Aircraft Risk Analysis

Business Overview

- The company is entering the aviation industry but lacks expertise in aircraft safety.
- This analysis helps the **Head of the New Aviation Division** make informed, low-risk aircraft purchasing decisions.

Data Understanding

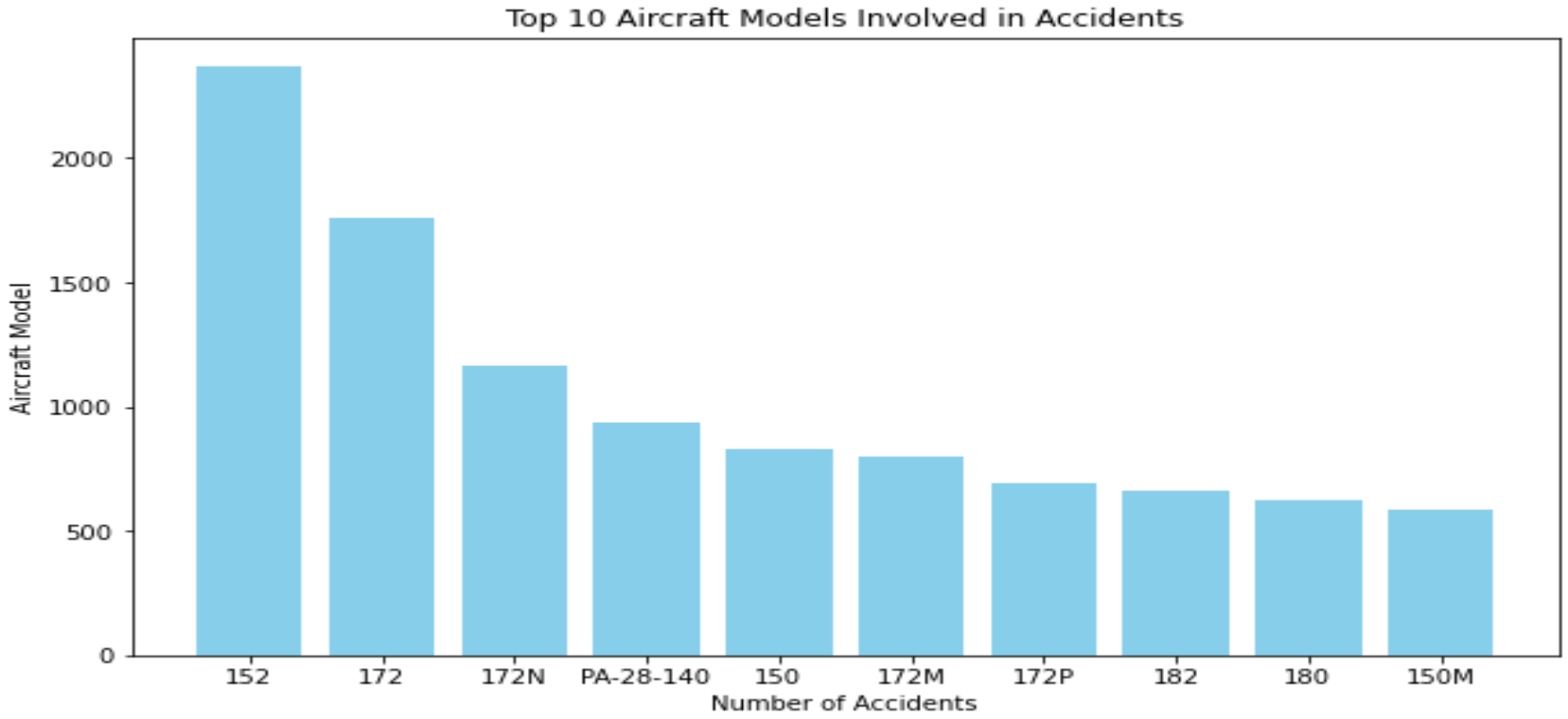
The dataset contains historical records of aviation incidents and accidents including:

