

## **Introduction:**

Car accident is one of the most critical life changing action. It affects not only the driver but also the whole society. Road traffic injuries are currently estimated to be the eighth leading cause of death across all age groups globally, and are predicted to become the seventh leading cause of death by 2030. beside of that, it costs millions of dollars yearly. Hence, it is important to find a model to predict the severity of accident and the relationship with surrounding condition. So, The Government and other related service organizations can take proper actions to prevent sever accidents and predict the resources which are needed to react adequately.

Machine Learning is the best choice to predict required info in real time regarding multi-factorial and sophisticated environment.

target audience: Government agencies, healthcare service provider, and Traveler.

## **Data understanding:**

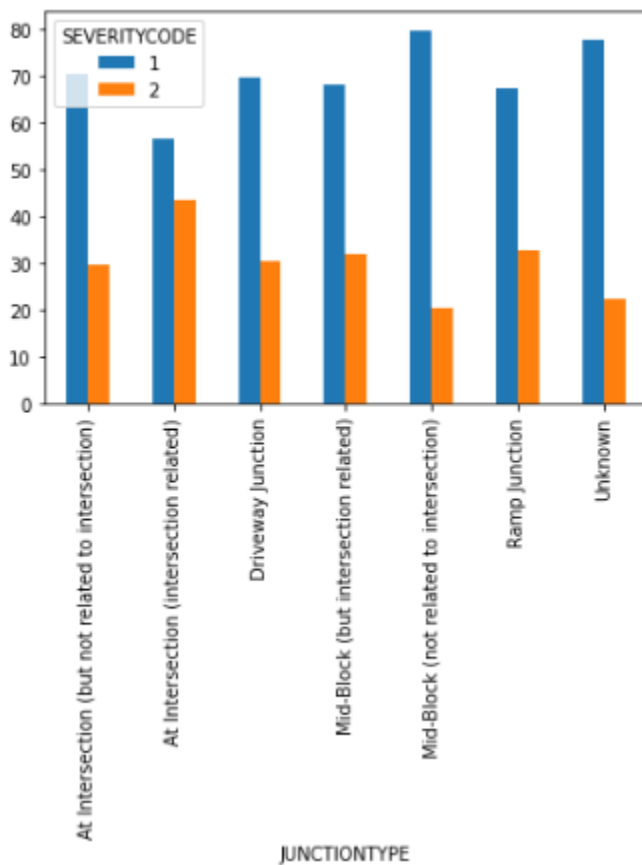
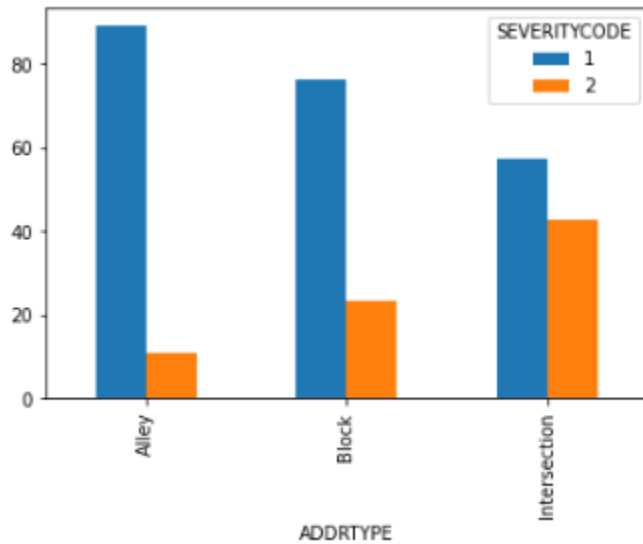
To resolve this problem, we need a dataset contain information about accidents and the factors which may lead to them such as the Traffic Records Group from Seattle:

- Features which may help us :( address type, junction type, inattention of driver, drugs or alcohol usage, weather condition, light condition, whether pedestrian right of way, speed, existing of parked car, where collusion occurred lane segment or crosswalk or intersection)
- severity of these accidents: (type of collision; count of persons, pedestrians, vehicle, and bicycles involved; severity code; SDOT code).

