Car Collisions Analysis Report

Introduction

Car accidents have a huge social, economic and environmental impact to our world. In 2013, 54 million people worldwide sustained injuries from traffic collisions. This resulted in 1.4 million deaths in 2013, up from 1.1 million deaths in 1990. About 68,000 of these occurred in children less than five years old. Almost all high-income countries have decreasing death rates, while the majority of low-income countries have increasing death rates due to traffic collisions. Middle-income countries have the highest rate with 20 deaths per 100,000 inhabitants, accounting for 80% of all road fatalities with 52% of all vehicles.

It would be very important to predict the severity of a car accident and warn the drivers, in advance and on time, in order to drive more safely or even to adjust their journey.

Thus, the aim of this project is to apply quantitative methods and create a model that predicts the severity of a car accident base on weather and road conditions, traffic jam etc.

The further development of machine learning is critical and will play a crucial role on improving our lives in the following years.

The Data

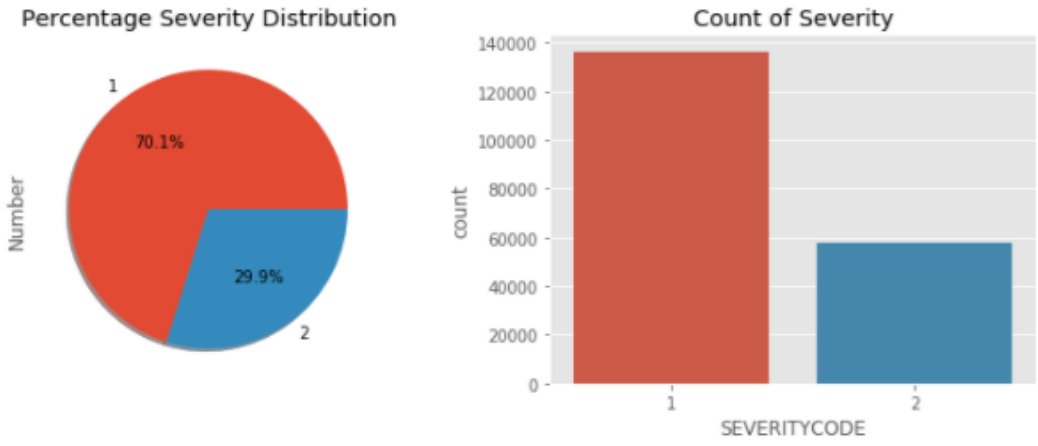
The dataset is from Seattle City and contains details of traffic accidents in Seattle for the year of 2004 – 2020. The data will be use in the report to analysis car collisions.

The features of dataset contain all sort of information about the severity code, location, Object ID, Inckey, Coldet Key, Report No., Status, Address Type, Except tran code, Except rsn Desc, Serverity Desc, Collision Type, Person Count, Pet Count, Ped cyc count, Vehicle count, Date, Incident No, Junction Type, SDOT_COL CODE, Weather, Road Condition, Light condition, Speeding. Total 38 columns.

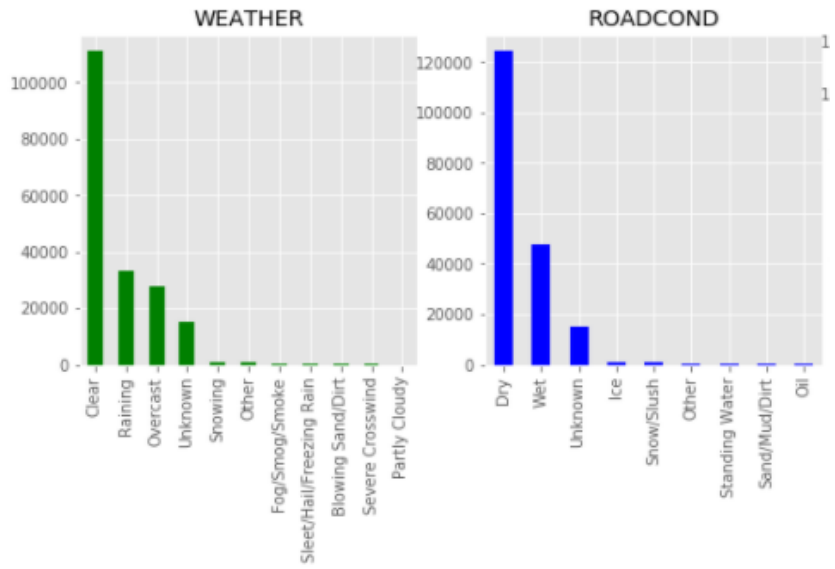
The type of data is combination of integers, floats, Boolean, objects etc. All the data has been cleaned and presented in an appropriate format. There were many adjustment to the columns related to the data and time data. All the nan or missing data and negative values has been removed.

