Aviation Risk Assessment

BY PATRICK MAINA

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Overview

Introduction

- This project aims to examine aviation accidents and assess risk factors associated with aviation incidents.

- By leveraging Data Analysis techniques such as statistical data analysis, and data visualization, I aim to explore the relationships between the various aviation incident aspects, and draw key insights that will be valuable in drawing data-driven decisions.

Project Objectives

- Identify Low-Risk Aircraft Models & Manufacturers

- Evaluate Risk Factors Influencing Aircraft Safety

- Provide Actionable insights for robust decision-making

Data Summary

- The Aviation Dataset from Kaggle consists of Aviation accident reports from 1948 to 2024, which contain the following key features:
  - Aircraft Information
  - Flight Metadata
  - Injury Data
  - Geographical Data
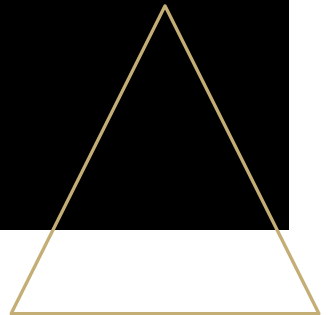
What are the most common causes of aviation incidents? (mechanical failure, pilot error, etc)
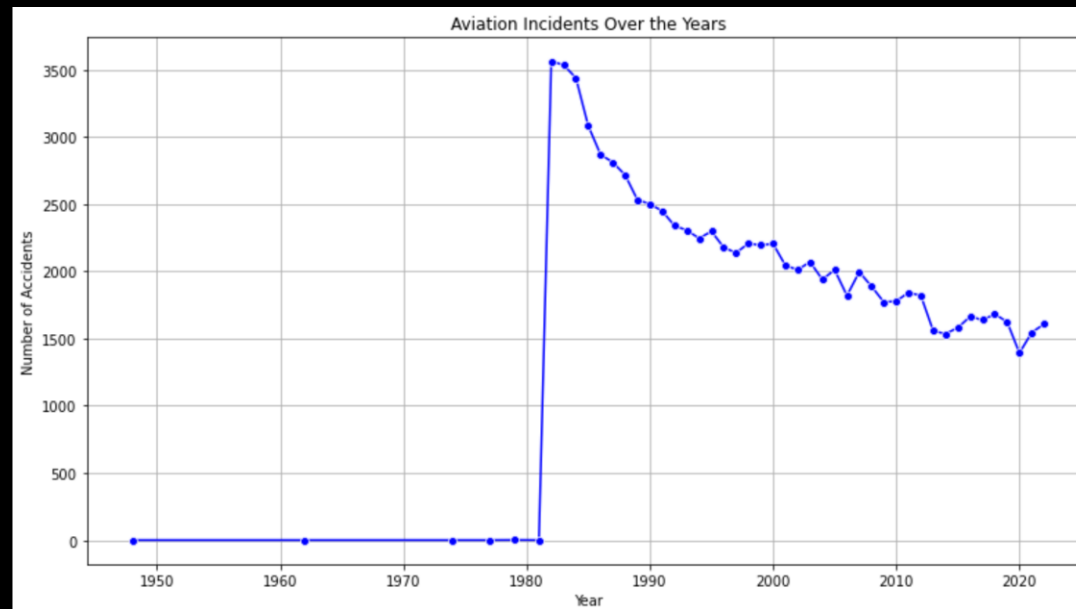
During which phase of flight do most accidents occur? (Takeoff, Cruising, Landing)

