

Car accident severity

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August 2020

1- Introduction to the Problem:

Road accidents have become very common nowadays. As more and people are buying automobiles, the incidences of road accidents are just increasing day by day. Furthermore, people have also become more careless now. Not many people follow the traffic rules. Especially in big cities, there are various modes of transports. Moreover, the roads are becoming narrower and the cities have become more populated. So In this project I will use Car accidents database in Canada and python libraries to **discuss**:

- factors that causes car accidents
- losses caused by car accidents
- factors that reduce car accidents

and predict:

- if the road safe or dangerous
- roads that are safe
- how to reduce car accidents

2- Data Description:

The database that I will use: [National Collision Database 2017](#)

it contains all accidents happened in Canada in 2017 This database provides:

- accident information: date, weather condition, road condition, etc.
- vehicle information: id, type, model year
- personal information: sex, age, medical treatment, etc.

This database has 289841 case and 23 Attribute

3- Data cleaning:

First, I removed unknown and non-found data. So, the rows count became 165646

Then, I removed these columns:

- V_ID: The id of the vehicle
- P_ID: The id of the person
- C_CASE: The case number of the accident
- C_WDAY: the day of the accident
- C_TRAF: the traffic condition
- C_VEHS: Number of vehicles involved in collision
- P_PSN: Person position
- C_YEAR: Year of the accident

So, the number of columns became 15

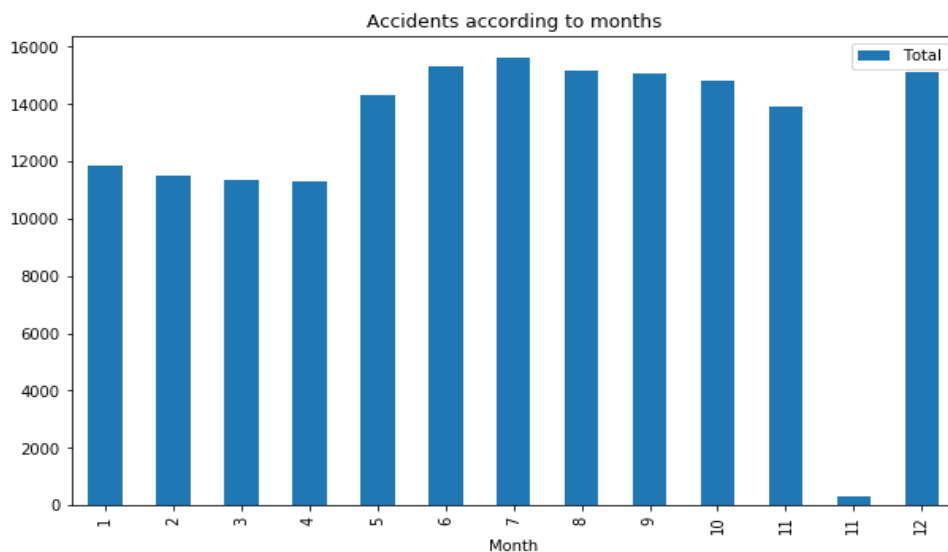
Finally, I reset the index of the dataset

So, the data became 165646 row x 15 column

4- Data Analysis:

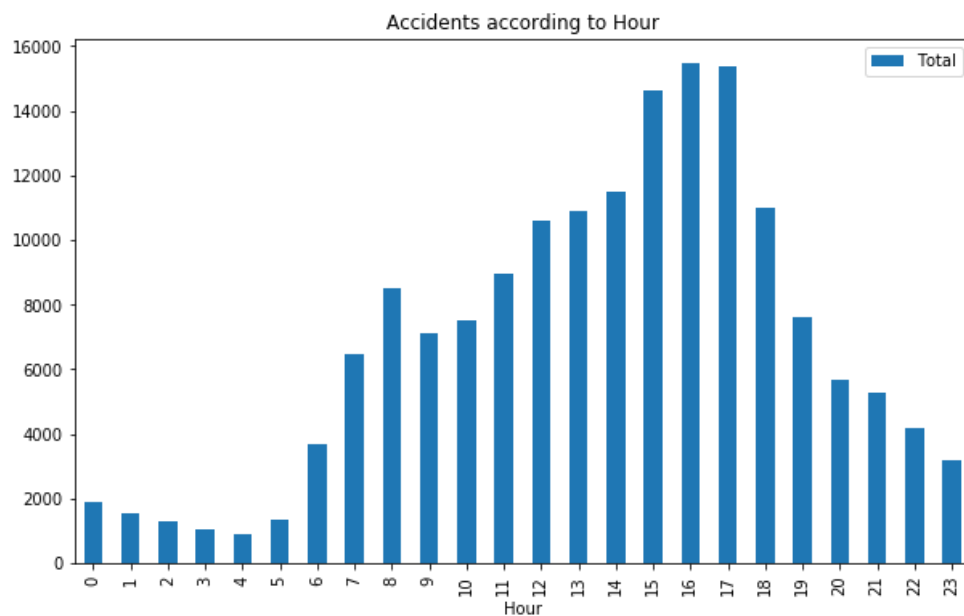
I used python modules to visualize the dataset so, I made many relationships:

- Number of accidents every Month



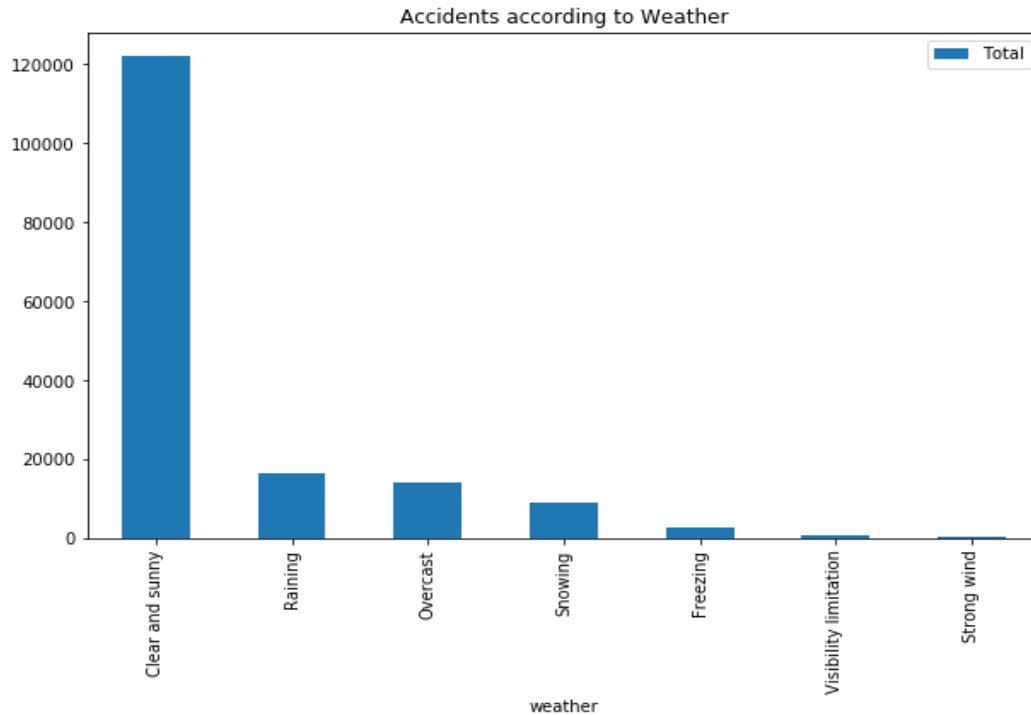
From this graph we deduce that accidents happen normally in all months, but in November number of accidents are reduced extremely and that is because the holidays in Canada

