Predicting the severity of car accidents in Great Britain
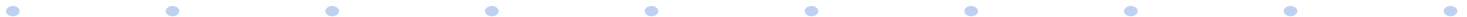
Background

- Road safety and the occurrence of car accidents has been one of the biggest concerns across the world and on average, five people die every day on the road in Great Britain and countless more are seriously injured.

- The UK local government can gain more understanding from the analysis which enable them to take immediate and effective actions to further reduce the severity of incidents on the roads.

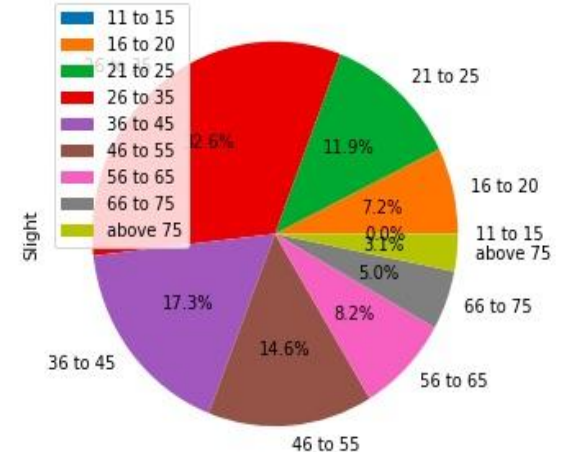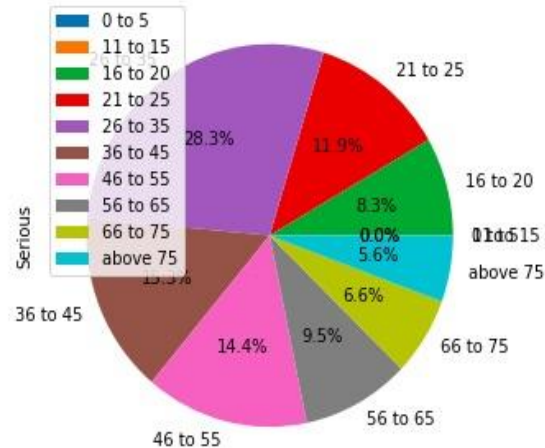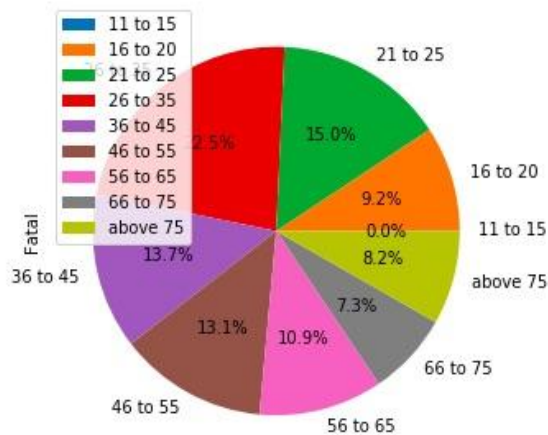- Insurance company could benefit from building a better pricing model.

Data Description

- The dataset can be found from Kaggle which was fetched from UK government open data sources and primarily captures road accidents in UK between 1979 and 2015 and has 70 features/columns with around 250,000 records.

- Cleaning the data, dropped less related features, remove the missing data with minimal percentage.
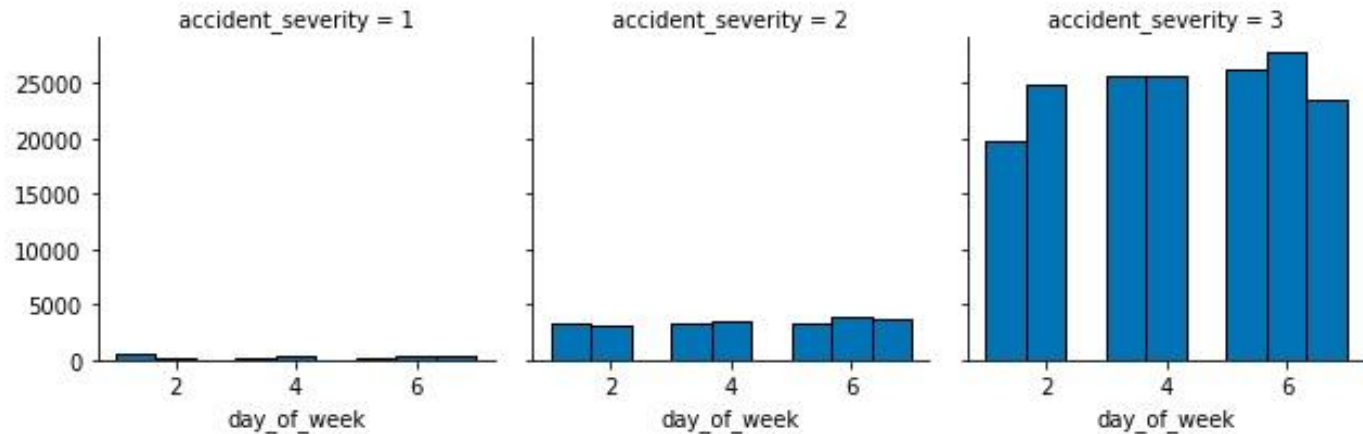
- Final data contains 8 features.

