DATA-DRIVEN AIRCRAFT ACCIDENT ANALYSIS

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OVERVIEW

- The company is expanding into the aviation industry but lacks insights into the risks associated with different aircraft.
- To ensure a safe and profitable entry into this industry, we need to identify the lowest-risk aircraft models for commercial and private operations.
- This analysis examines historical accident data, focusing on aircraft make and model, engine type, and flight purpose to identify trends in safety and risk.
- The findings will provide data-driven recommendations to guide in decisions making and minimize operational risks.

Business Understanding

1. The company is expanding into the aviation industry and wants to acquire aircrafts.

2. The focus of the analysis is to determine which **aircraft models** are **safest** for commercial and private use.

3. Decision-makers require **clear,** and **data-backed insights** to minimize risk and optimize investment.

Key Business Objectives

- **Determine which aircraft models have the lowest accident rates.**
- **Identify key risk factors such weather, flight phase, aircraft manufacturer.**
- **Provide three concrete business recommendations to guide aircraft purchase decisions.**

Data Understanding

A deeper dive into understanding the data

Data Understanding

Dataset Insight

The dataset consists of **88,889** rows and **31** columns.

Data was cleaned to ensure that all missing values are dealt with.

Key Variables Analyzed:

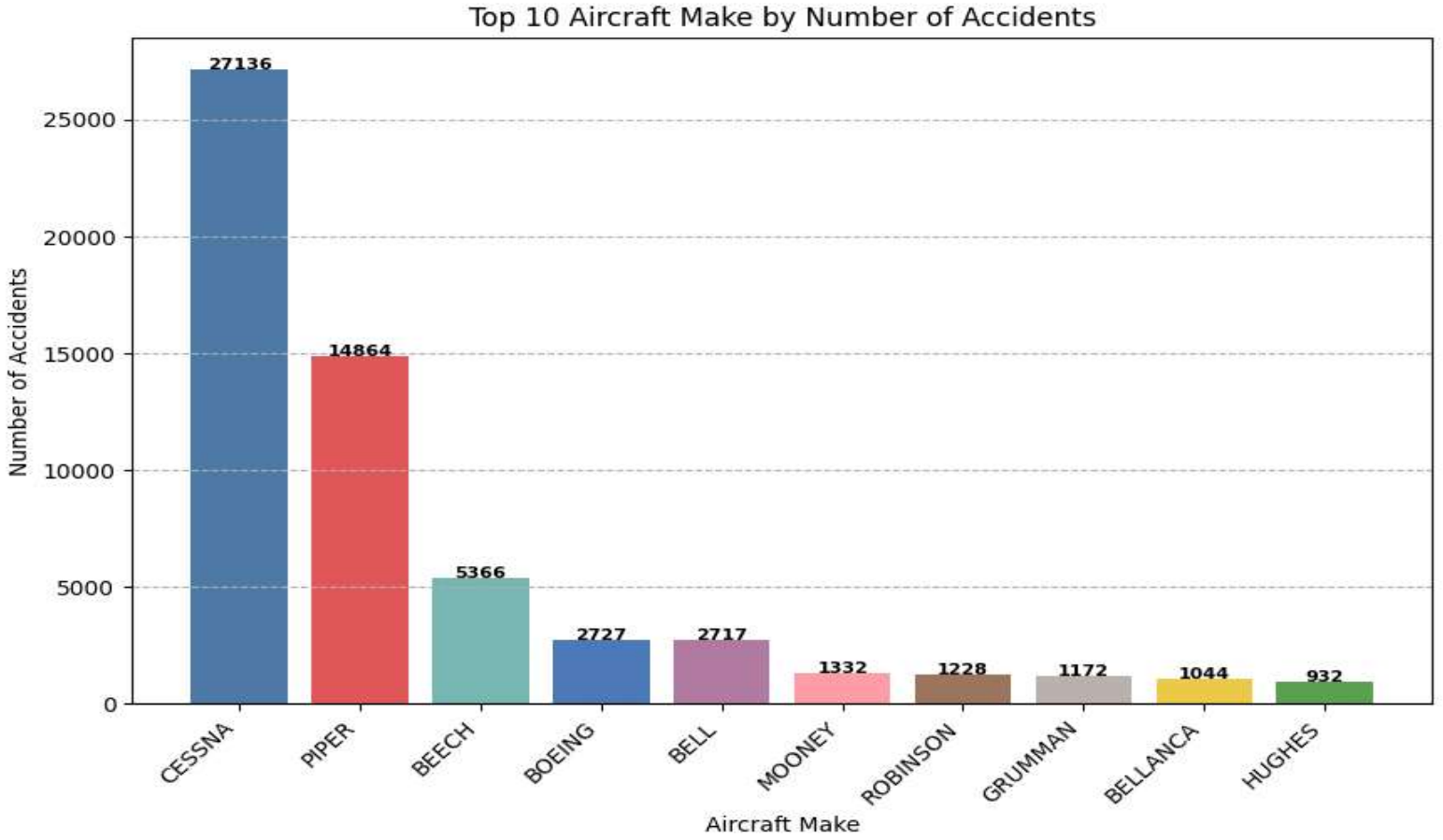
- **Aircraft Make & Model** - safety
- **Engine Type –** Reliability
- **Number of Engines –** Reliability
- **Purpose of Flight** - risk levels

