AVIATION ACCIDENT DATABASE AND SYNOPSES, UP TO 2023.

AN ANALYSIS

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OVERVIEW

- In this presentation, we'll delve into the world of aviation safety using data from the National Transportation Safety Board (NTSB) Aviation Accident Database. This database is a valuable resource, containing information on civil aviation accidents and incidents dating back to 1962 and up to 2023. Our goal is to leverage this data to guide our company's new venture into the aviation industry. By analyzing accident trends and risk factors, we can identify the safest aircraft types for our commercial and private operations.

BUSINESS UNDERSTANDING

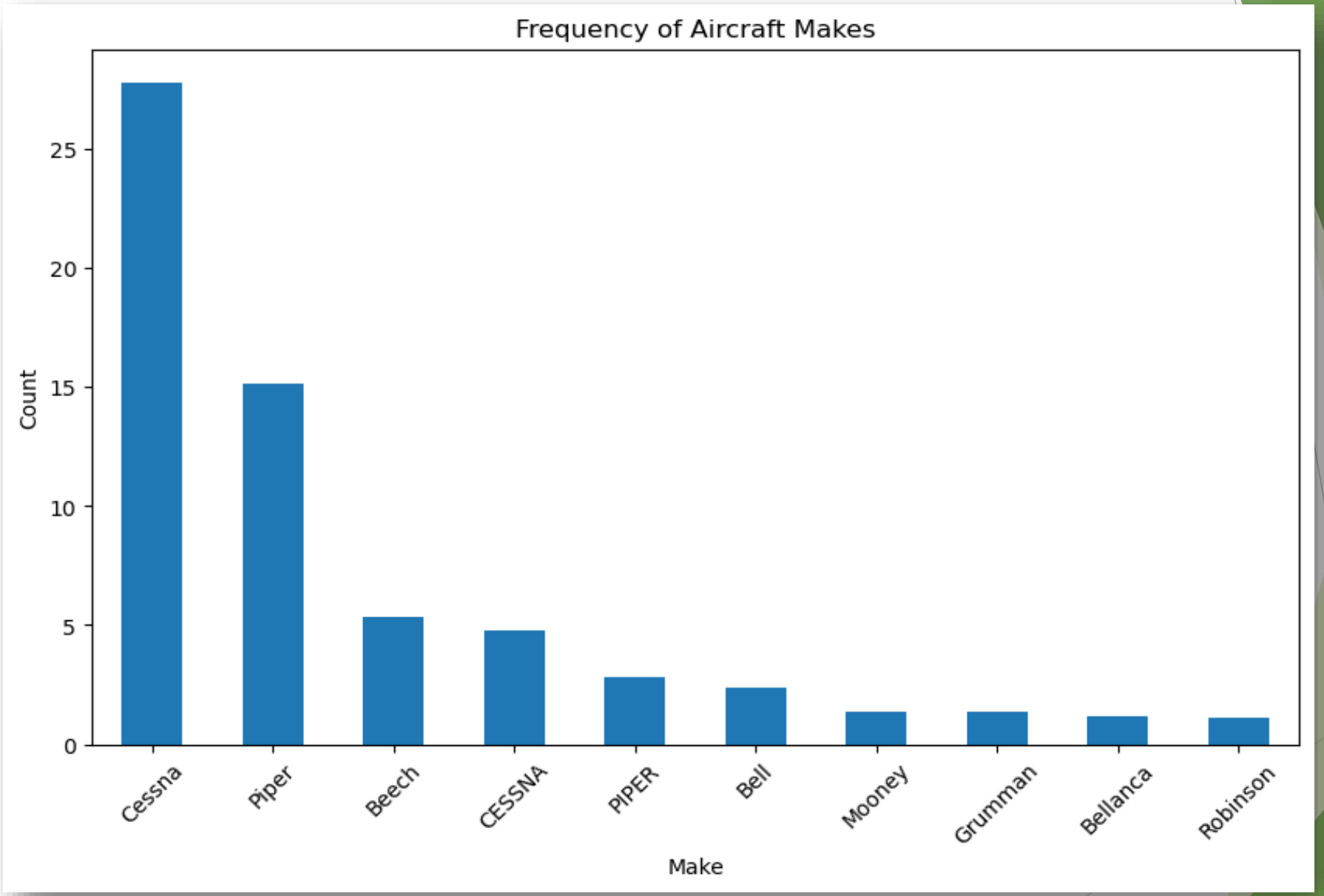
- The primary objective of this analysis is to enhance aviation safety and operational efficiency by understanding the major causes of aviation accidents and identifying patterns and trends. This understanding will enable us to make informed decisions regarding aircraft purchases, pilot training, and operational protocols, ultimately reducing the risk of accidents and improving overall safety.