In my opinions all these info is needed by different organizations to plane to prevent accidents and also to prepare enough resources to manage them.

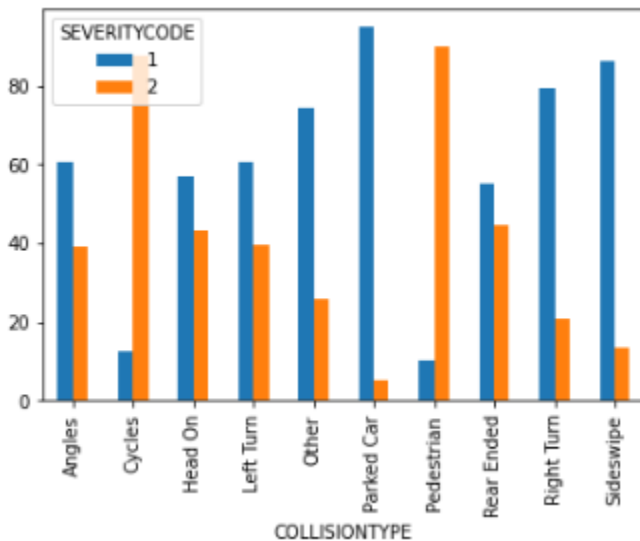
Here I will describe some examples how some features related to severity with charts:

Address type & junction type:



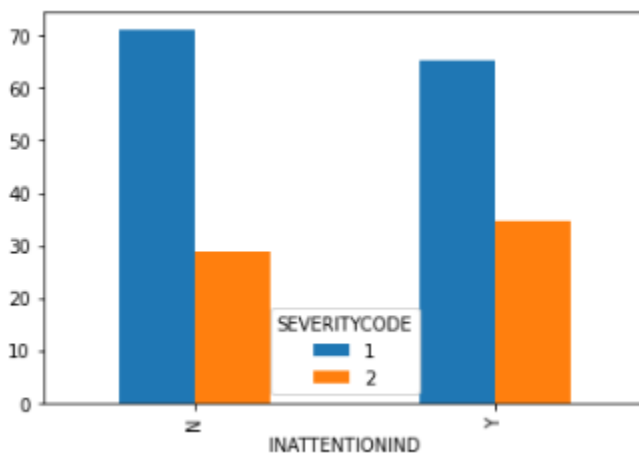
**We notice that intersections and related to them have more sever accidents**