- Operational context (Purpose of Flight, Number of Engines)
- Incident characteristics (Injury Severity, Damage, Weather Conditions)
- Aircraft information (Make, Model, Engine Type)

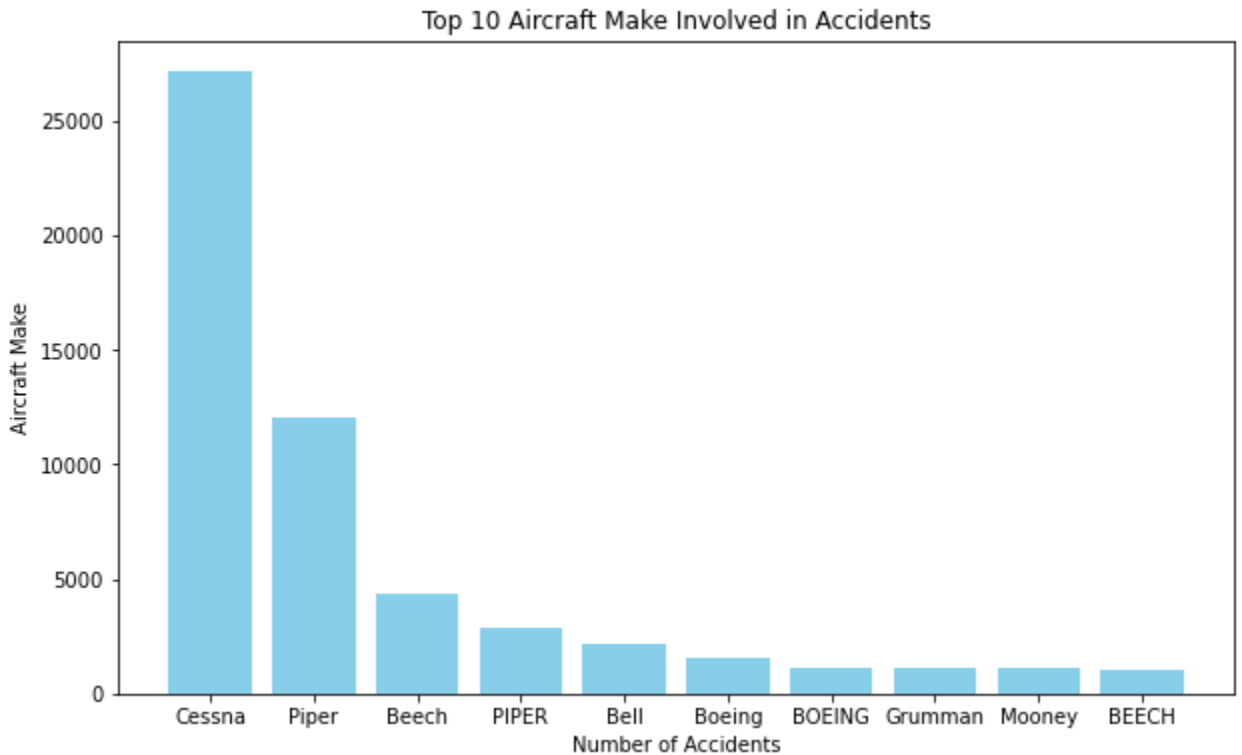
Data Process steps

- Loaded the dataset and installed the necessary libraries into Jupyter notebook
- Looked at the overall shape and structure of the dataset.
- Cleaned the dataset on a copy of the dataset which involved:
  - Removing duplicates
  - Handling missing values
  - Ensuring consistency across relevant variables
- Performed my EDA.

Top 10 Aircraft models and makes Involved in Accidents.