DATA UNDERSTANDING

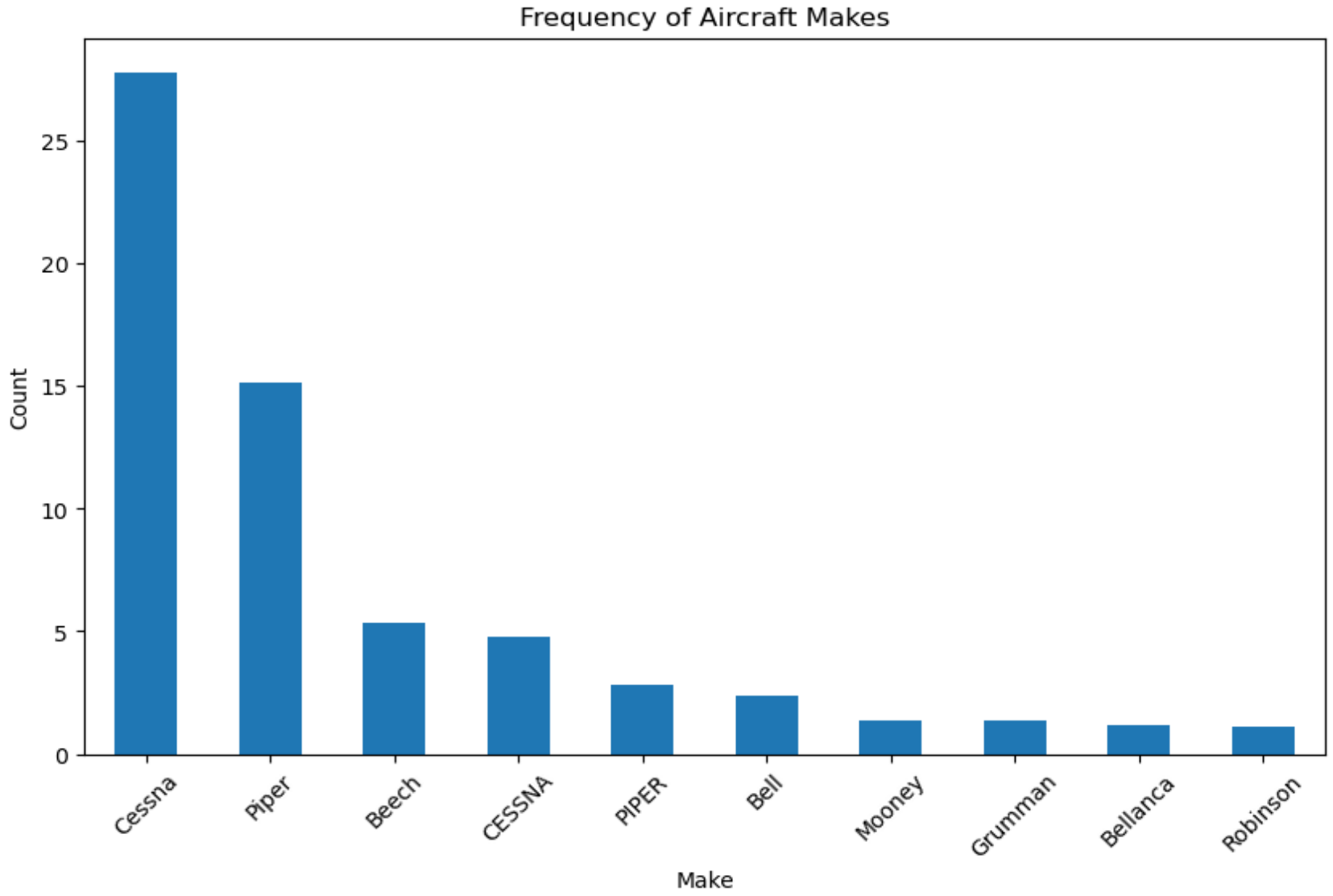
- The "Aviation Accident Database & Synopses,upto 2023" dataset includes:
- **Accident and Incident Data**: Records of aviation accidents and incidents with details like date, location, and severity.
- **Aircraft Information**: Data about the aircraft involved, including model, manufacturer, and registration.
- **Synopsis**: Summaries providing context and initial findings.
- **Cause and Contributing Factors**: Identified causes and contributing factors for each event.
- **Weather Conditions**: Weather data at the time of each accident or incident.
- **Operational Context**: Information about flight phase and operation type.

