Data Driven Recommendations: Aviation Business

Overview

- We want to identify the aircraft that is associated with the lowest accident rates and has the highest safety record.
- In order to do that we need to assess factors like make, category, Engine types by the number of accidents.
- Our analysis will be done using historical data on aircraft accidents
- The source of the Analysis data is the National Transportation Safety Board
- we will come up with actionable insights for the company to select the safest aircraft and give effective risk management.

Technologies used

- pandas - for manipulation and analysis.
- numpy - for numerical operations and calculations.
- matplotlib - for interactive visuals.
- seaborn - Data visualizations

The analysis will cover the following features

- loading the aviation data set and getting the required information.
- Data cleaning.
- Exploratory data analysis(visualizations).

What the analysis will cover

- The model and make that is involved in least number of accidents/injuries
- The Engine number that is least involved
- The phases of flight that most accidents/injuries happen and the phase which least accidents/injuries happen
- The aircraft category involved in least number of accidents/injuries
- The weather conditions which least accidents/injuries happen

1. Loading dataset and getting the required information.

- Descriptive statistics – Mean, count, standard deviation, frequency, percentile, minimum and maximum.
- Statement of the problem
- Metrics of success

2. Data cleaning

- Dropping unnecessary columns
- Dropping duplicates
- Filling and dropping null values
- Removing outliers

3. Exploratory Data Analysis

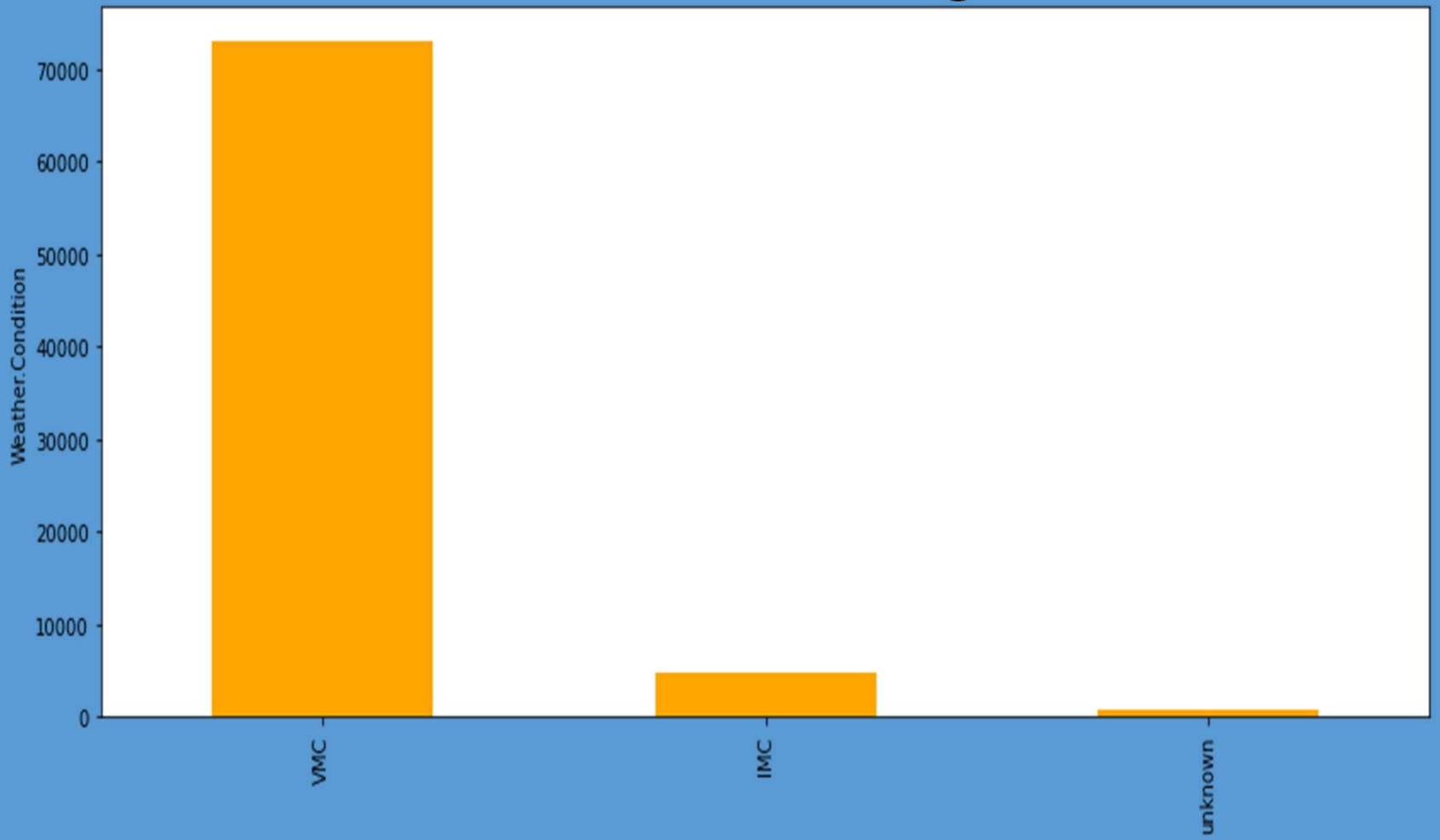
3.1 Univariate Analysis.