Data Source: Aviation Accident Database & Synopses up to 2023

Data Analysis

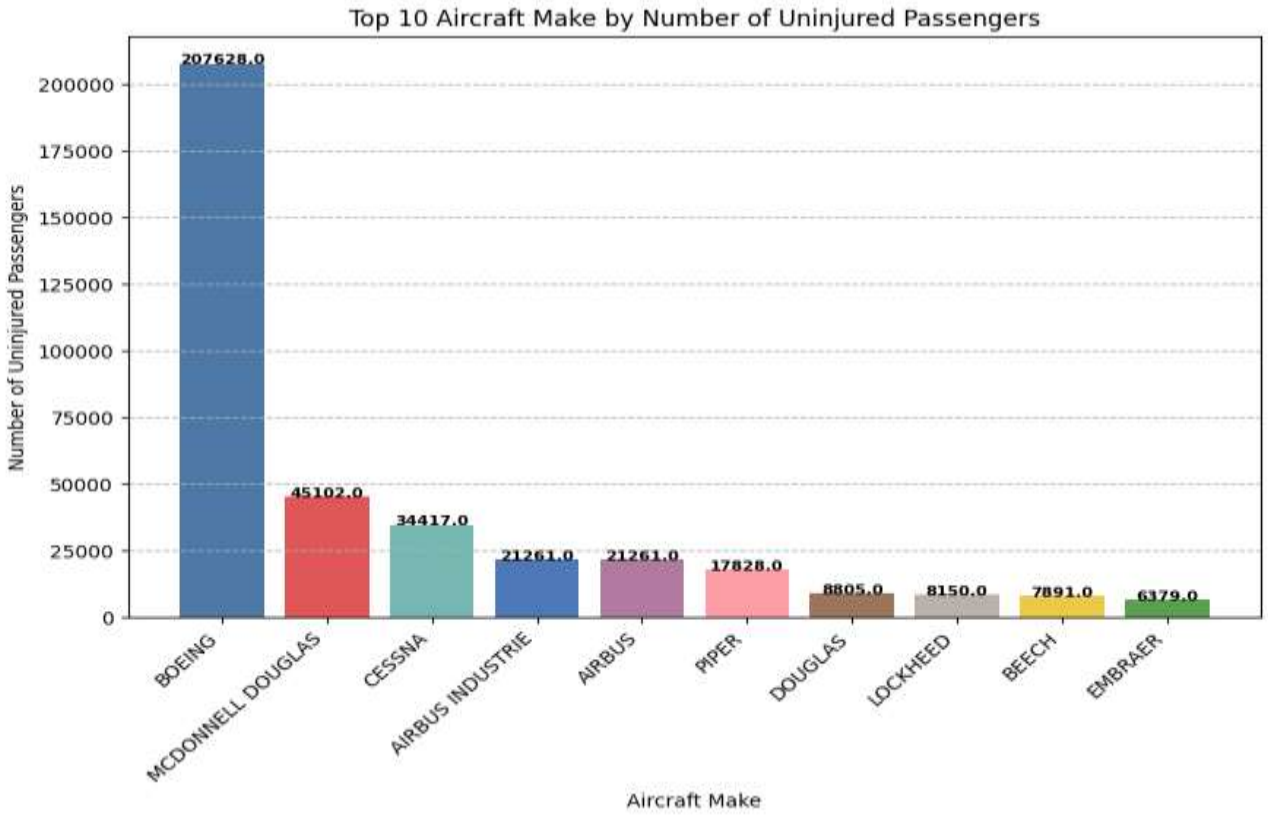
Deeper understanding of the data

Make such as **CESSNA** and **PIPER** have high number of accidents reported.