DATA ANALYSIS

- Our analysis involved several key steps:
- **Data Cleaning**: We handled missing values, checked for duplicates, and fixed any structural issues in the dataset.
- **Exploratory Analysis**: We examined various factors such as the frequency of accidents by aircraft make, the impact of weather conditions, and the distribution of accidents across different countries.
- **Graphs and Visualizations**: We created multiple visualizations to understand the data better. For instance:
  - **Bar Charts**: Showing the frequency of top 10 aircraft makes by Total Injuries
  - **Pie Charts**: Illustrated the proportion of different engine types used by various aircraft makes.
  - **Geographical Plots**: Displayed frequency of aircraft makes by country


Frequency of Aircraft Makes
Count
0
5
10
15
20
25
Cessna
Piper
Beech
CESSNA
PIPER
Bell
Mooney
Grumman
Bellanca
Robinson
Make

BAR CHART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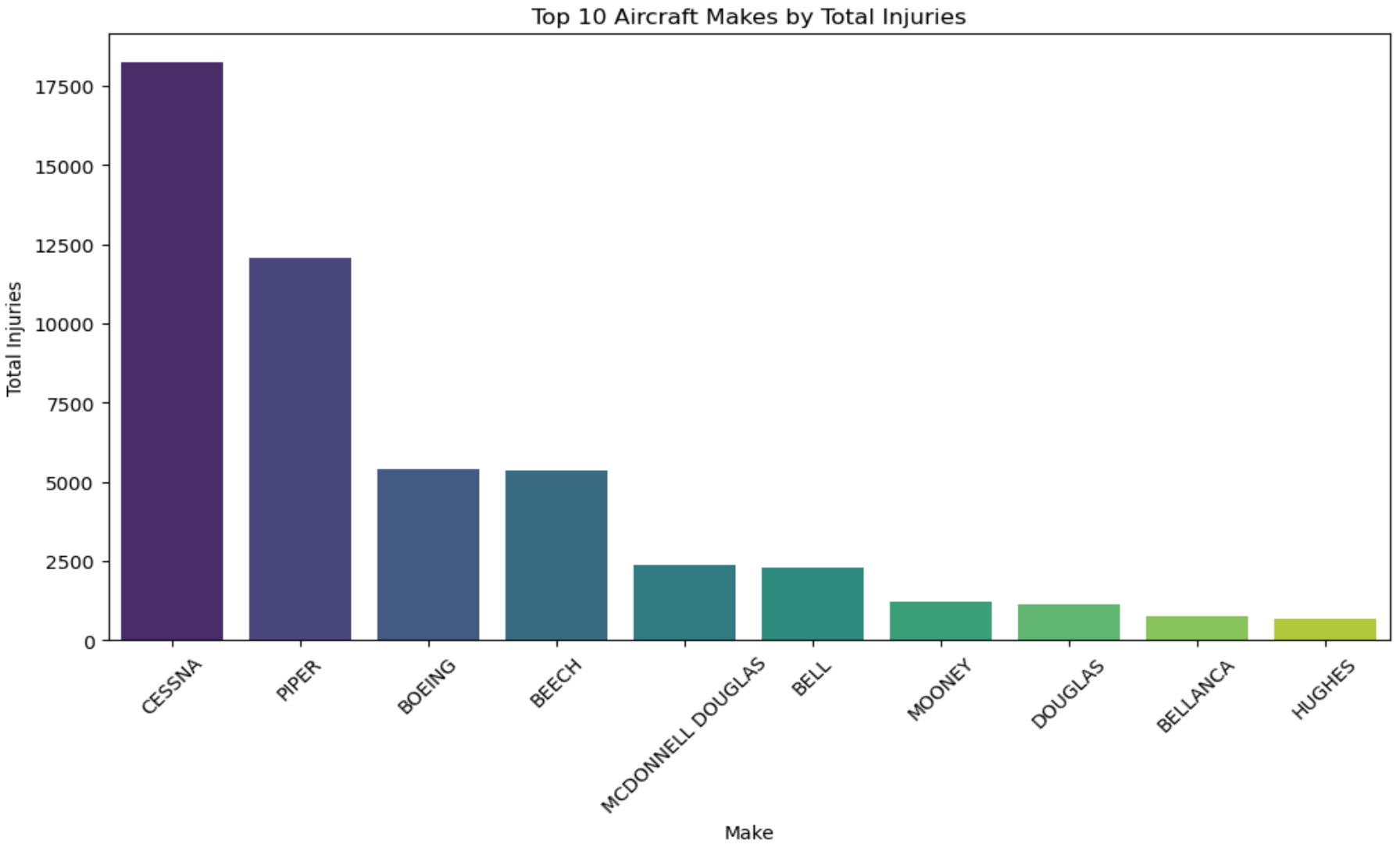
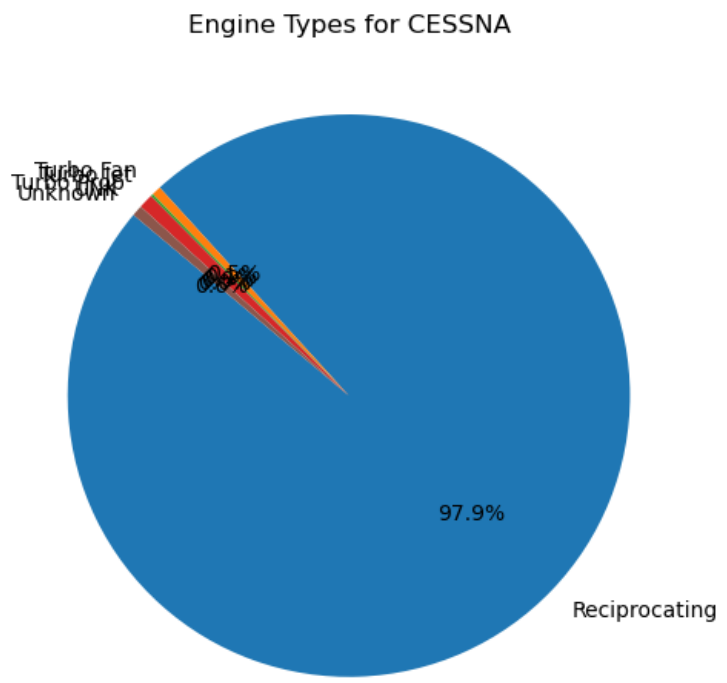
Bar chart

