCAR

Address type, weather, speeding, lighting condition and some other features were converted to numbers. For example:
- 1-bright daylight,
- 2-dust/dawn,
- 3-dark with lights on,
- 4-dark with no light

MODEL RESULTS AND HOW TO INCREASE ACCURACY

```
Model Accuracy:  0.7308477145522388


              precision    recall  f1-score   support

          1       0.72      0.98      0.83     23142
          2       0.82      0.22      0.35     11162

  micro avg       0.73      0.73      0.73     34304
  macro avg       0.77      0.60      0.59     34304
weighted avg       0.75      0.73      0.67     34304
```

The model struggles from predicting accidents with high accuracy, so it might be needed to change dataset for implementing more reliable models.

IN THE CONCLUSION

- Accidents involved pedestrians and bicyclists have the most sever consequences. It is recommended to implement more safety measures on roads. Marked crosswalks, special bike lanes and warning signs.

- The most influencing features: drunk drivers, inattention, speeding, light condition. These issues can be managed by informing drivers and implementing periodical checking of road light conditions and drivers' behavior. Traffic cameras with machine learning algorithms for recognizing speeding and drunk drivers might be helpful.

- The most congested intersection should be redesigned as they concentrate the most accidents with injuries.

- Some improvements to the dataset can be implemented, such a geopositioned data. Now it can't be used to discover the most dangerous places on the road for future investigation and improvement because they contain a mean for lanes and roads where accidents occurred.