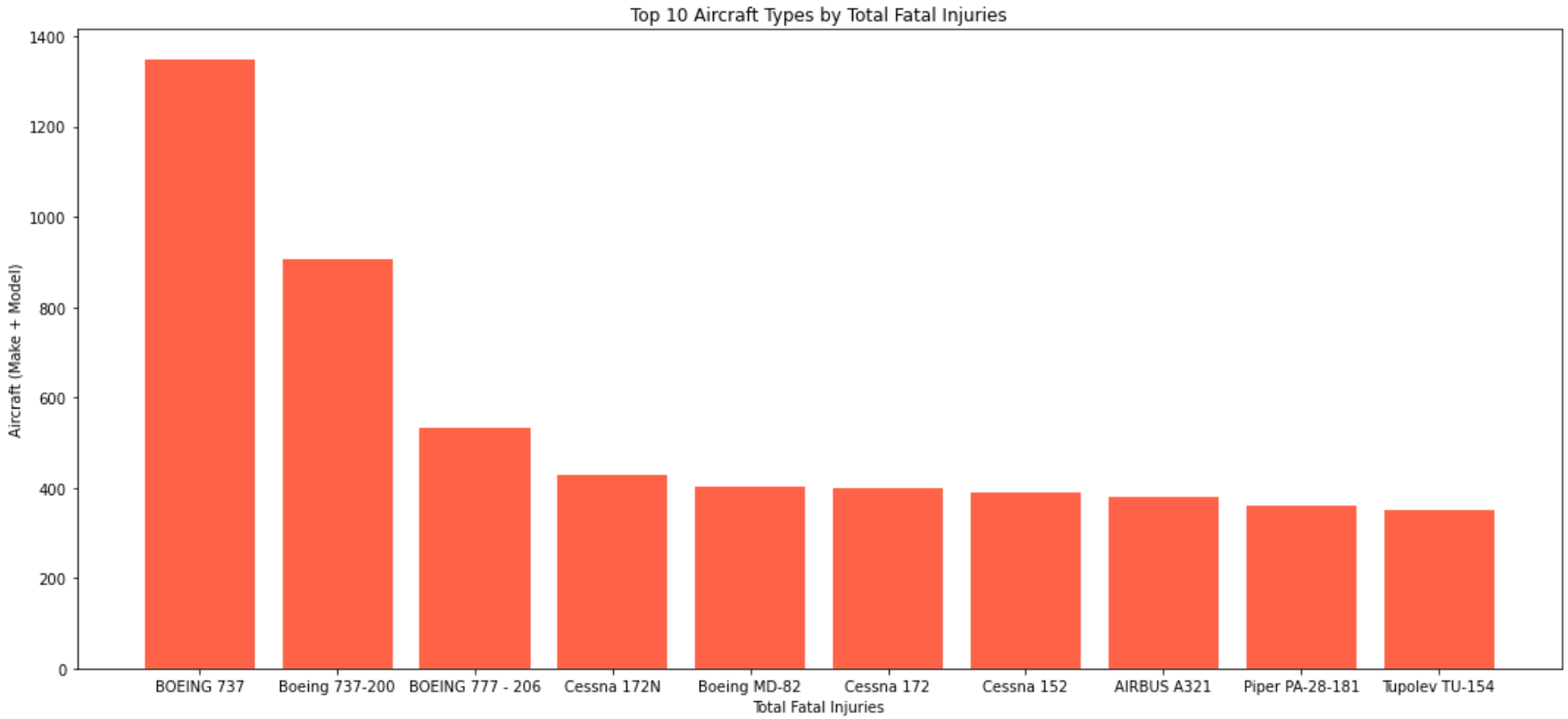


The bar chart above shows that the first 3 aircrafts models have the highest number of accidents.