Methodology

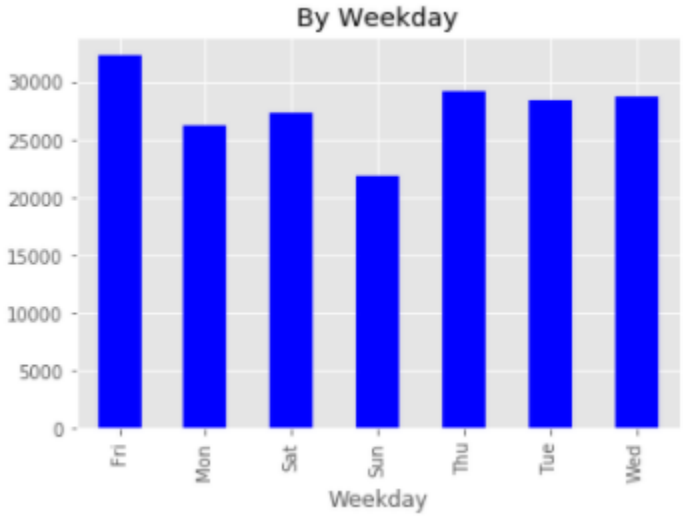
Following the cleaning and preparation process, a representation of data is taking place, in order to gain useful information, in an easy and quick way. For the representation of our target value we can conclude than most of the accidents can be categorized in the severity level 1, as show below.

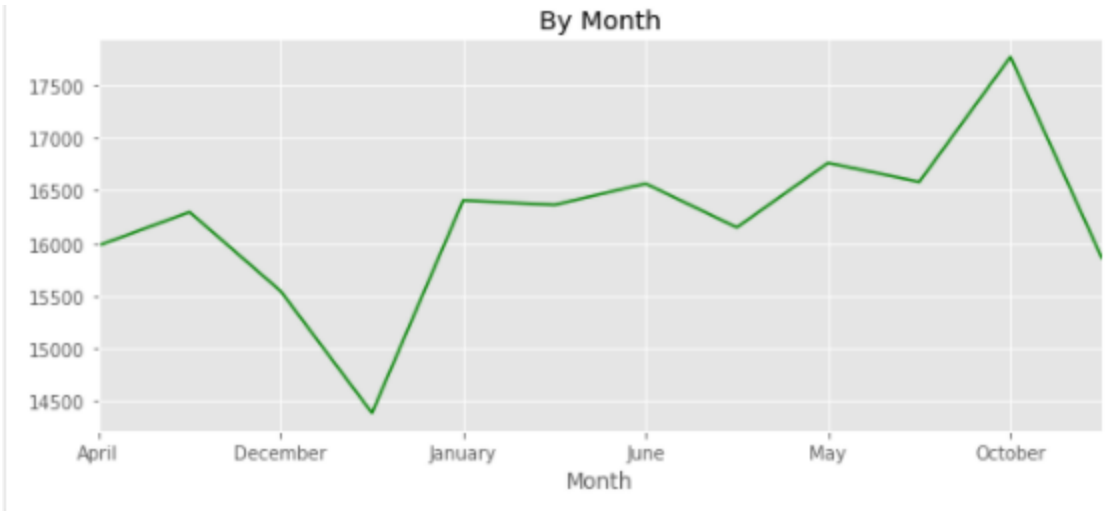


Another, interesting thing is to see the distribution of Severity in relation to the weather. And as we can see the chart, the most accident are happening on good weather.