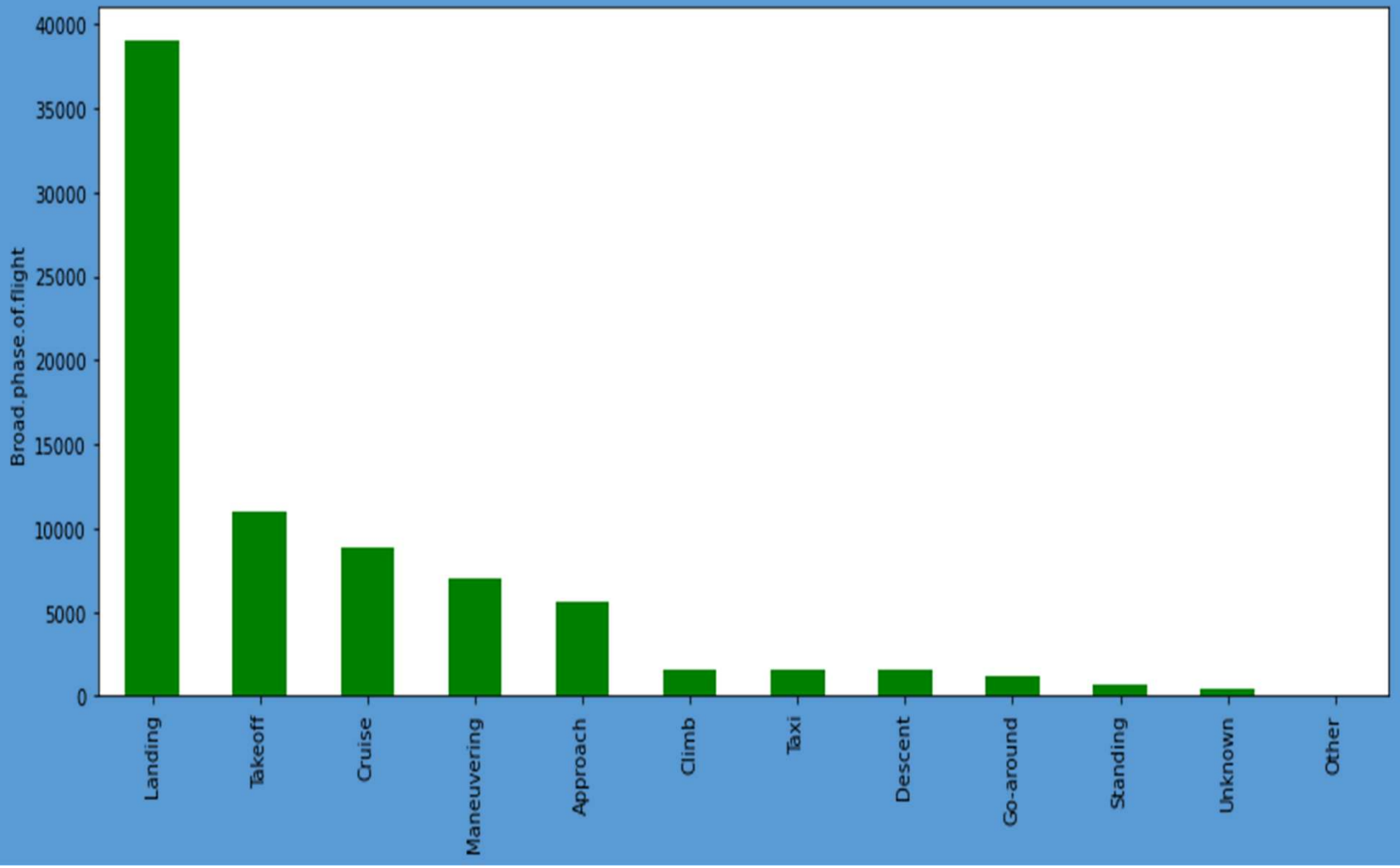
3.2 Bivariate.

