



Aviation Data Analysis



Overview

This presentation will show the viability of purchasing and operating aircraft for private and commercial enterprises. Using data acquired from the National Transportation Safety Board (NTSB), we will explore information pertaining to several airplane incidents and assess the risk of various aircraft.

Business Understanding

Our company aims to expand into the aircraft private and commercial sectors in the aviation industry. We also seek to assess the potential risk in venturing into these industries from an analysis of incidents and crashes from 1962 to 2023 provided by NTSB.

From this, we have an assessment of the risk and other contributing factors when considering which aircraft are suitable for our needs. This will be based on the frequency of crashed aircraft as per various metrics, the size of the aircraft deduced from fatalities and the trend of the fatalities by year.

Using this data I will propose recommendations that would be ideal in the initial purchases made in our expansion into the aviation industry.

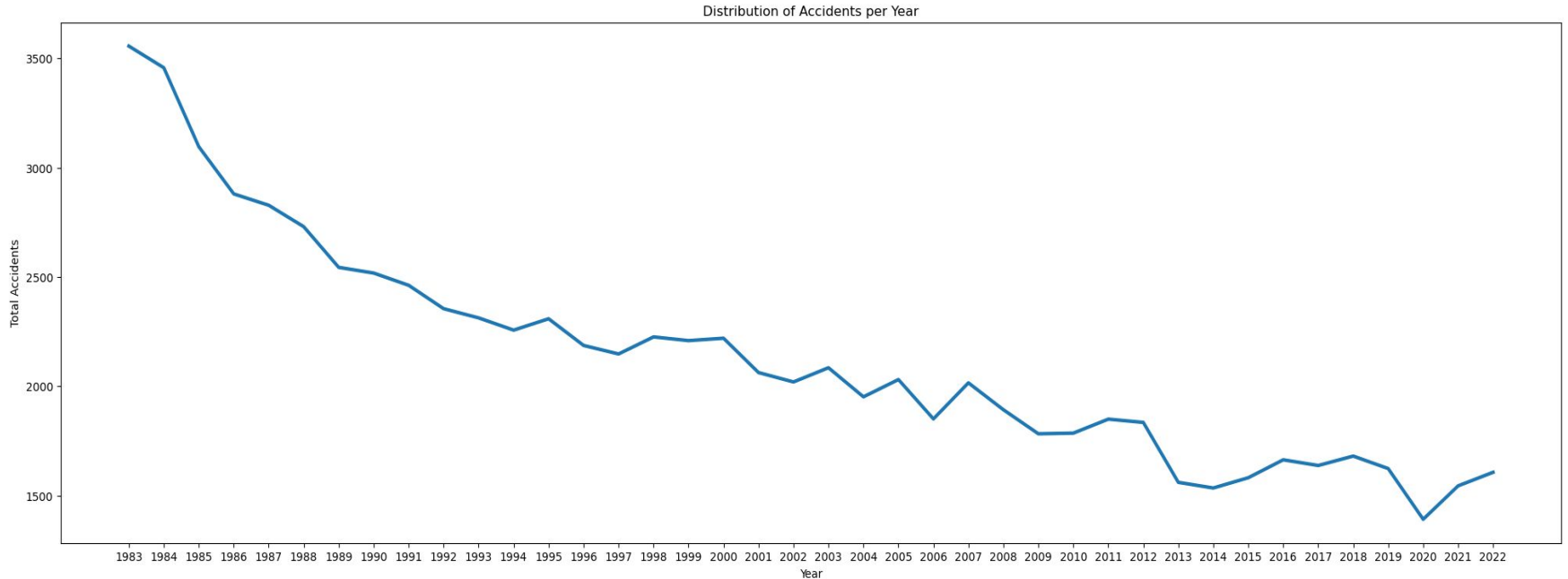
Data Understanding

The dataset used is sourced from NTSB (Aviation_Data) which contains records of civil aviation accidents and selected incidents occurred within the United States, its territories and possessions, and in international waters from 1962 to 2023.

The records detail the severity, number of injuries, amount of damage to the aircraft, make and model of the aircraft, location and date of each incident. Other information is provided such as the purpose of flight ,number of engines and weather conditions, which help inform the conditions of each accident or incident.

Data Analysis

The data shows there has been a decline in the total number of accidents per year. As seen in the line graph below.