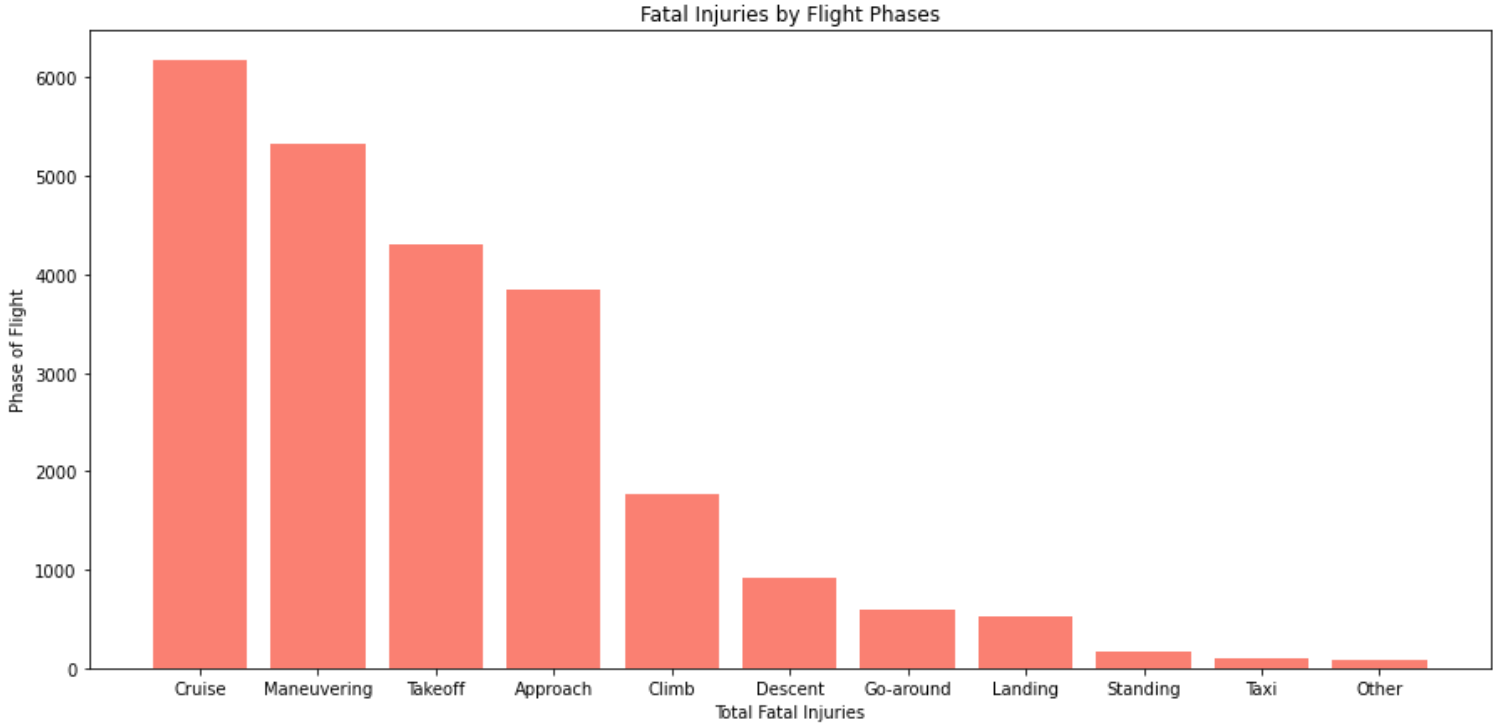
The bar chart shows that one aircraft manufacturer (Cessna) is involved in accidents far more frequently than others.

Top 10 Deadliest Aircraft Models and Make



The bar chart above shows the specific aircraft models have been associated with the highest total fatalities in accidents.

Most dangerous flight phases



The bar chart shows that certain phases – particularly Cruise, Maneuvering, Takeoff and Approach – account for the majority of fatal injuries.

Recommendations

- Prioritize deeper safety analysis on the top 3 manufactures which are Cessna, Piper and Beech.
- Conduct safety audits specifically on the top 10 aircraft types identified involved in fatal accidents
- Implementation of advanced in-flight monitoring systems to detect and address anomalies early during cruises.
- Focus on investigating spike years (2015, 2018) to identify root causes and apply targeted safety measures to ensure a more consistent decline in fatal accidents.

Future questions to explore

- Which countries have the highest number of accidents?
- What is the most common purpose of flight when accidents occur?

Thank you!

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