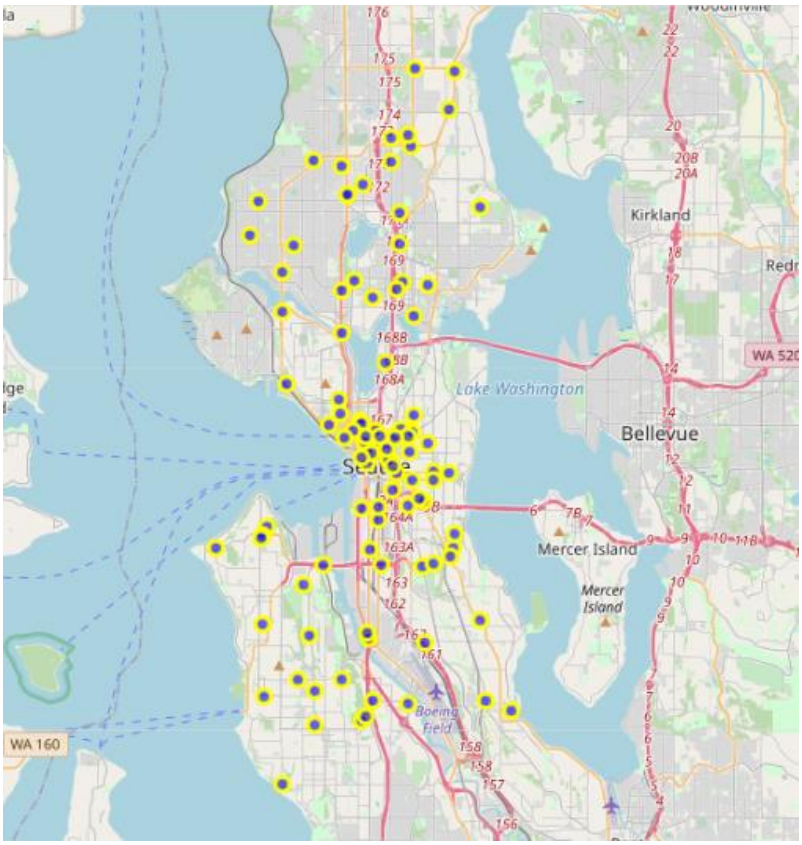


Also, let's have a look at how the weekdays and the months affect the number and severity of car accidents. Based on the data we can easily notice that on Sunday have significantly lower accidents than the other weekdays and that most of the accident are taking place in October.





Furthermore, we see the distribution of the car accident in map. More car accident happened near downtown area, and spread out around.



Result

From the data I analysis in the report. I find some interesting things about car accident.

First, more car accident happened on Friday and less on Sunday. This may direct to people want to back home from work at the end of workday more hurry than normal workday and ready for good weekend. On, Sunday most people stay home and that may be the reason to less car accident.

Second, the speeding not the main reason of the car accident. Only 4.79% of case with speeding occur. Therefore, speeding is not the main reason of car accident but it will lead to level 2 severity accident.

Third, most car accident happened on clear weather, dry load condition, and good light condition. So, those elements all not the main reason.

Discussion

As more and more car accident happening in each year, we need to find way to reduce car accident. First, pull into traffic slowly. Stop, Look, Listen. Be aware of blind spots, including those in rear view mirrors and behind windshield pillars or highway road signs. Second, watch for red light runners. Count to three before entering an intersection on a green light. Look both ways and be sure no one is trying to speed through a yellow light. Exercise caution when passing semis. Third, keep at least one hand on the steering wheel. Reduce in-car distractions such as changing radio stations or CDs, cell phones, eating or momentarily taking a hand off the wheel. Forth, scan 12 seconds ahead. Always concentrate on the area where you will be driving in 10-12 seconds. For highway driving, keep positioned far enough from other cars so if someone were to suddenly stop or swerve, you could avoid them.

Americans are covering more miles, and are more distracted, than they were a decade ago. Safety technology can only do so much to offset risky driving behavior. Reducing distractions, from smartphone

use to eating while driving, can help drivers remain alert and able to react quickly, giving them a better chance to avoid an accident.

Conclusion

After analysis all the data of car collision in Seattle, US, 2004-2020. We find out some interesting point from the data. Such as more car accident happened on Friday and less car accident on Sunday. Also, October have highest amount of car accident and lowest month is February. And most of car accident happened in a good weather and good environment, so I think the main point cause car accident will be driver not pay enough attention on drive.