Aviation Accidents Analysis

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Summary

- Company expansion to aviation industry
  - Purchasing Aircraft
- Data Analysis is done on Aviation Accident Dataset
  - Find out aircraft with minimize risk
- Data prepared and analysed
- Impact of Aircraft Make, Model, Engine type and number on:
  - number of accidents and
  - Total injuries caused
- Recommends factors to consider during purchase of Aircrafts

Outline

- Business Problem
- Data
- Methods
- Analysis and Results
- Conclusions

Business Problem

- The company expanding into the aviation industry
- This requires purchase of aircrafts
- Risk factors
  - Aviation accidents
- Factors to decrease the risk of aviation accidents ?
- Which type of aircraft to purchase to minimize risk and maximize profit.

Data

- Data source : The NTSB Aviation Accident Database - Kaggle website.
- Data from 1962 and later :
  - Civil aviation accidents and selected incidents
  - mainly within the United States
- Dataset with:
  - 88,889 rows or entries
  - 31 columns or variables
- Data on - Aircrafts involved in accidents and incidents:
  - Aircraft Make and Model
  - Type and number of engine
  - Damage to Aircraft and Injuries caused

Methods

Data Preparation

- Dropped columns:
  - unnecessary columns &
  - with lots of missing values
- Replacing null values with:
  - Median(for numerical columns)
  - Most common values (categorical columns)
  - ‘Unknown’ values (for some categorical columns)
- Dropped some rows with null values
- Added new columns - “total_injuries”

Analysis and Result

Data Analysis involved:

- Number of Accidents and Total injuries in relation to Aircrafts' :
  - Make and Model
  - Type and Number of Engines
  - Combination of the above factors
- Data visuals are used.

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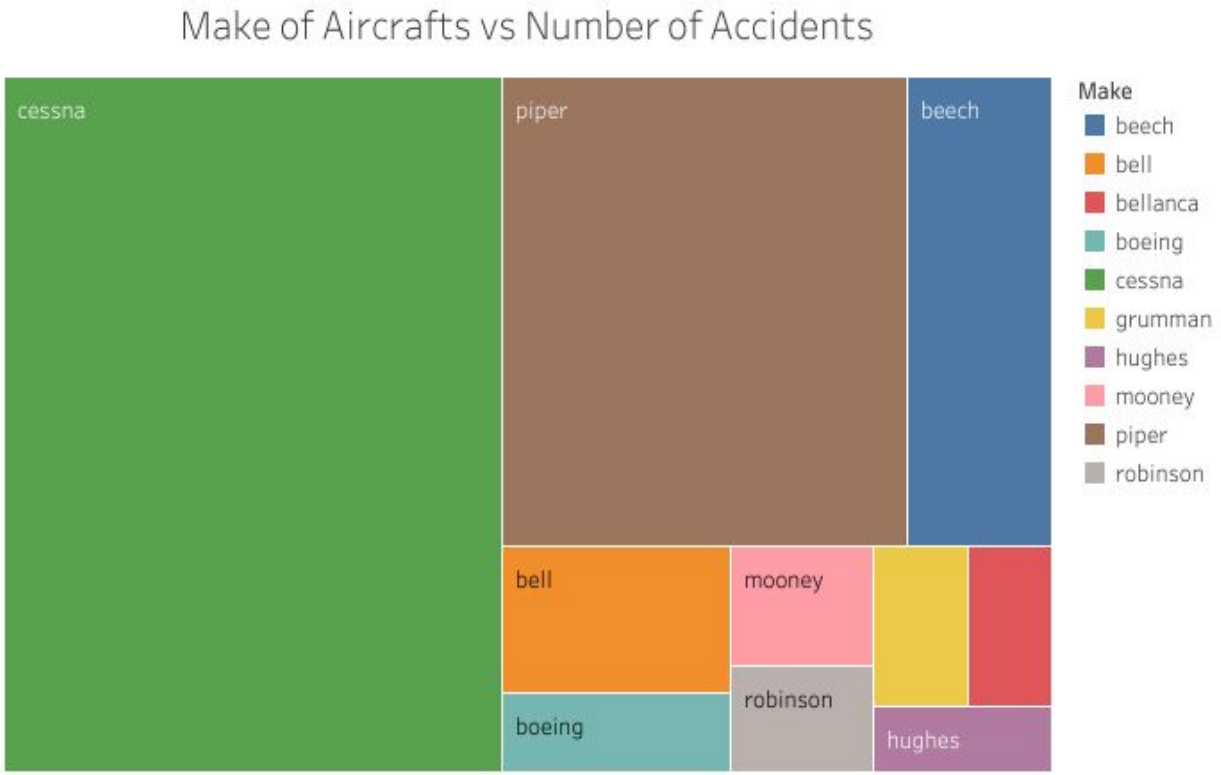