Make Analysis by Number of Accidents

Uninjured Passengers by Make

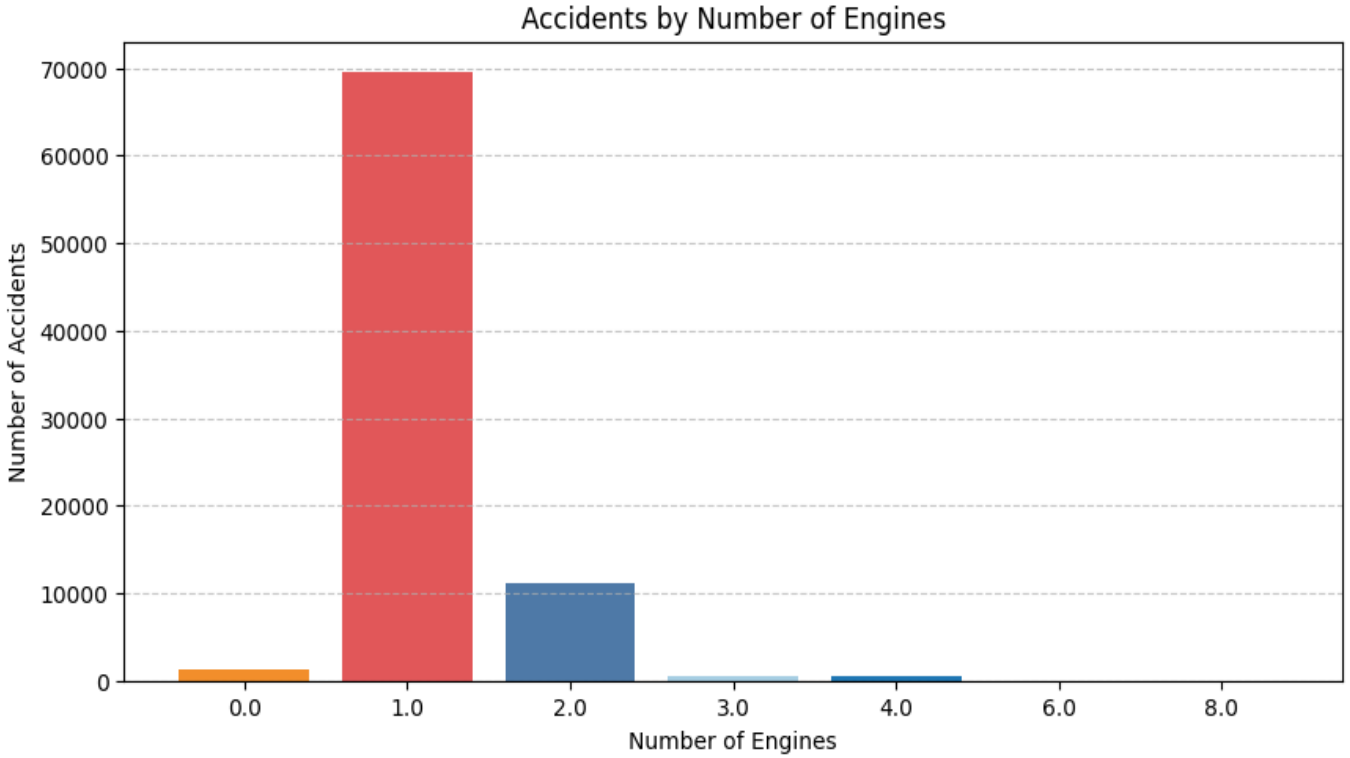


- Despite **BOEING** being involved in several of accidents, the number of uninjured passengers is very high
- **CESSNA** having been involved in the most accidents from the above analysis, the number of uninjured passengers is quite low.

