Jeff's PLC Aviation Risk Analysis

SUPPORTING LOW-RISK AIRCRAFT DECISIONS

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Introduction

- Problem Statement: The company is expanding into the aviation industry and needs to assess the risk levels of various aircraft models to make informed purchase decisions.
- Objective: Identify which aircraft are the lowest risk based on historical accident data to guide the selection process for new purchases.
- Why It Matters: Choosing the right aircraft model can help mitigate risks and optimize safety, leading to long-term success in the aviation market.

Project Overview

- Business Expansion: The company is diversifying its portfolio by moving into the aviation industry, specifically by purchasing and operating airplanes.
- Challenges: The company has limited experience with aviation risk and needs reliable data to guide decisions on aircraft purchases.
- Goal: Provide actionable insights that will help the company select aircraft with the lowest risks based on historical accident data.
- Dataset: NTSB Civil Aviation Accidents (1962–2023).

Data

- Data Source: The dataset comes from the National Transportation Safety Board, covering aviation accidents from 1962 to 2023.
- Data Variables: Includes variables like aircraft type, accident severity, accident year, location, and fatalities.
- Data Size: The dataset includes thousands of records from selected domestic and international incidences
- Data Quality: Some missing values and potential data inconsistencies were identified.

Business Understanding

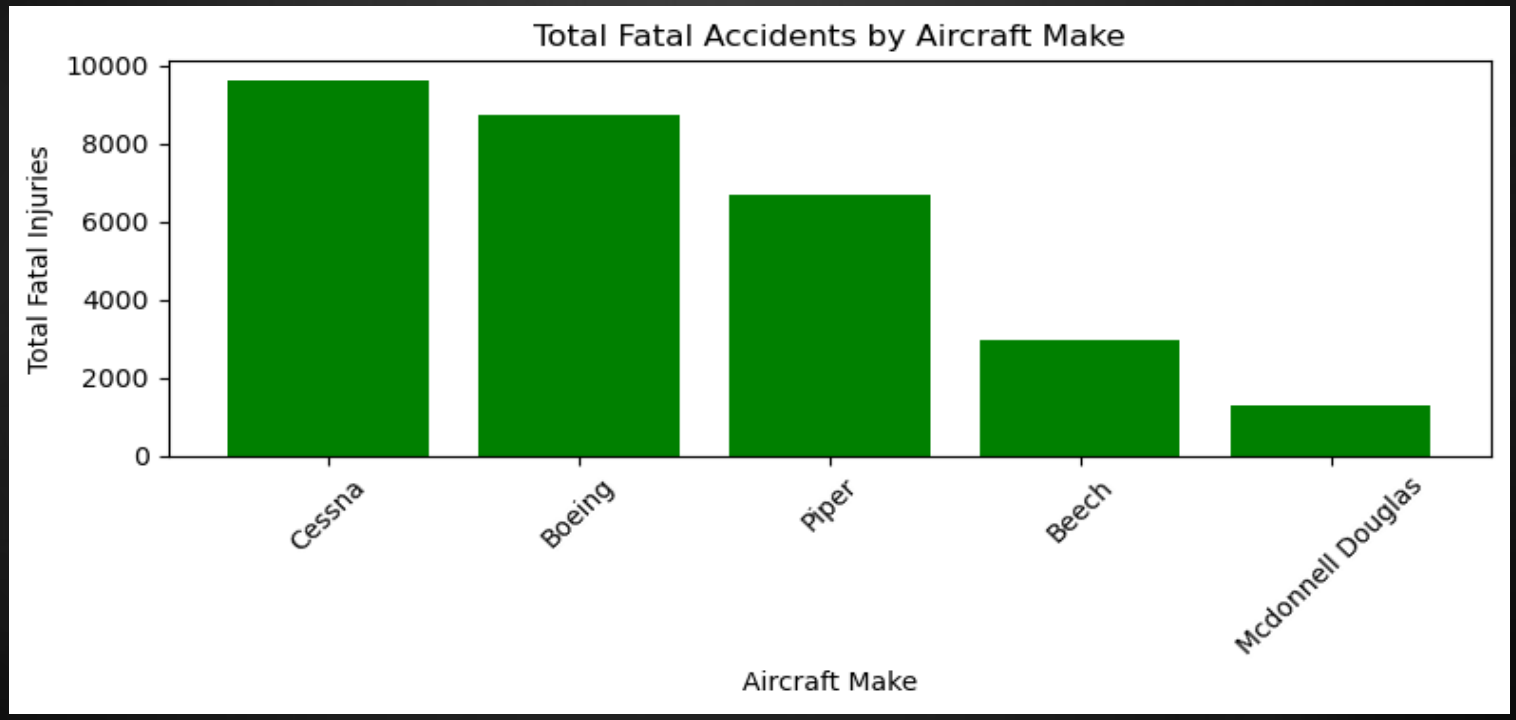
- What types of aircraft have the lowest risk?
- Which makes have lowest fatality counts?
- Where do most accidents occur?
- Which engine types pose the greatest risk?