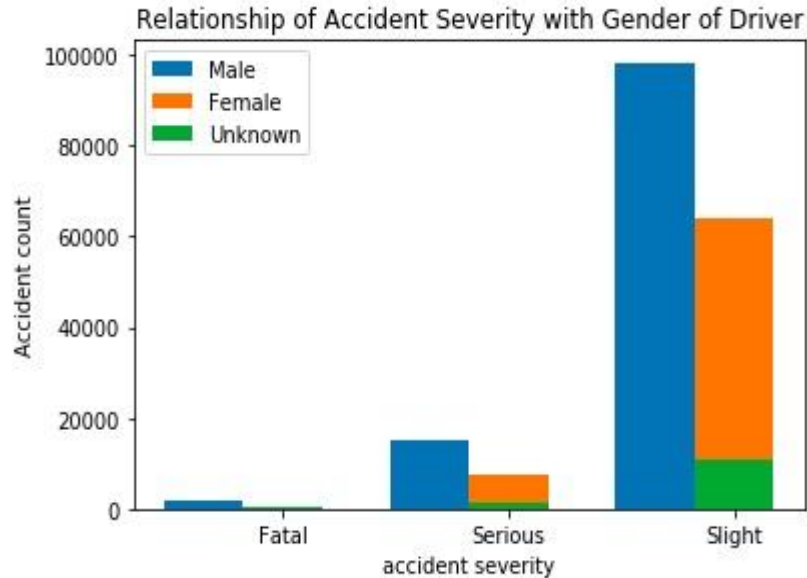# Relationship between severity of car accident and sex of drivers.

- The percentage of people aged 21 to 45 in the car accidents reduced when the accident severity level increased from Slight to Fatal, while drivers with age above 75 increased from 3.1% to 8.2%. This indicates that people over 75 are more likely to deliver serious accidents.

Relationship between severity of car accident and accident day of the week

No significant difference on the accident severity level between the days of the week, but weekend is relatively having more slight accidents comparing to Monday which has higher chance on fatal accidents.

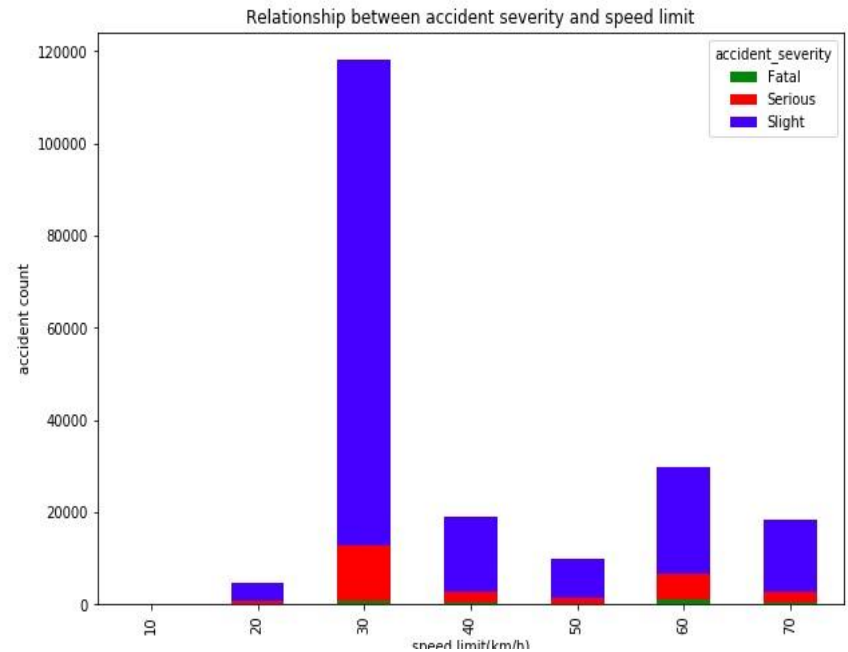Relationship of Accident Severity with Gender of Driver

Relationship between severity of car accident and sex of driver

With the increase of the accident severity level, the proportion of female driver is getting lesser.

Relationship between severity of car accident and speed limit

The majority of the accidents with limit 30km/h are slight.

When the speed limit is above 60km/h, the occurrence of fatal accidents has significantly increased.