- Number of accidents every hour



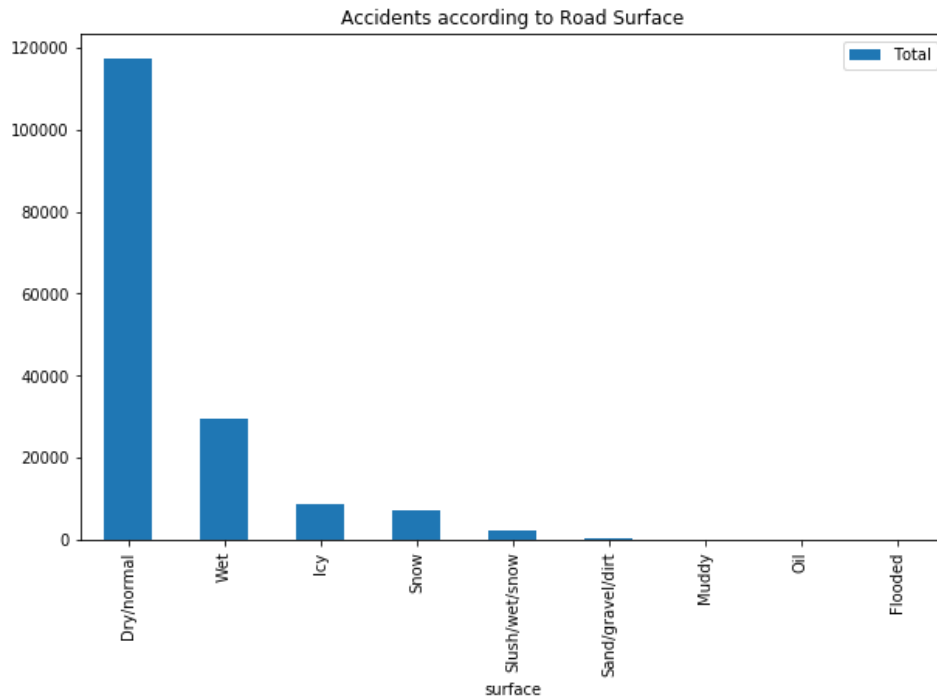
From this graph we observe that most accidents occur between 3 pm to 6 pm and accidents are less from 6pm to 6am

- Relationship between weather and accidents



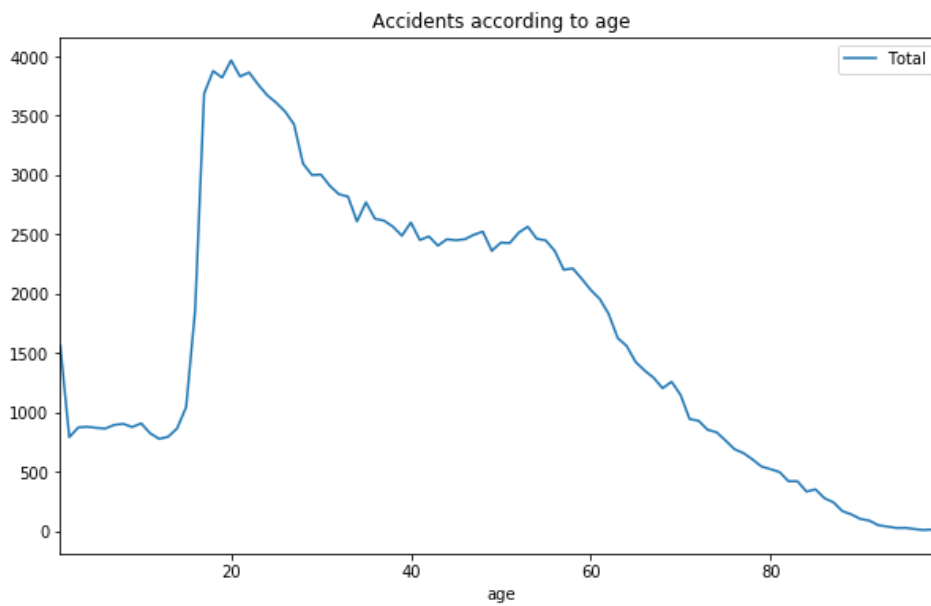
From this graph we observe that 73% of accidents didn't occur by weather effect, but weather causes 27% of accidents in Canada

