Aviation Accident Analysis

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Overview

- This project reviews data from the NTSB aviation accident database contains information from 1962 up to 2023 about civil aviation accidents and selected incidents within the United States, its territories and possessions, and in international waters.
- As the company expands into new industries, it acknowledges the crucial need to assess and manage the risks linked to aircraft operations. Although the aviation sector is profitable, it involves inherent risks that require careful analysis to ensure well-informed purchasing decisions.

Understanding the problem

- Embarking on a high-flying adventure in the world of aviation! As we venture into the aviation industry it’s crucial to understand the landscape of airline safety.
- We’re conducting an in depth analysis of aircraft accidents. This will guide our strategic decisions ensuring safety remains our top priority as we expand into this new domain.

Business Understanding

- The company seeks to broaden it’s portfolio by venturing into the aviation sector, intending to acquire and manage aircraft for both commercial and private uses.
- The objective is to pinpoint the aircraft that carry the most risks, thereby ensuring safety through the actions to be taken and reducing potential liabilities. This information will guide the purchasing decisions for the new aviation division, focusing on safety reliability.

Understanding of the data

The dataset includes temporal data with incident dates and information on accident identification from National Transportation Safety Board(NTSB) available on Kaggle up to ‘2023’ such as distinct event identifies and inquire kinds.

There is location information available, including precise locations and Countries of occurrence, nevertheless there is up to 40% missing data in certain variables.

Analysis method

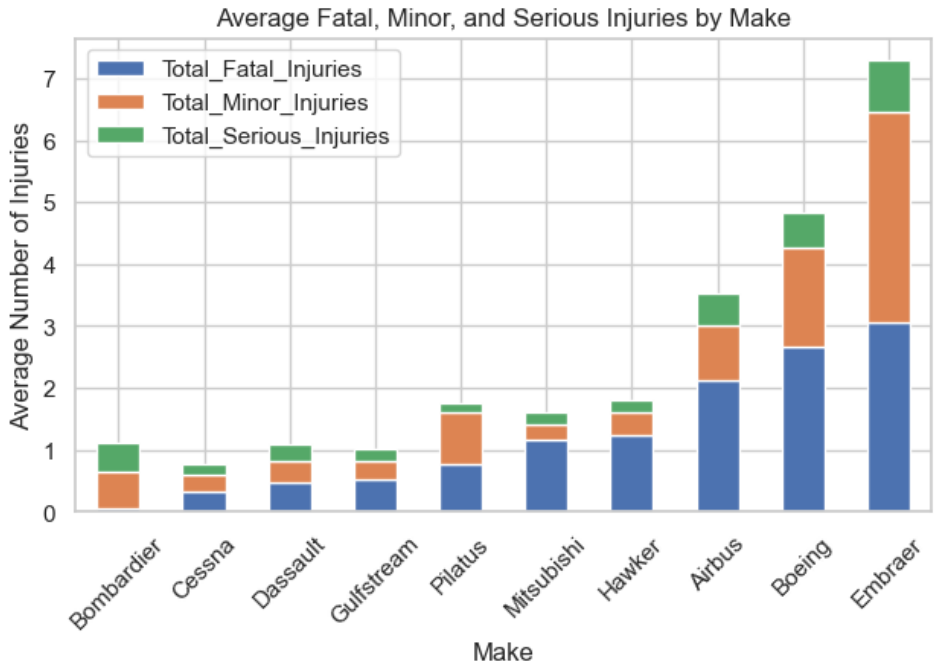
- Narrowed down to the following 10 manufacturers from 89,000 NTSB accident records:
  I. Boeing
  II. Airbus
  III. Bombardier
  IV. Embraer
  V. Dassault
  VI. Gulfstream
  VII. Cessna
  VIII. Pilatus
  IX. Hawker
  X. Mitsubishi

Measurement of safety

- Average fatal, minor and serious injuries
- Uninjured rate
- Fatality Rate
- Number of occurrences of incidences/accidents