- Some Aircraft Make are involved more on accident than others

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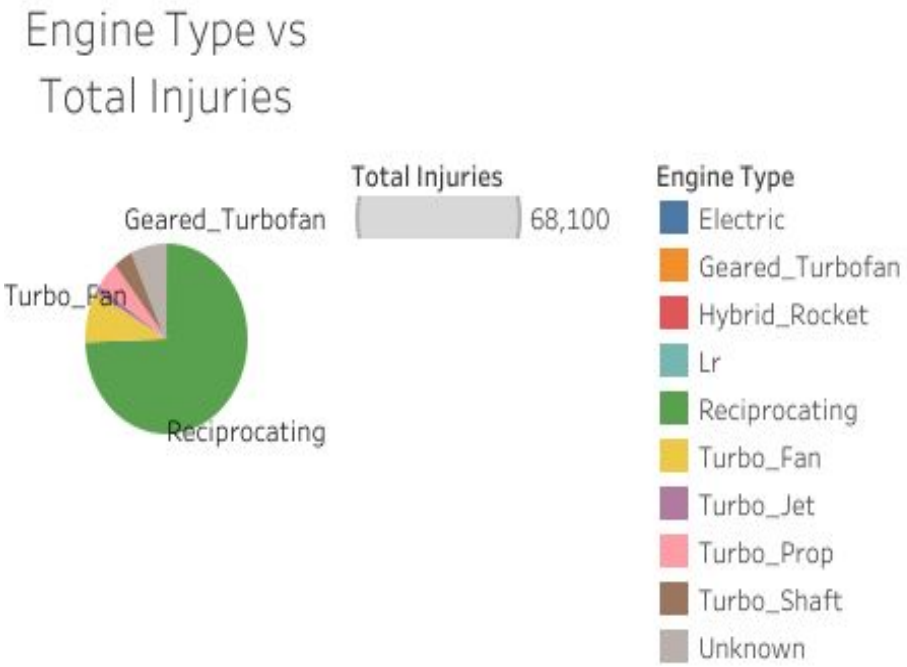
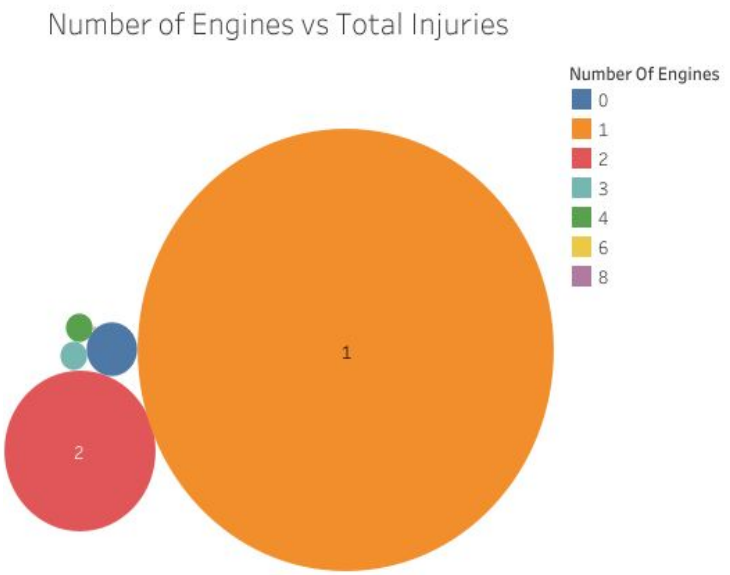

Engine Type vs Total Injuries
Total Injuries
68,100
Geared_Turbofan
Turbo_Fan
Reciprocating
Engine Type
Electric
Geared_Turbofan
Hybrid_Rocket
Lr
Reciprocating
Turbo_Fan
Turbo_Jet
Turbo_Prop
Turbo_Shaft
Unknown


Number of Engines vs Total Injuries
Number Of Engines
0
1
2
3
4
6
8
1
2

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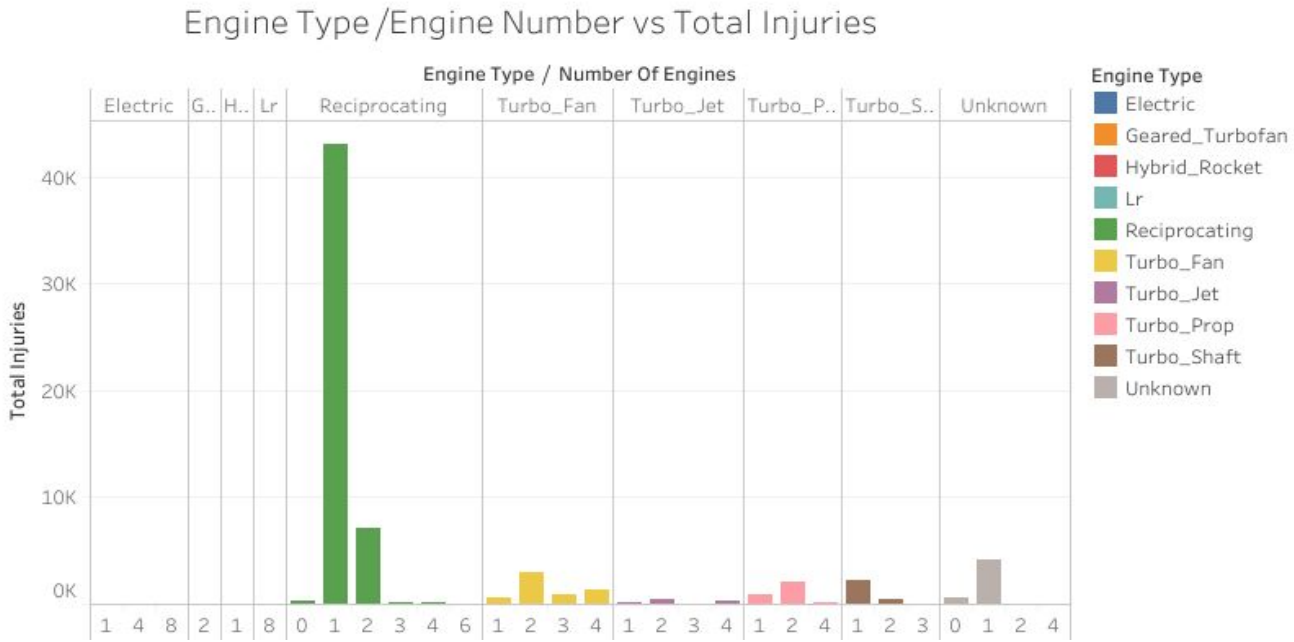