- Relationship between Road Surface and accidents



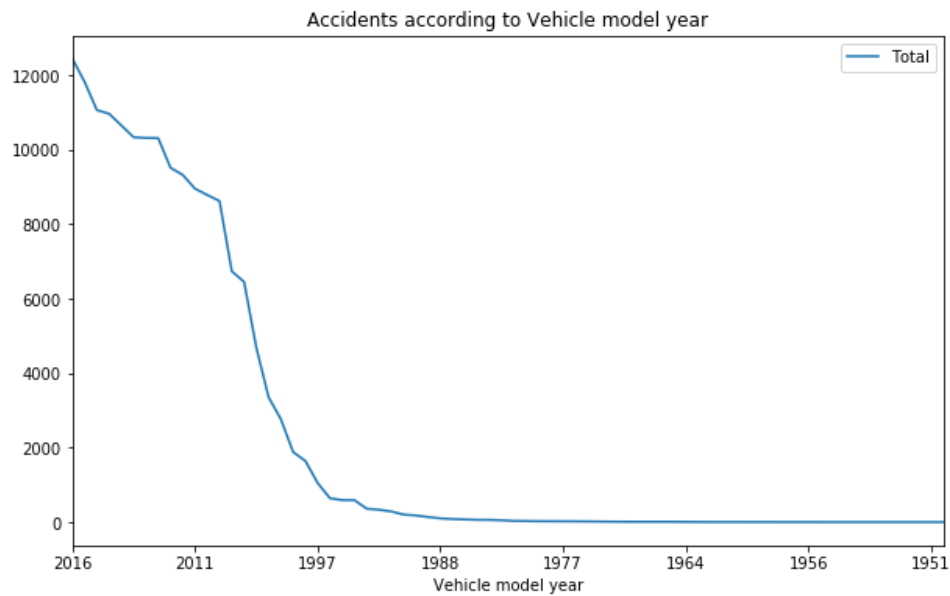
From this graph we observe that wet roads have more impact on accidents

- Relationship between age and accidents



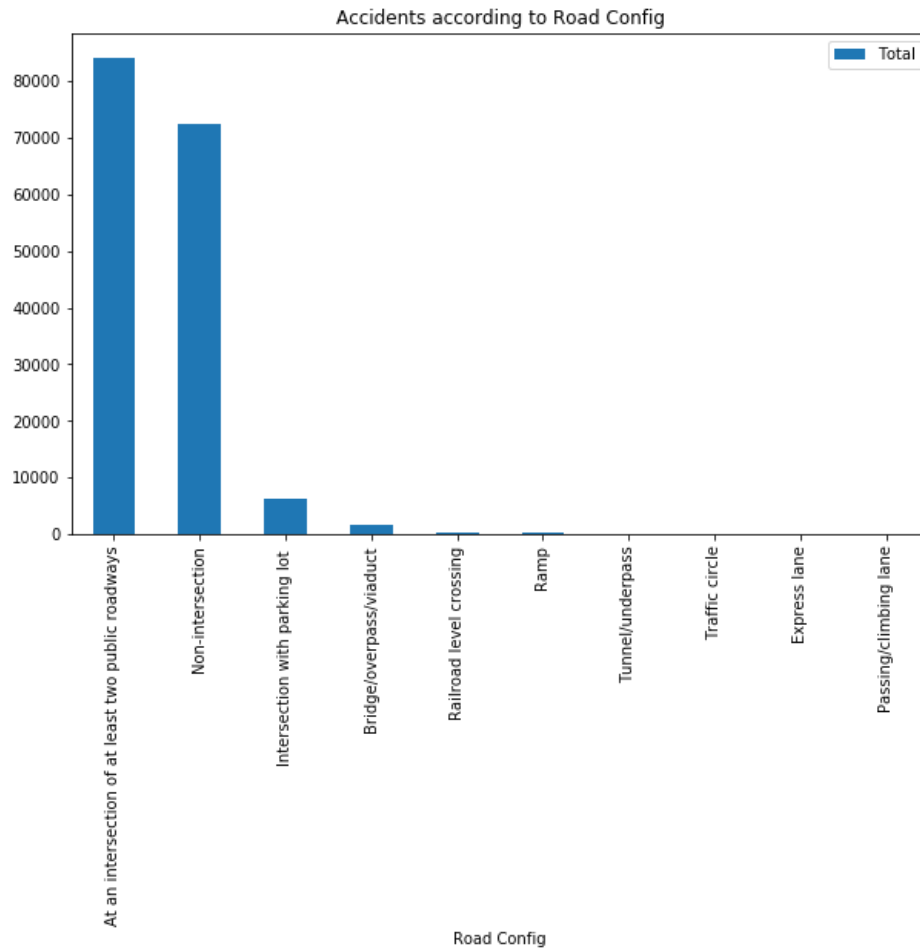
From this graph we observe that the most age that has accidents is 20s