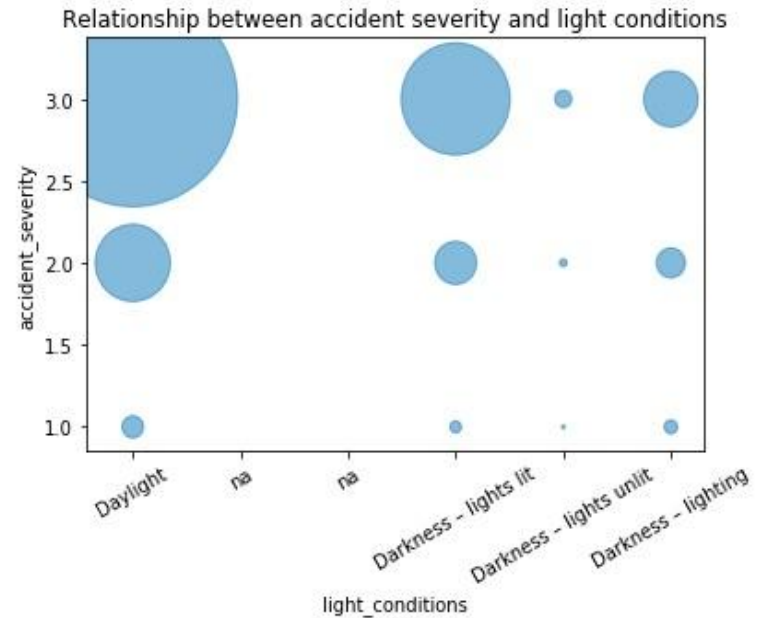Relationship between accident severity and speed limit

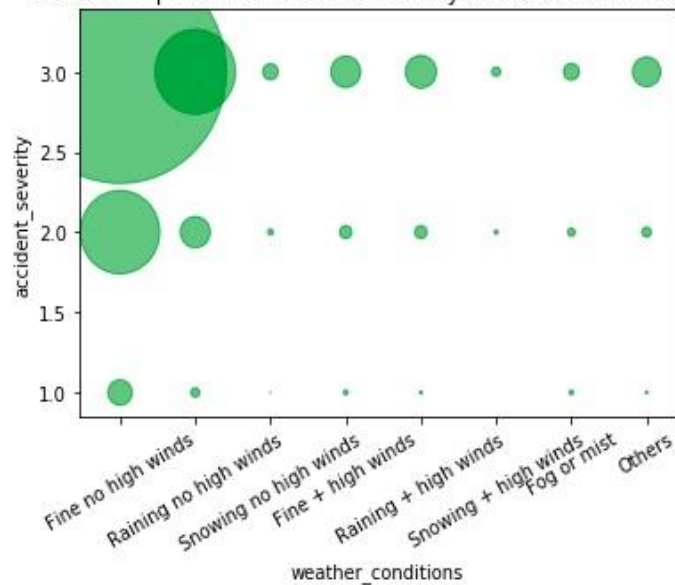# Relationship between severity of car accident and light conditions, weather conditions and road surface conditions

Accident severity tends to be more serious under darkness conditions.

When accident happened, if the weather is high winds, fog or mist, the severity is more likely to be fatal than good weather.
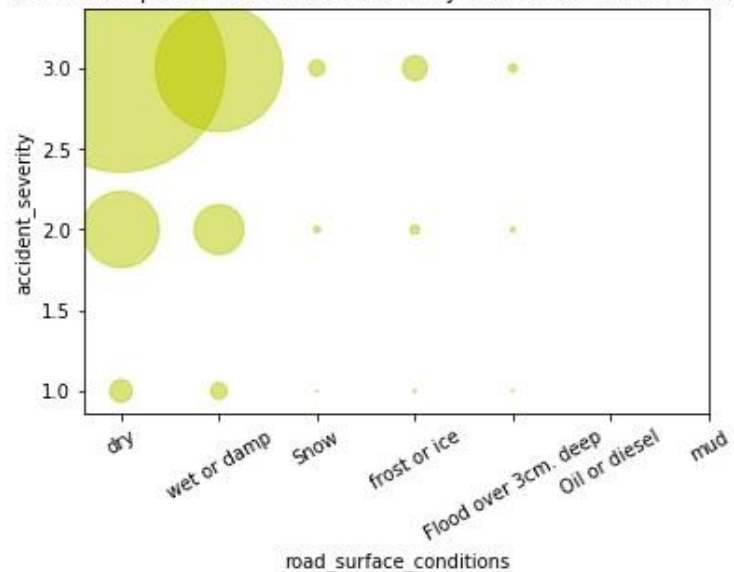
Dry surface seems to have a little bit higher proportion of slight accidents.

Relationship between accident severity and light conditions

Relationship between accident severity and weather conditions

Relationship between accident severity and road surface conditions

Classification Model

Accuracy: 80.6238% to 86.7375% between the 5 models

Best performance: Decision tree and Logistic regression

	K Nearest Neighbour	Decision Tree	Support Vector Machine	Logistic Regression
Accuracy	85.8329%	**86.7357%**	80.6238%	**86.7357%**

Discussion and Conclusion

- Data could be biased:
  - Insufficient information
  - Records are not mutually exclusive

- Providing insights for governments and insurance companies.
- Still room to improving the accuracy of model.