3.3 Multivariate.

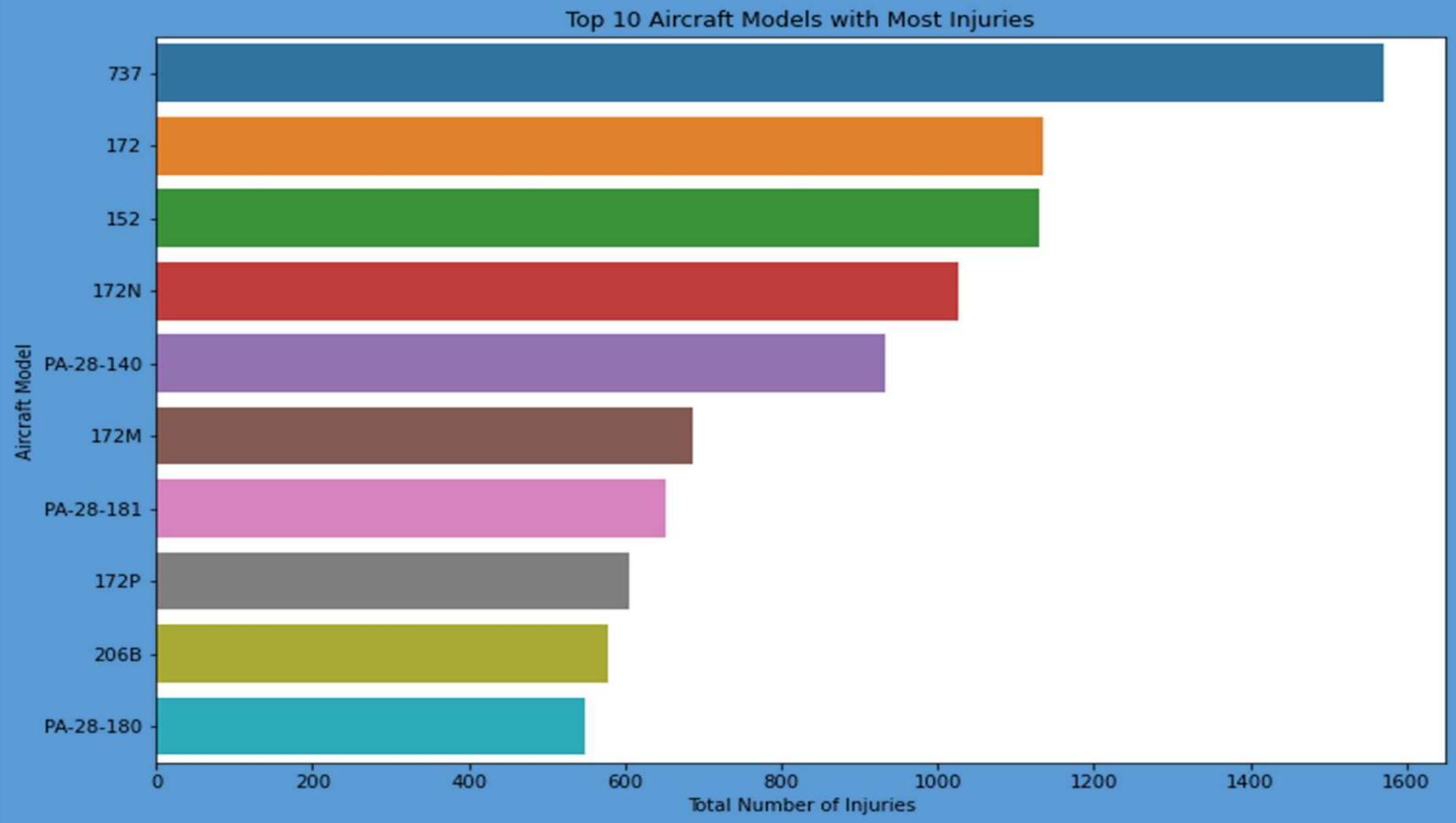
3.1 Univariate

Weather condition with the highest accident rates.