- Highest records of accidents and injuries:
  - Engine types(e.g Reciprocating)
  - Number of engines(e.g 1 engine)

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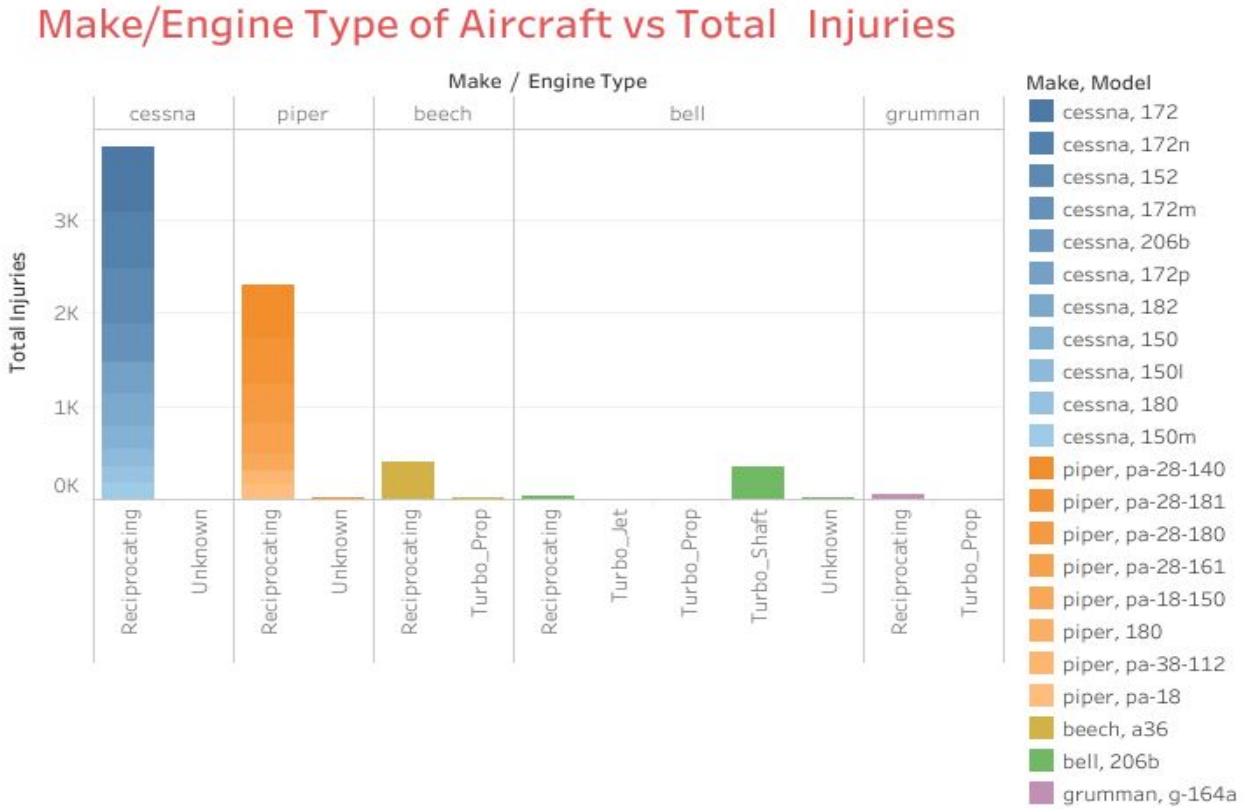

- Cessna Make and Reciprocating engine - highest records

Conclusions

- Consider buying aircrafts with:
  - large number of engines
  - engines types with lowest accidents recorded.
- Avoid engine types:
  - with highest accidents recorded (e.g Reciprocating)
- Make and Models must be highly regarded during aircraft purchase
- Avoid Make and Models with highest accident records:
  - E.g Make - Cessna Models - 152 and 172

Thank You!