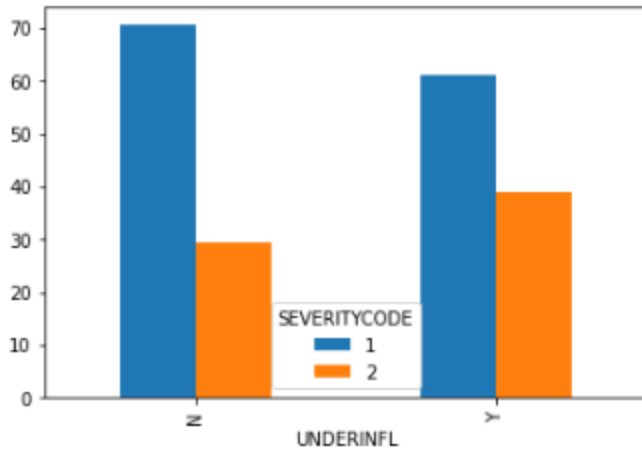
**Collision Type:**



**Angles, Cycles ,Head On ,Left turn ,Pedestrian, Rear ended have more severity**

**Inattention, Drugs, and alcoholism:**

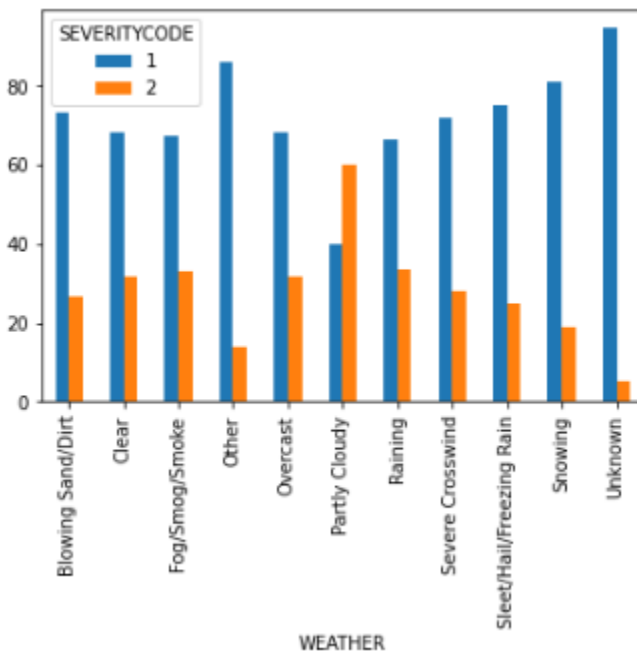




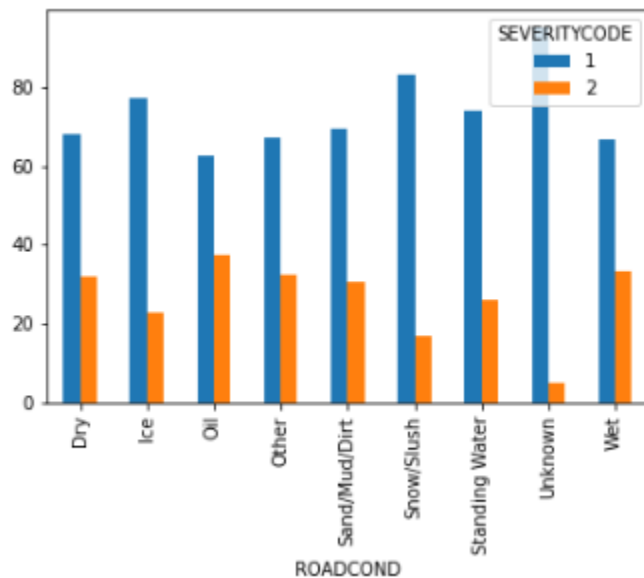
Also, they are combined with more sever accidents

### Weather:

Bad weather conditions (such as fog,wind,cloud,rain.. etc) lead to more sever accidents.



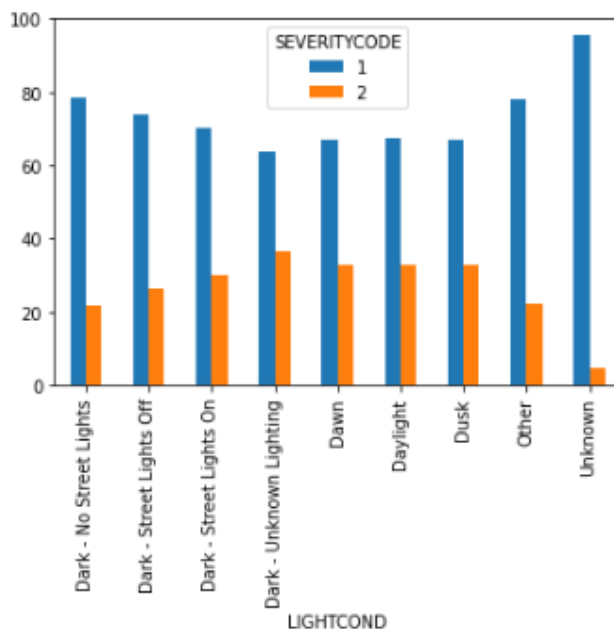
### Road condition:



We notice that there is an increase in severity related to wet, oil, and dry>

Paradoxically, snow and slush have lower severity but this is not meaning that the number of accident lower this is about the present of severity which is our concern here.