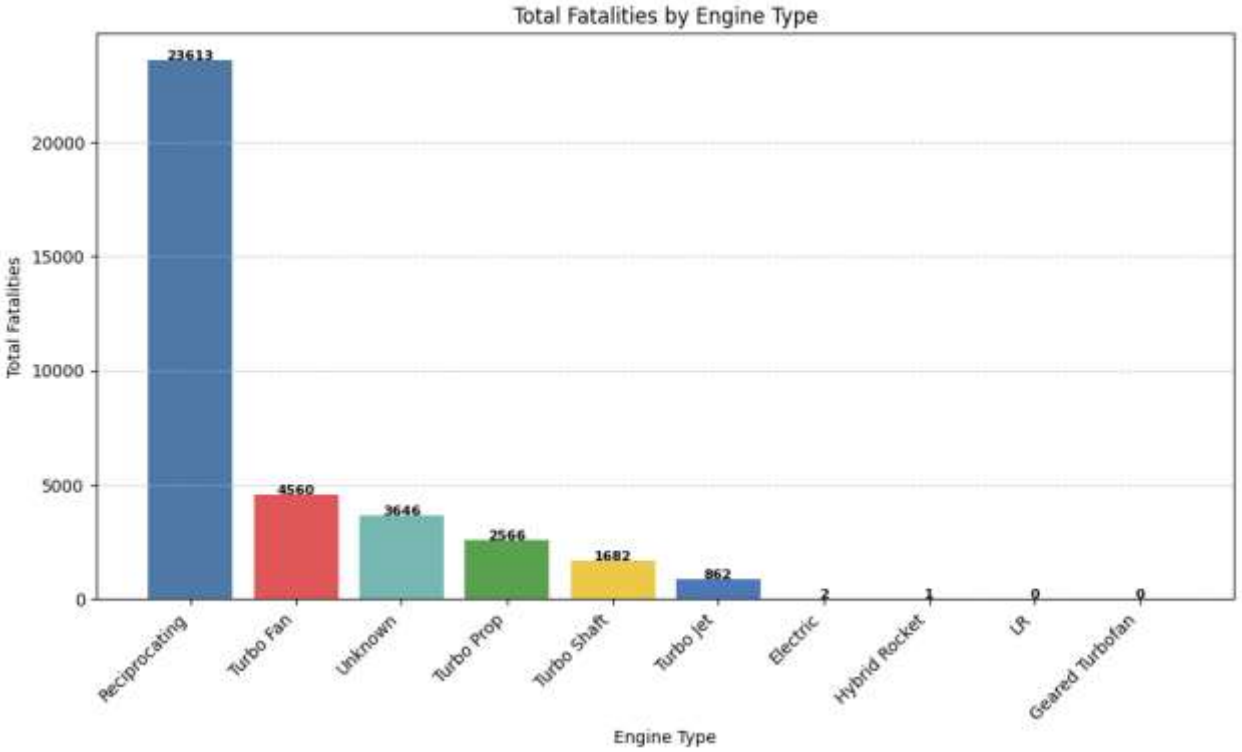
Analysis By Number of Engines

From the analysis of accidents by the number of engines,

- Most accidents occur where planes have one engine.
- Relatively lesser accidents occur where an airplane has more than one engine.