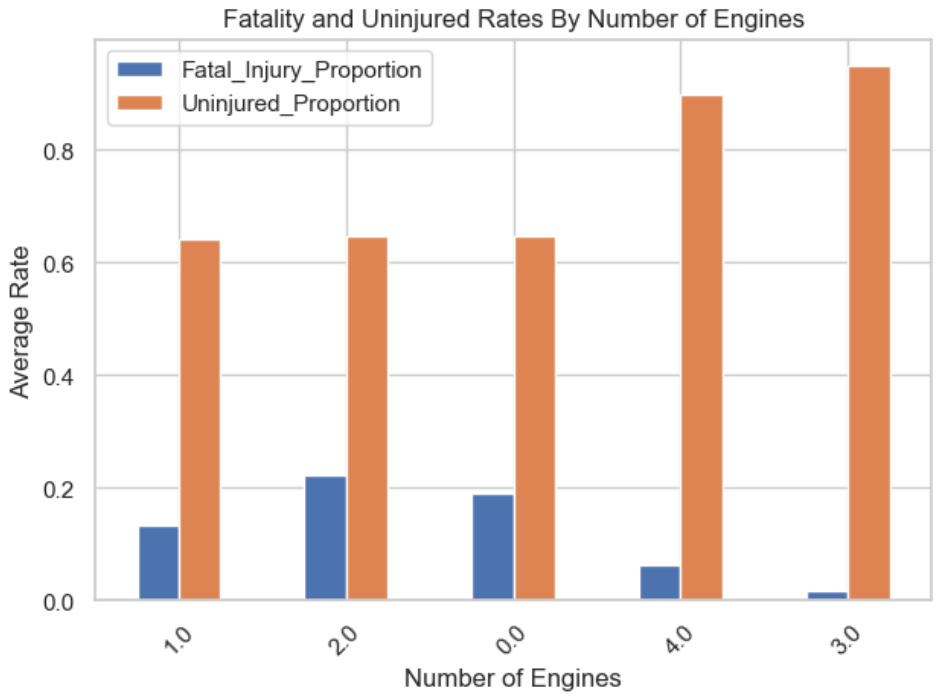
Analysis by make

- The plotting shows that the Bombardier is the top Aircraft manufacturer with the least average number of total injuries .Embraer has the highest average number of minor, serious, and fatal injuries, probably due to it’s popularity.



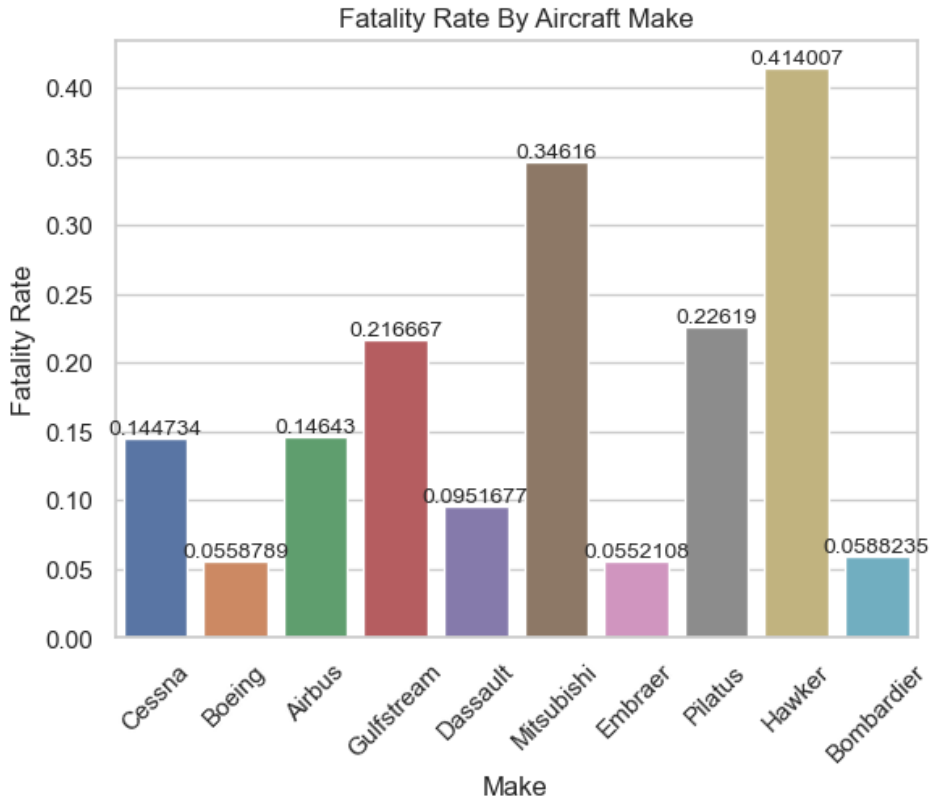
Fatality and Uninjured Rates By Number of Engines.

- This plotting shows that Aircrafts with 3 engines hold both the highest uninjured rate and the lowest rate followed by aircrafts with 4 engines.
- Aircraft with 2 engines, 1 engine and 0 engines(gliders) have approximately the same uninjured rate.
- Aircraft with 2 engines have the highest fatality rate.



Fatality rate by Aircraft Make

- Hawker has the highest fatality rate while Embraer has the lowest.



Recommendations

- Embraer A320 – Commercial use
- Bombardier CL 600- private Division

Next steps

- How many planes should we purchase
- What routes and schedule will ensure significant profit.
- Consider cabinet configuration options to enable customizations.
- Resale value
- Delivery timeline

THANK YOU

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