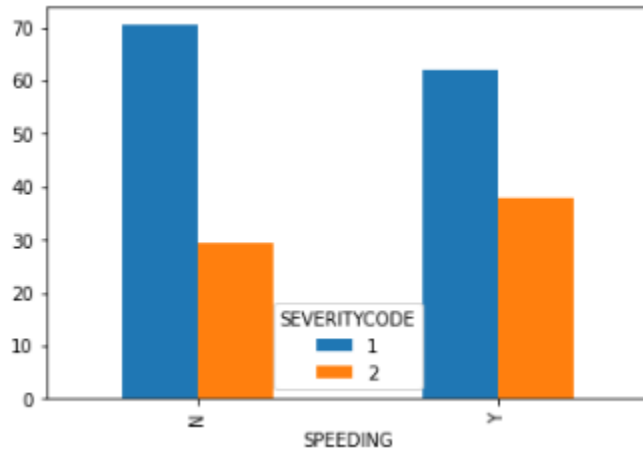
### Light condition:



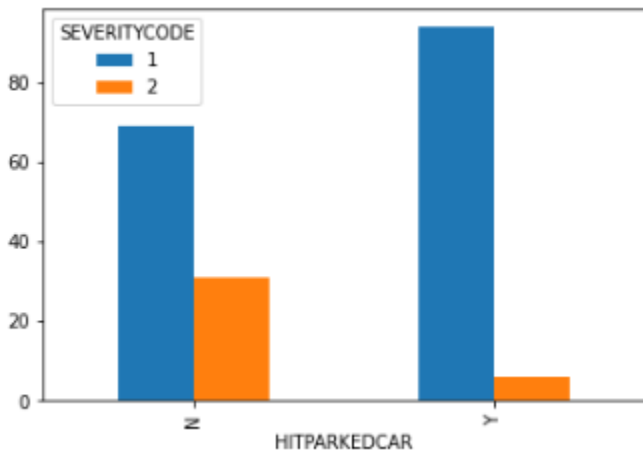
There is little increase in severity in dawn, dusk, and day light .

### Speeding:

It leads to more sever accidents



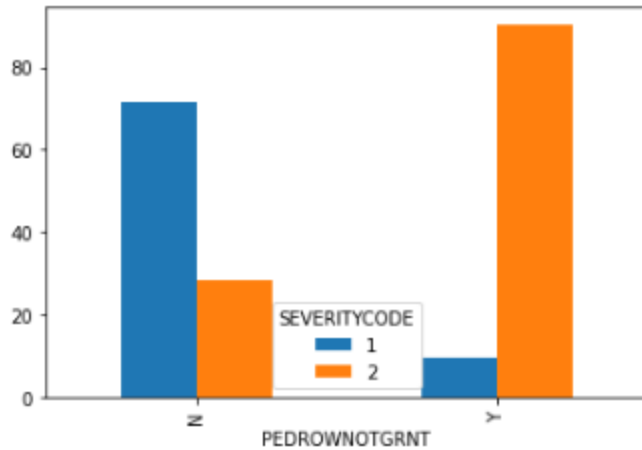
### Parked car:



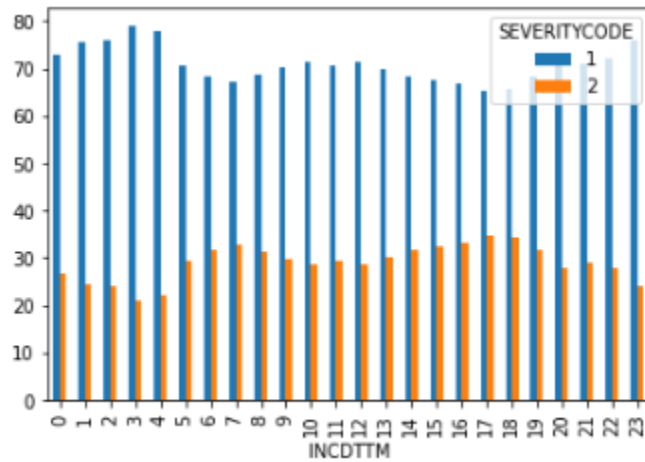
If parked care existed in the accident, we can predict lower severity

### pedestrian right of way:

combined with higher severity



**Time :**



**There is an increase in severity between 5-8 am and 15-19 pm**

**Correlation between severity and numeric features:**

**From the heat map, we notice that there are only weak correlations with numeric features.**