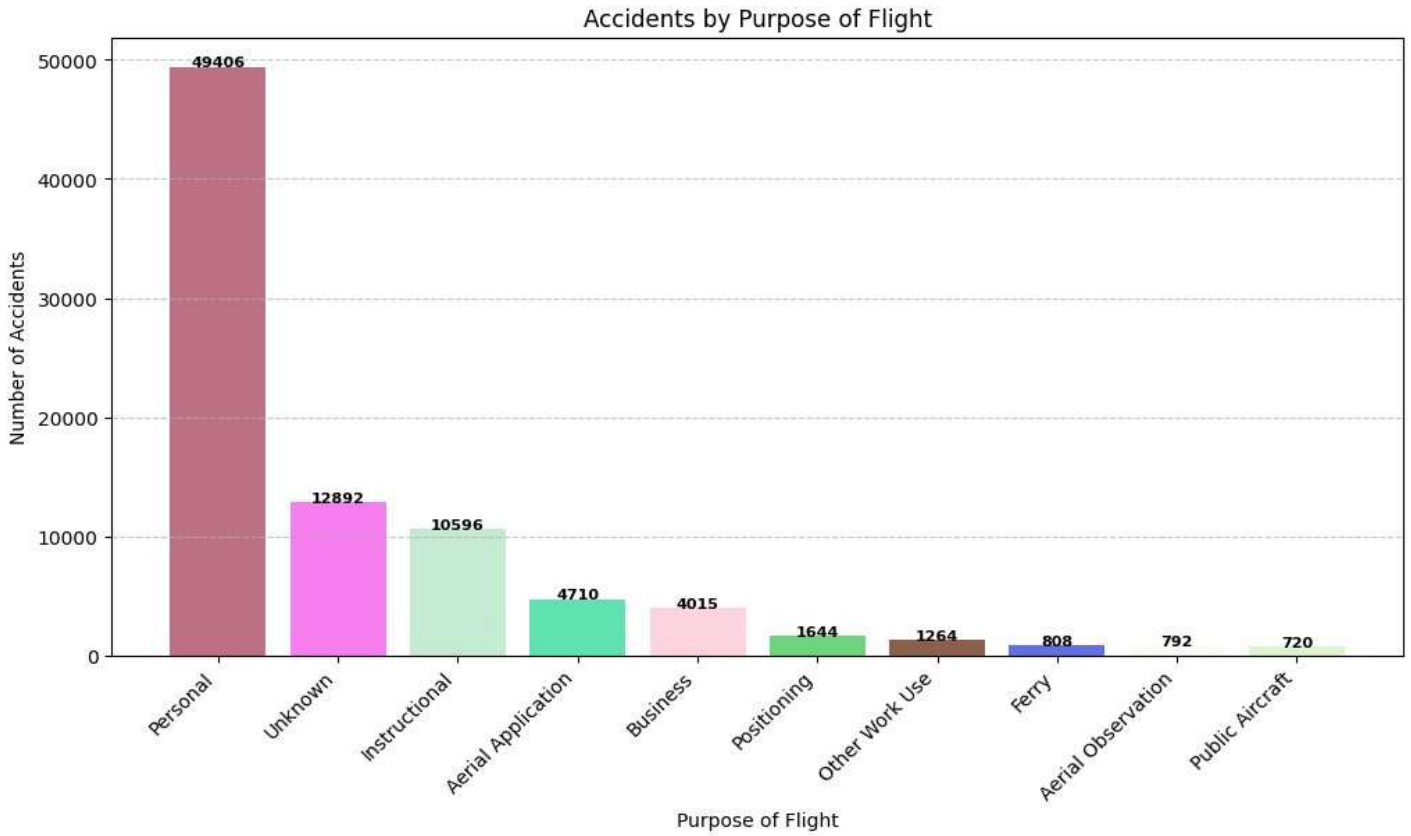


Fatality by Engine Type



- Certain engine types such as **RECIPROCATING** are involved in the most accidents.
- Fatality rate is also high on planes having the same engine.