Data & Methodology

- Source: NTSB Aviation Accident Data (1962–2023)
- Methods: Python (pandas, numpy,matplotlib,)
- Cleaning: Removed duplicates, filled missing values, dropped columns
- Visualizations: 4 key plots with insights

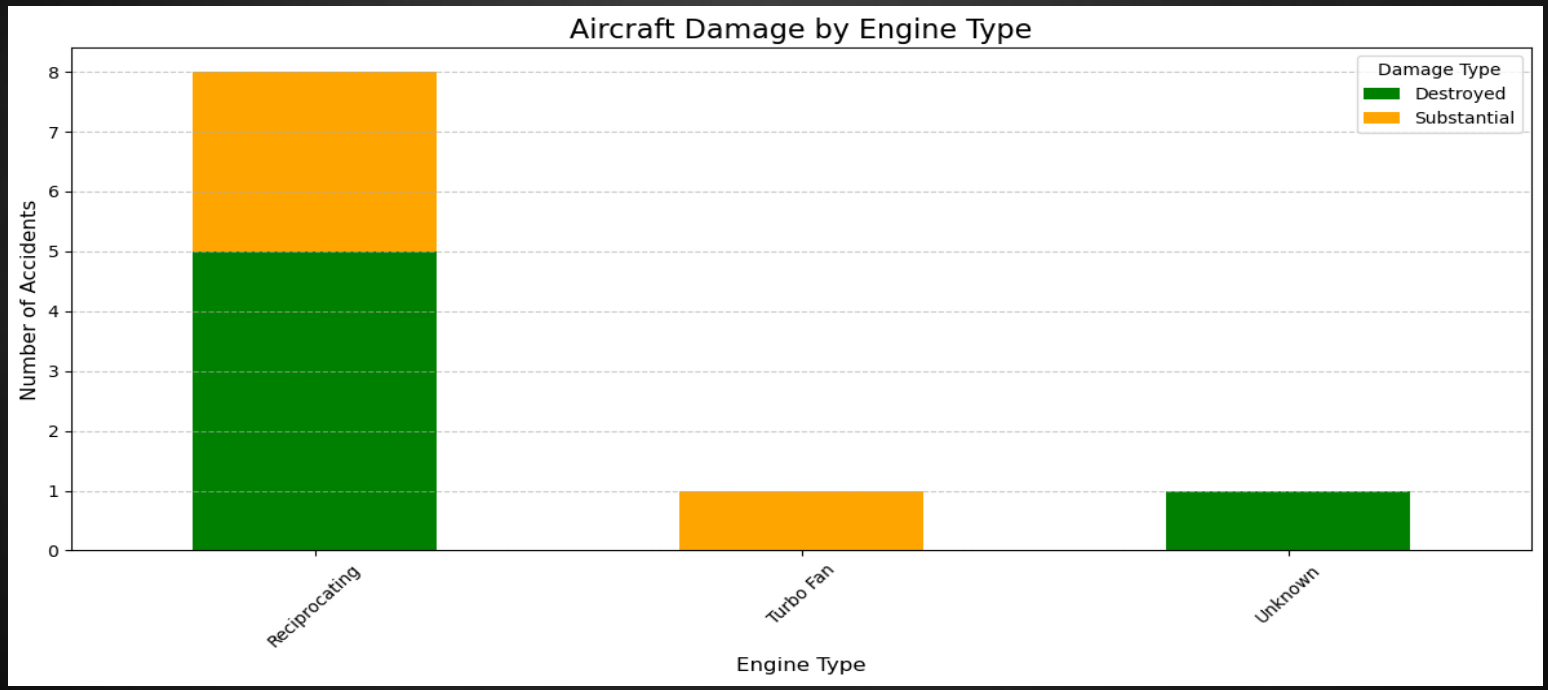
Top Aircraft Makes: Accidents & Fatalities