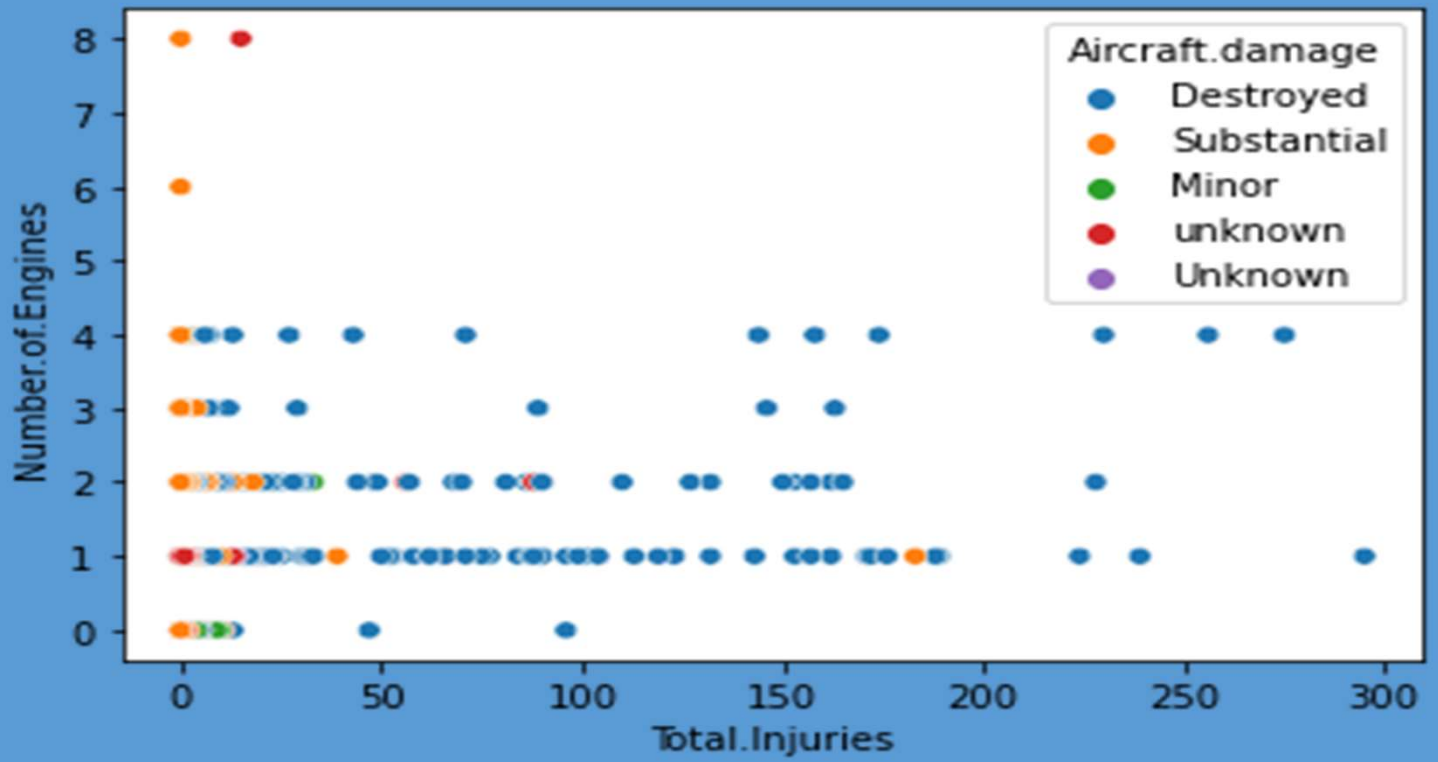


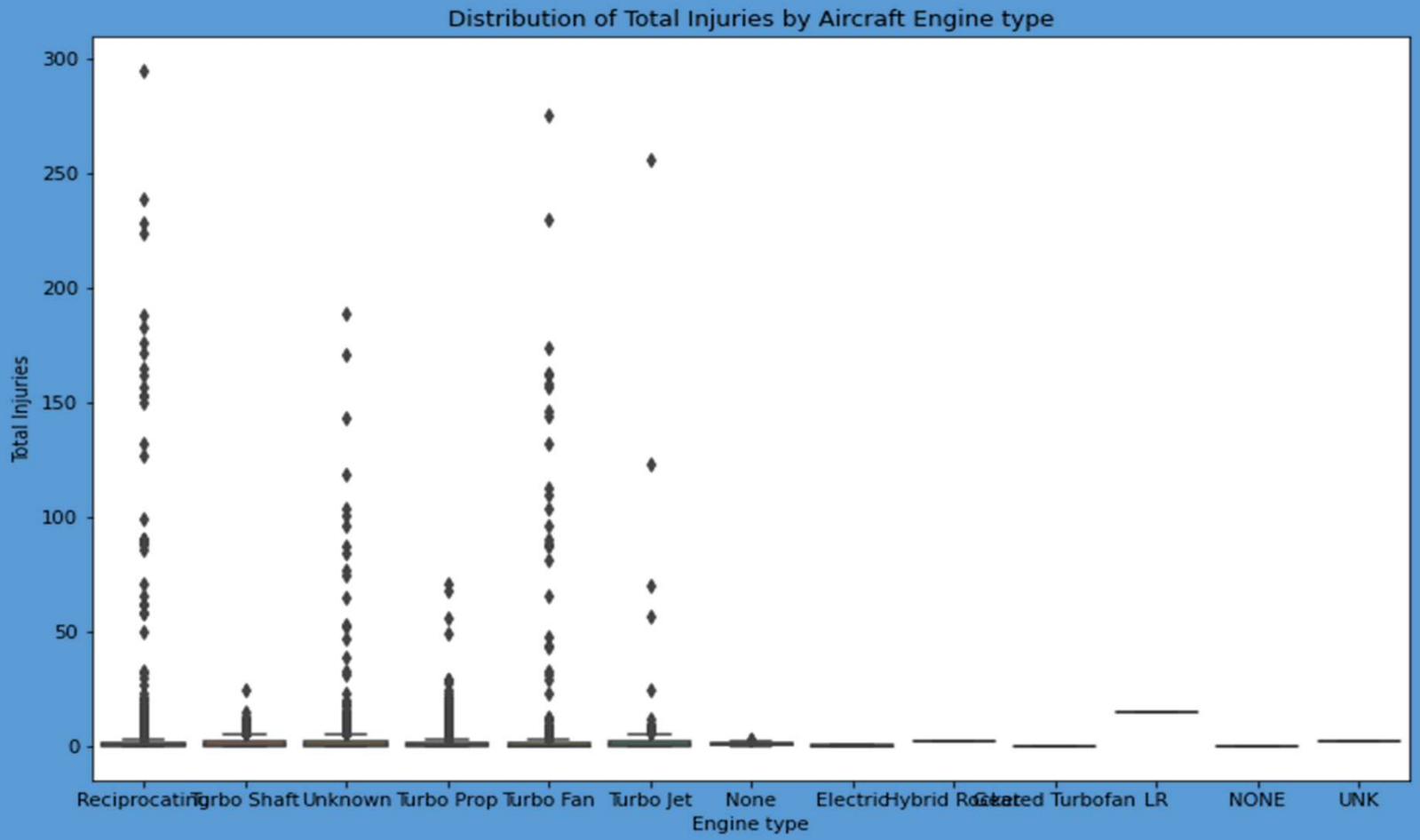

Broad.phase.of.flight
40000
35000
30000
25000
20000
15000
10000
5000
0
Landing
Takeoff
Cruise
Maneuvering
Approach
Climb
Taxi
Descent
Go-around
Standing
Unknown
Other