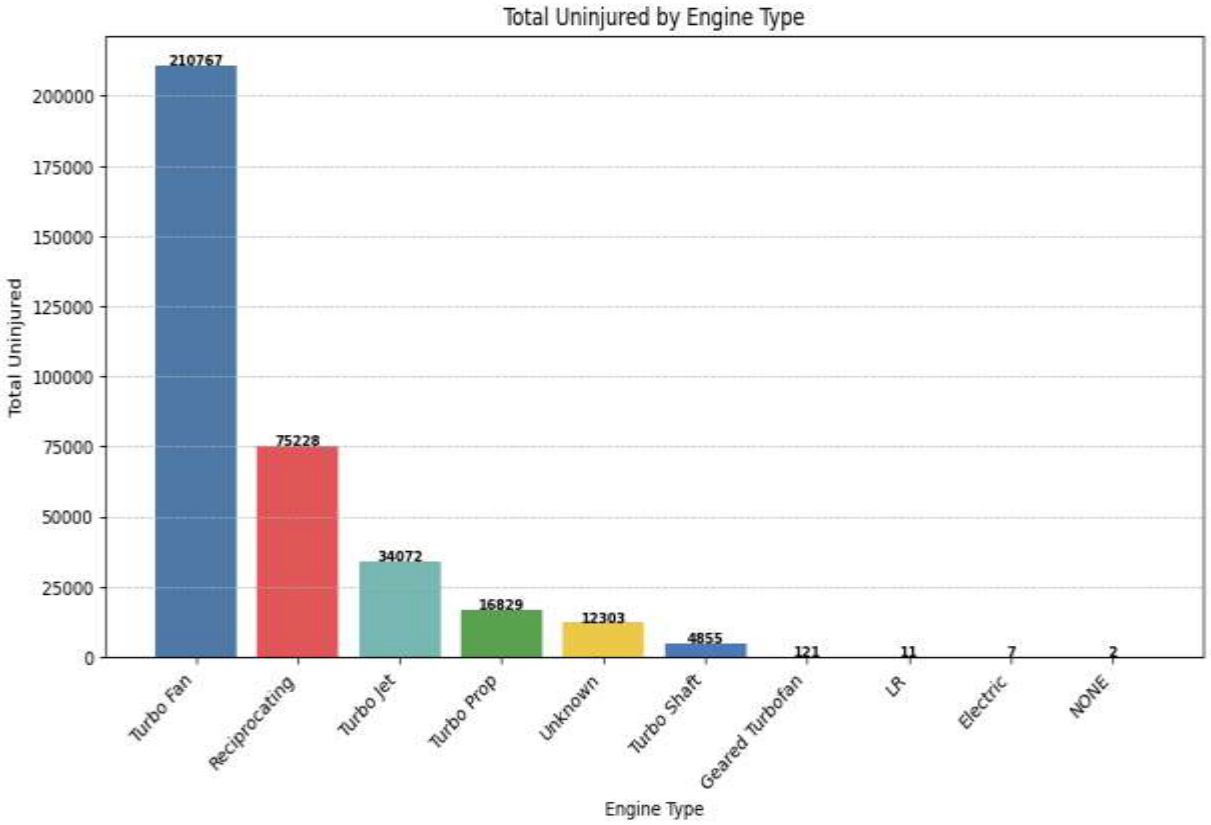
Analysis by Purpose of Flight



- **Personal** use planes tend to be involved in most accidents with almost half the number of accidents reported.