Research Questions

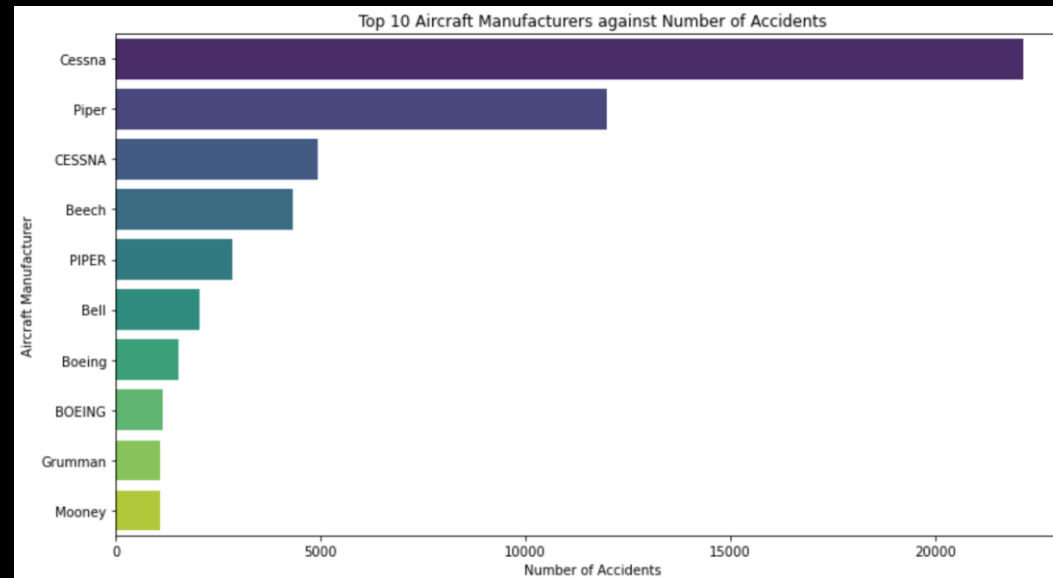# Data Analysis

❖ Accident trends over time

- A time-series plot analyzing the trends in accident incidents over the years.
- This aids in identifying peak accident periods.

Data Analysis (cont'd)

❖ Number of accidents by Aircraft Manufacturers

- A horizontal bar plot that investigates the number of accidents by different aircraft manufacturers.

- This gives insights into the trends of aircraft manufacturers with number of accidents, prompting looking into different aircraft aspects such as avionics and quality of the engines.

Data Analysis (cont'd)

❖ Tableau Interactive Dashboard

- This interactive dashboard provides different insights based on the dataset.

- Some of these insights include damages in aircrafts by number of engines, Total fatal injuries and total uninjured by the phase of flight, etc.

- Business stakeholders can use these insights to draw valuable insights on trends in aviation incidents, and take measures to mitigate the risks involved.

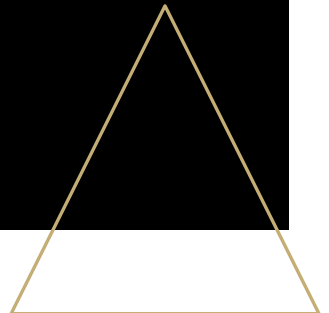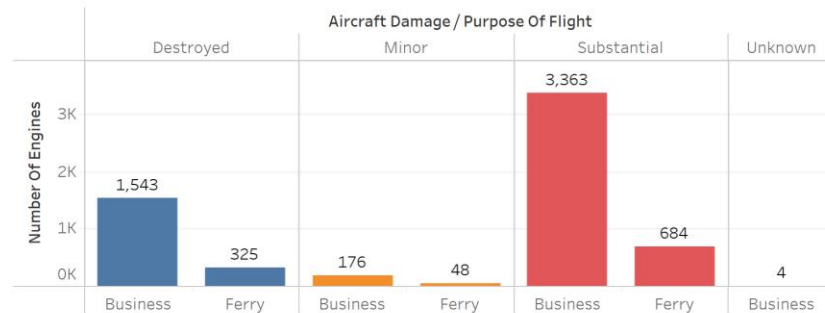- The Tableau Dashboard can be found in the Tableau Public Webpage.

Tableau Dashboard
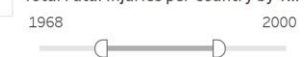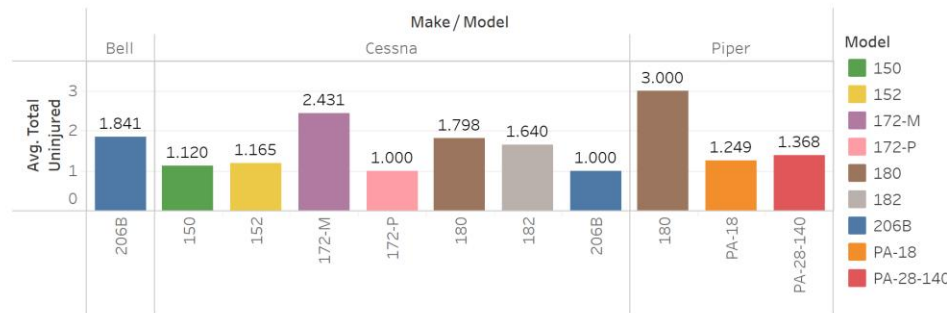
Conclusion

This analysis provides valuable insights into the aviation accidents data. By performing data visualization using various plots, we can gain a deeper comprehension of the frequency of accidents, the severity of injuriesm the impact of weather conditions, and the correlation between various features. By identifying patterns and trends, we can better prepare for, and respond to potential accidents.

Recommendations

- Since most accidents take place during Takeoff and Landing from my analysis, it is important to emphasize comprehensive pilot training, and enhanced aircraft landing systems.

- Because aircrafts with multi-engine systems tend to have higher survival rates, I would suggest looking into aircrafts with engine redundancy, since it plays a crucial role in aircraft safety and survi

Contact Details

- **Email:** Patrick Maina

- **LinkedIn:** **Patrick Maina**

- **Github:** **Patricknmaina**