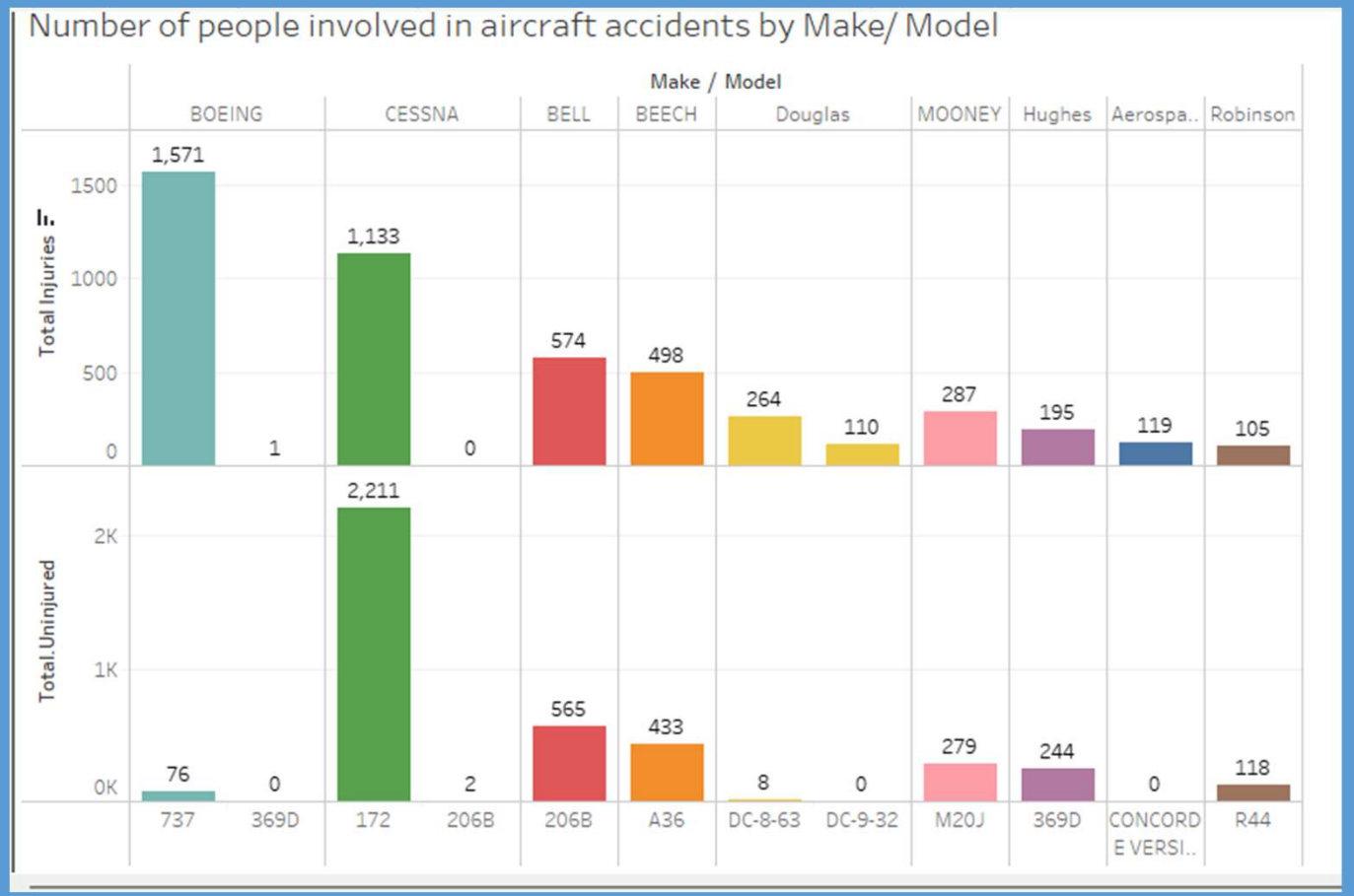
3.2 Bivariate



3.3 Multivariate




Distribution of Total Injuries by Aircraft Engine type
Total Injuries
300
250
200
150
100
50
0
Reciprocating
Turbo Shaft
Unknown
Turbo Prop
Turbo Fan
Turbo Jet
None
Electric
Hybrid Rocket
Geared Turbofan
LR
NONE
UNK
Engine type


Number of people involved in aircraft accidents by Make/ Model
Make / Model
BOEING
CESSNA
BELL
BEECH
Douglas
MOONEY
Hughes
Aerospa..
Robinson
Total Injuries
1,571
1
1,133
0
574
498
264
110
287
195
119
105
Total.Uninjured
76
0
2,211
2
565
433
8
0
279
244
0
118
737
369D
172
206B
206B
A36
DC-8-63
DC-9-32
M20J
369D
CONCORD E VERSI..
R44

Conclusions

- From the above analysis, we can be able to conclude that;
- Boeing 369D, and Cessna 206B are least involved in Accidents and injuries
- The least aircraft category involved in injury incidences is the powerd-Lift
- LR(Long range) Engine type carries the least number of injuries
- Amateur built aircrafts are safe as compared to other makes.

Recommendations

- Multi- engine aircrafts should be prioritized. As observed, aircrafts with fewer engines tend to cause most accidents and injury incidences as well
- LR(Long Range) engines should also be considered into the fleet. LR engines have shown to have caused the least number of injury incidences probably due to their reliability
- Power- Lift, Boeing 369D, and Cessna 206B should also be given the first priority as they have shown to cause less injury incidences
- If the company plans to include Cessna, safety measures and training of pilots on handling Cessna aircraft should be prioritized.
- Amateur built planes should be bought as they are least involved in accidents

THANK YOU!