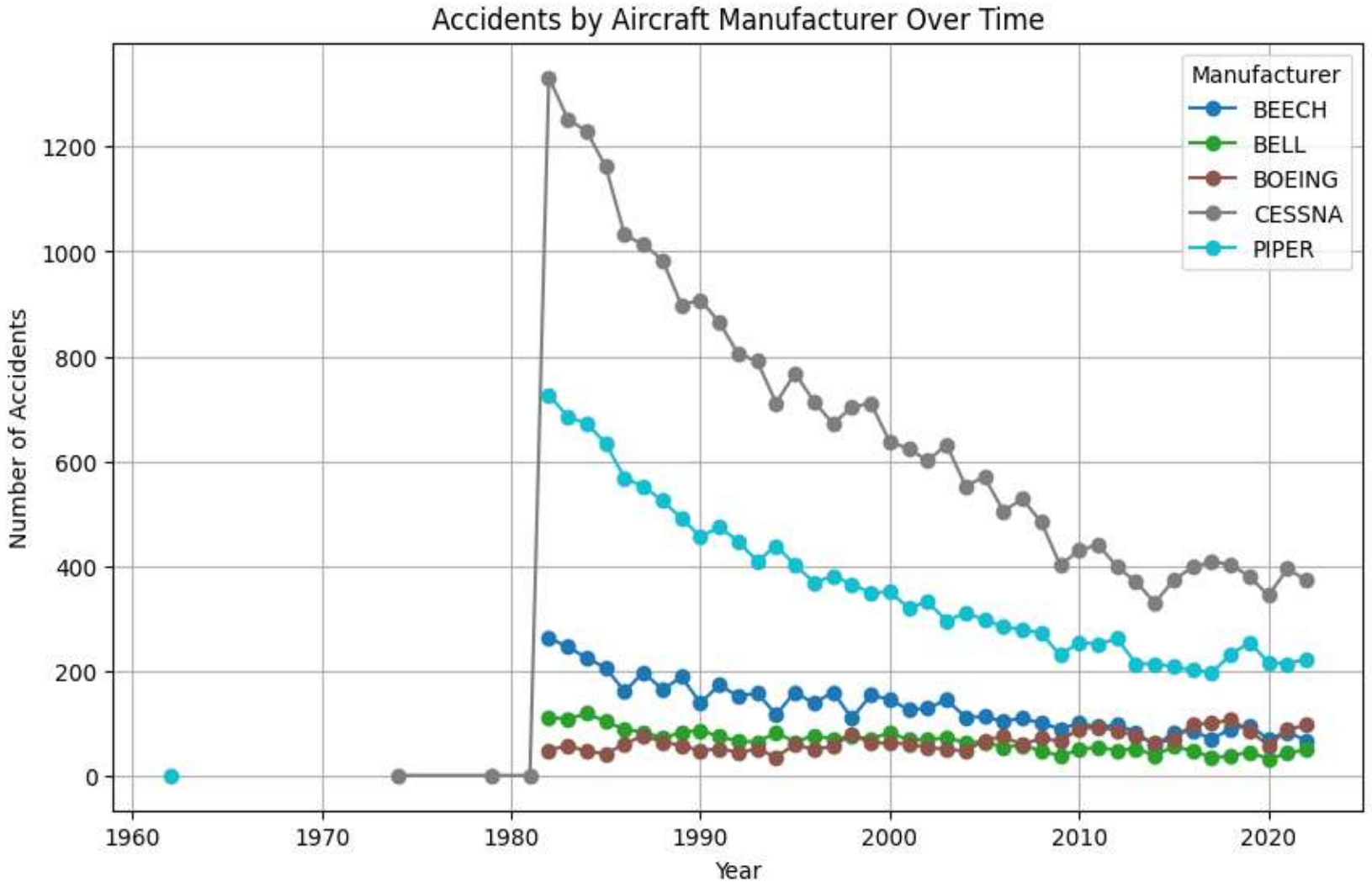
Uninjured Passengers by Engine type

- Planes with **Turbo Fun** are relatively safe compared to other engine types as the number of uninjured passengers is high.



Accidents by Aircraft Manufacturer Over Time

- Aircraft accidents have generally reduced over the years



Recommendations

1. Aircraft Make and Model
   - Focus should be on models and makes with the least number of accidents and a high number of survival rate
2. Engine Type and number of engines
   - Airoplans with more than one engine are relatively save hence should be considired.
3. Flight Purpose and Risk Levels
   - The business should prioritize business and less risky flight purposes when entering the industry.
   - Proper training of pilots and high observation on variours weather conditions should be considered.

Thank you

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