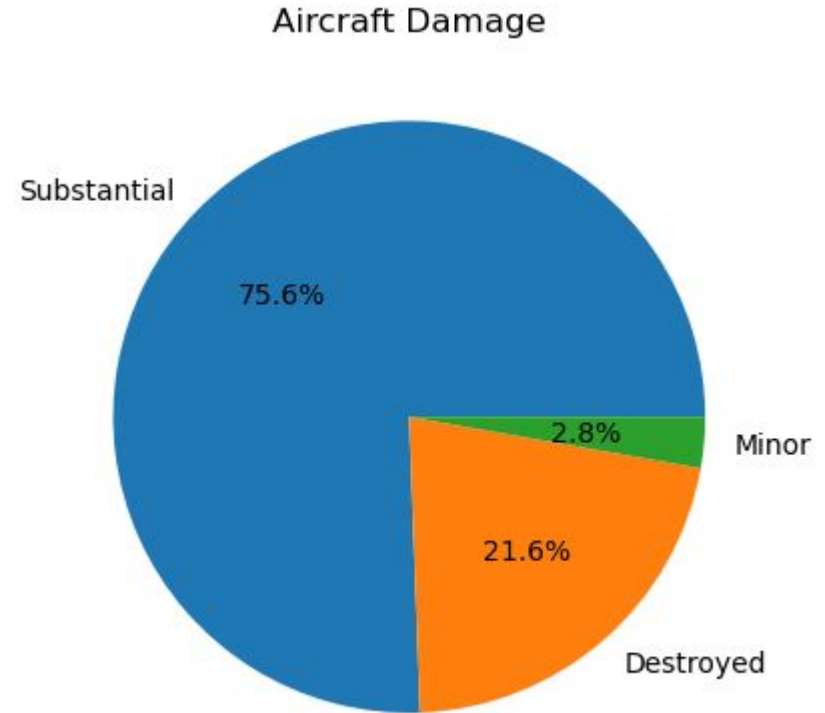


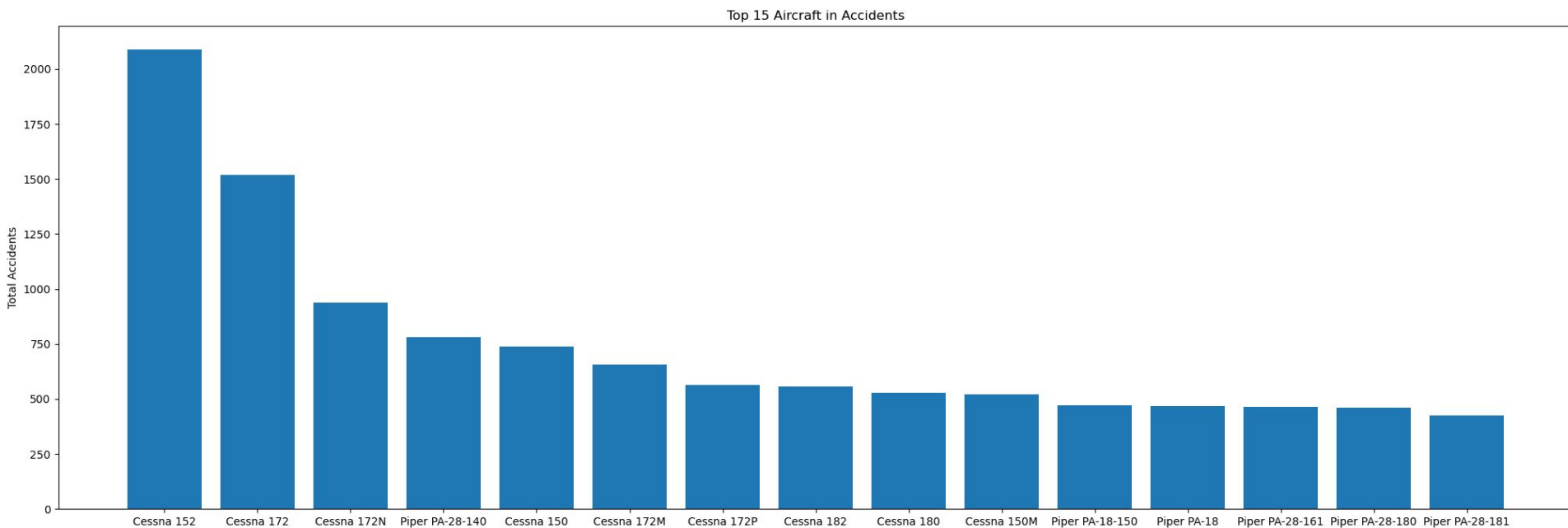
This bodes well for anyone pursuing to expand into the aviation industry this indicates aircraft have been getting progressively safer.

Advances in technology and better training play a key role in this. Increasing regulations and oversight also attribute to the prevention of systemic mistakes and errors made in the industry.

When aircraft do crash, there is a slim chance that the airplane would take minor damage.

This pie chart shows there is a 97.2% chance that the aircraft would take severe damage in an accident.