- Relationship between Vehicle model year and accidents:



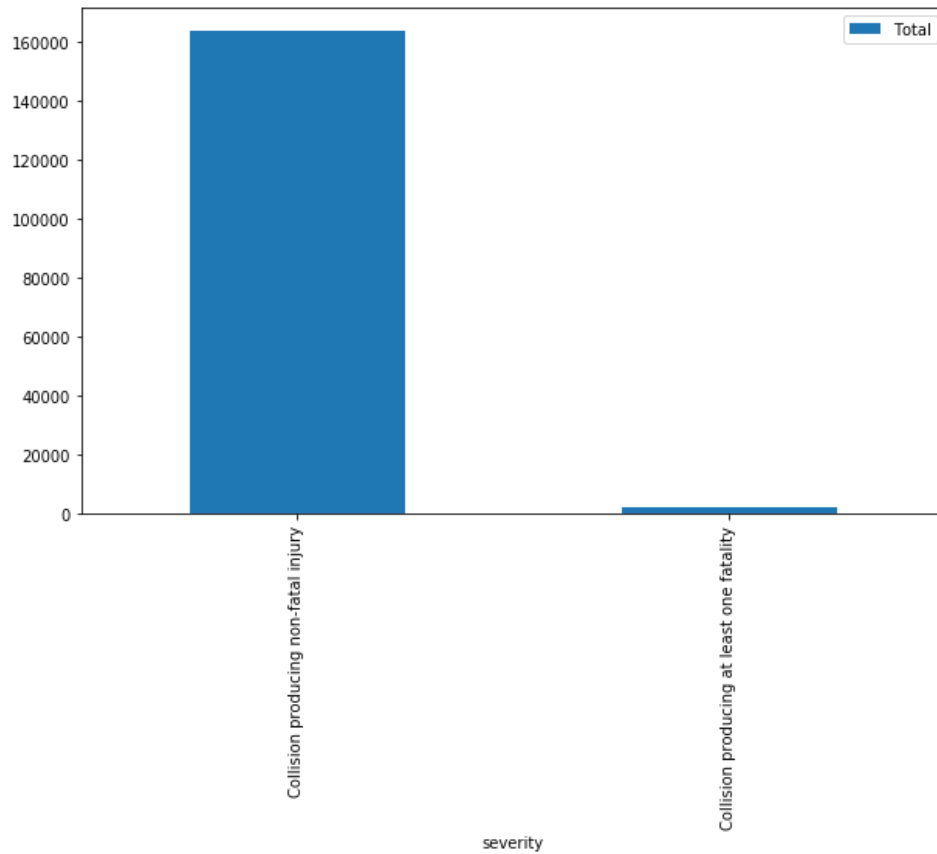
From this graph we observe that newer cars have more accidents than older cars

- Relationship between Road Config and accidents:



From this graph we deduce that the roads with intersection of two ways has more accidents

- Relationship between severity and accidents:



From this graph we observe that 99% of accidents don't produce fatalities

4- Results:

I deduced that there are many factors that causes accidents which are:

- Weather: about 27% occurred when the weather isn't good
- Road surface: about 30% of accidents occurred when the road surface isn't good
- Road config: most of accidents happened when the road has two intersecting ways

Also, some factors don't have impact:

- Age: most accidents happened where the driver is 20-40 years
- Vehicle model year: most accidents happened with cars with model year is from 2000s

2% of accidents produced fatalities which indicates good medical treatment and safety in the cars

5-Discussion:

The government should take care of factors that causes accidents:

- When the weather isn't good, car drivers should increase safety
- Government should improve roads and clean them regularly
- At intersecting roads there should be more police traffics

Medical Treatment in Canada is very good

6-Conclusion:

Medical Treatment in Canada is very good

Factors of accidents:

- Weather
- Road surface
- Road config