- • Cessna and Piper appear most in accidents.Beech was noted to have high fatal injuries



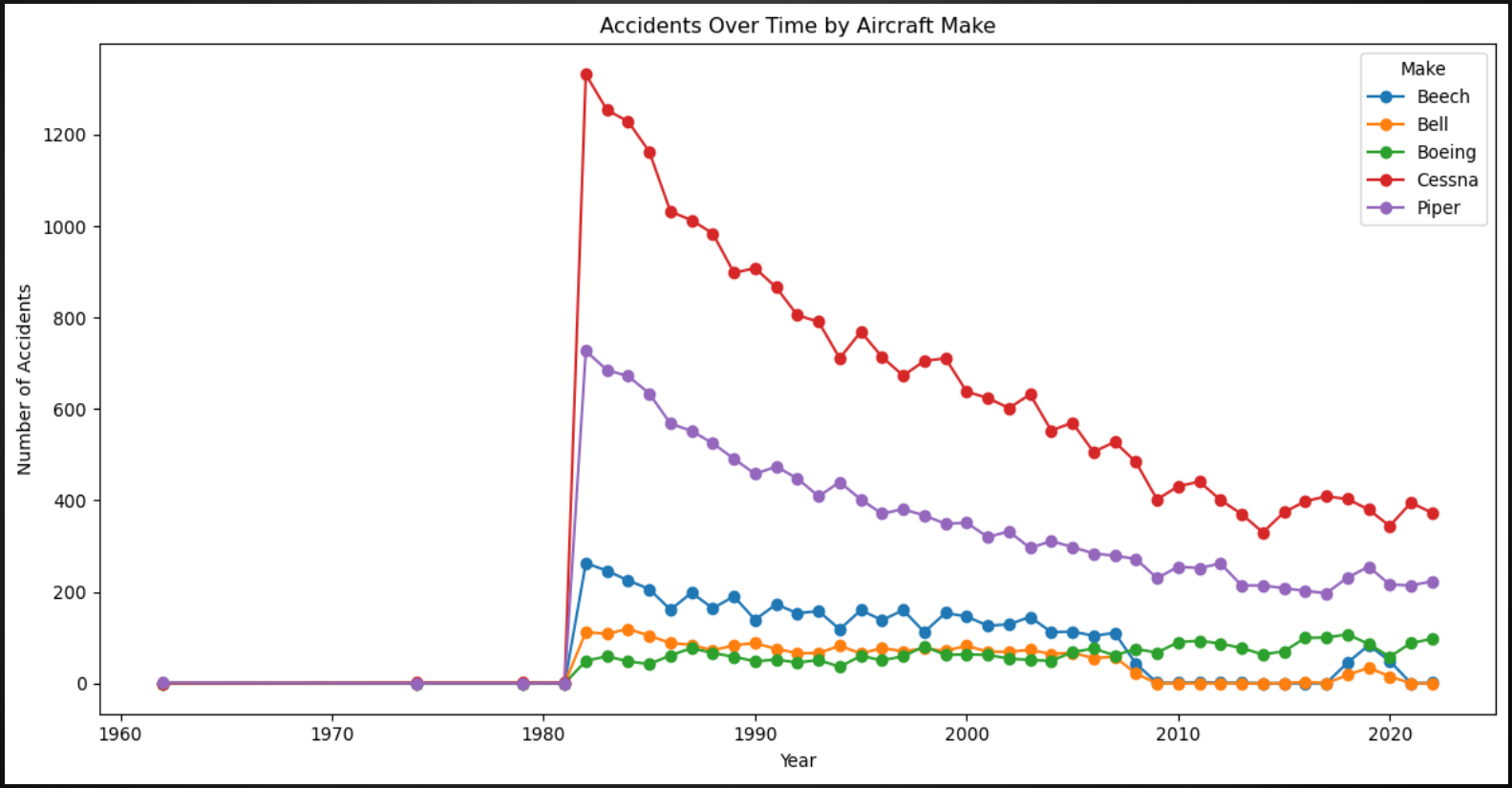
Engine Type vs Aircraft Damage

- • Reciprocating engines frequently linked to extensive damage.Turboprops and turbofans show less damage in accidents.