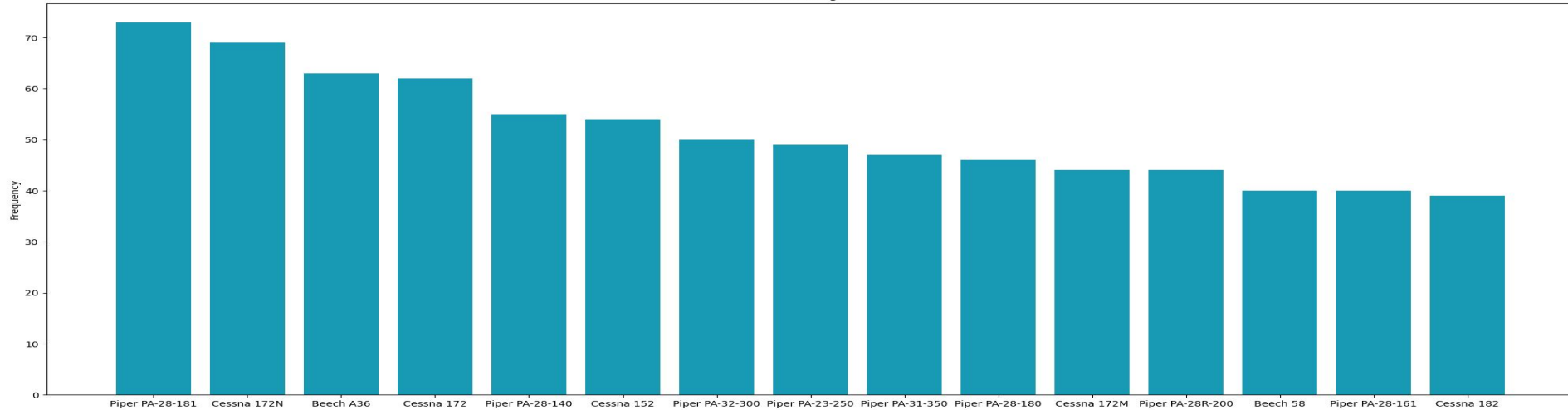


Smaller one engine aircraft populate the top 15 aircraft in total accidents. Although some of these aircraft are incredibly popular there is a shocking number of accidents between the Cessna 152 and Cessna 172 airplanes.

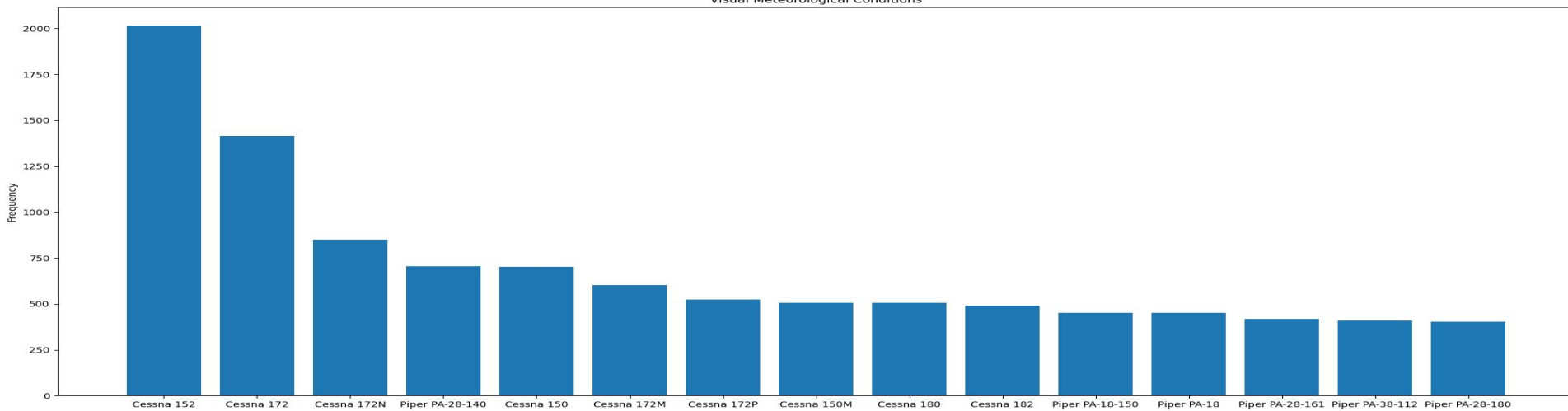
The weather conditions drastically increase the chances of an accident. The following plot will show how in two instances whereby the pilots had to rely on readings from their instruments: Instrument Meteorological Conditions and instances where the pilot had better visibility: Visual Meteorological Conditions, and how they impacted the total number of accidents in various aircraft models.

This information was gathered by aggregating the instances of airplane accidents and grouping the data by weather conditions.

Instrument Meteorological Conditions



Visual Meteorological Conditions



Recommendations

Based on these findings an assumption could be made, that when purchasing aircraft it would be prudent to:

- Pursue medium to large aircraft as there are relatively fewer incidents where they crash.
- Ensure the pilots and crew are well trained.
- Acquire aircraft with state of the art instrumentation and technology.

I believe these recommendations would help mitigate the risk of heavy losses and casualties in any instance where accidents may occur.

Next Steps

A more in-depth analysis would be required to assess potential aircraft for acquisition. Gaining insight to the fuel-economy, lifespan, maintenance costs and various other metrics would better serve to inform a decision on which aircraft to purchase for our fleet.

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