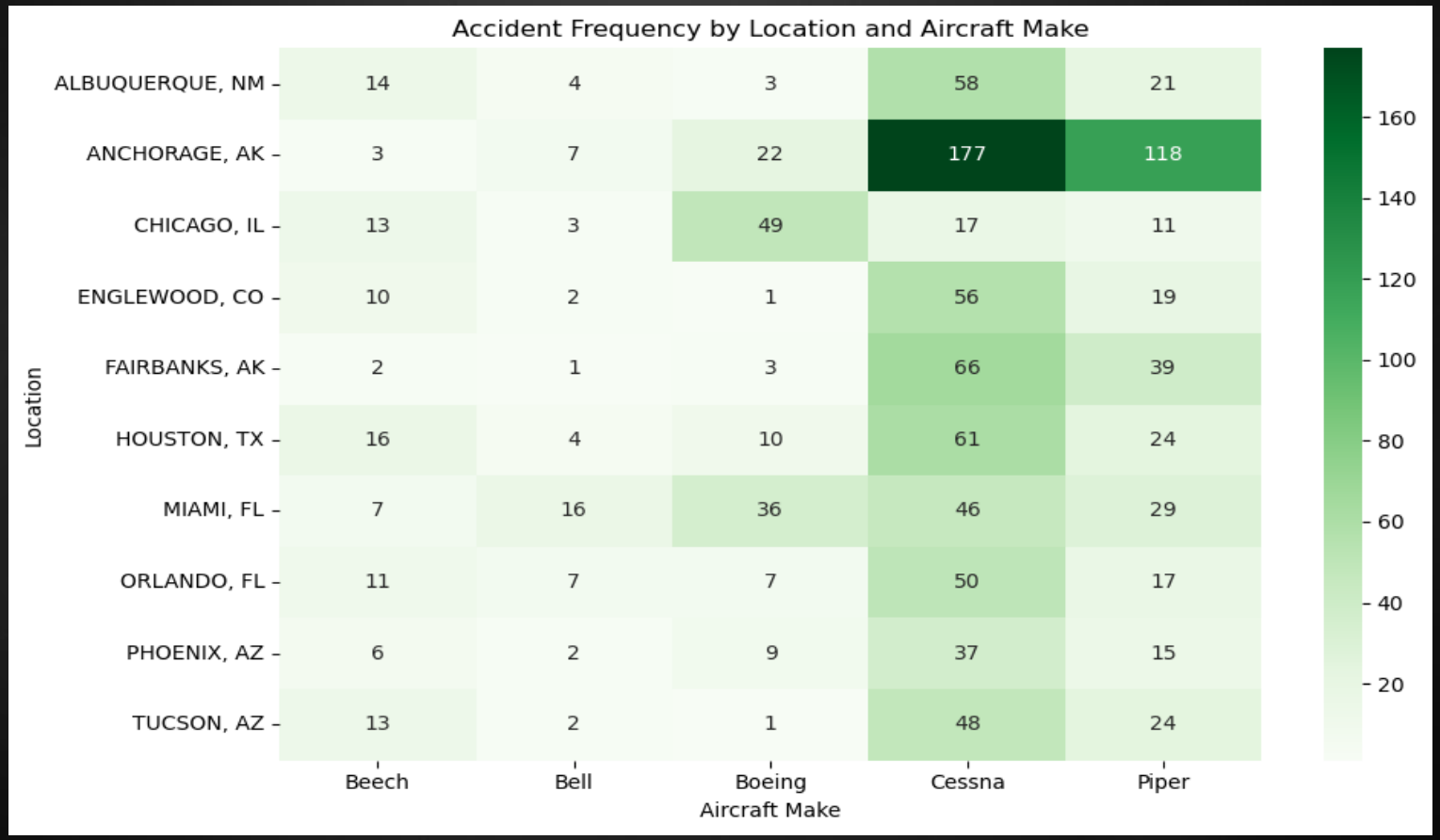
Yearly Trends & Recommendations

- Trends show which makes are improving or worsening over time. Favor aircraft with steady safety records



Accident Counts by Location and Make

Cessna and Piper have had frequent accidents in Anchorage,AK.



Recommendations

- Avoid Cessna and Piper aircrafts as they have high rate of accidents, although watch out for those with higher fatality injuries like Beech.
- Prioritize Bell, Boeing and Beech as they have consistent safety performance over time.
- Avoid Reciprocating Engines in early fleet

Thank You

Any Questions?

Let's connect!

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