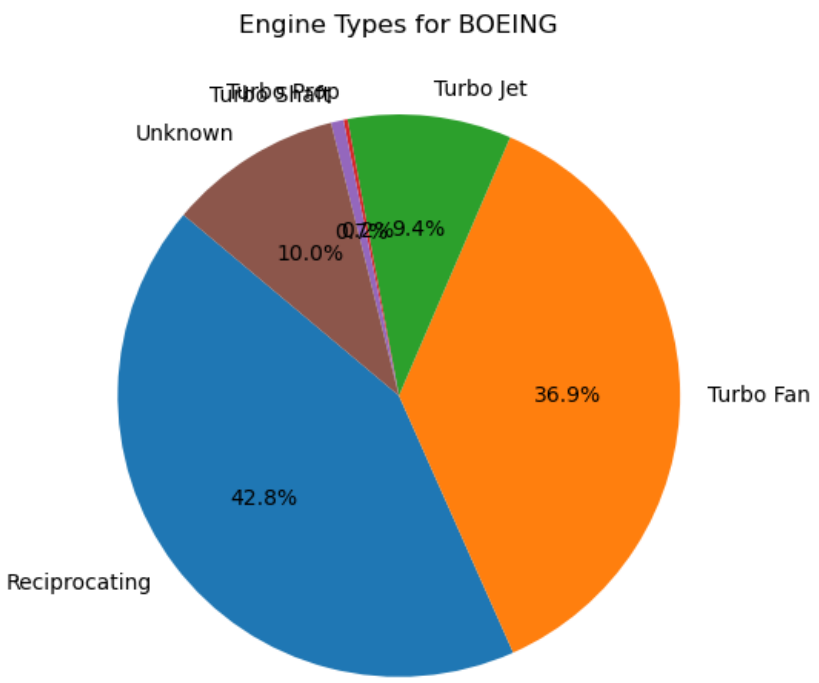
Showing the frequency of top 10 aircraft makes by Total Injuries

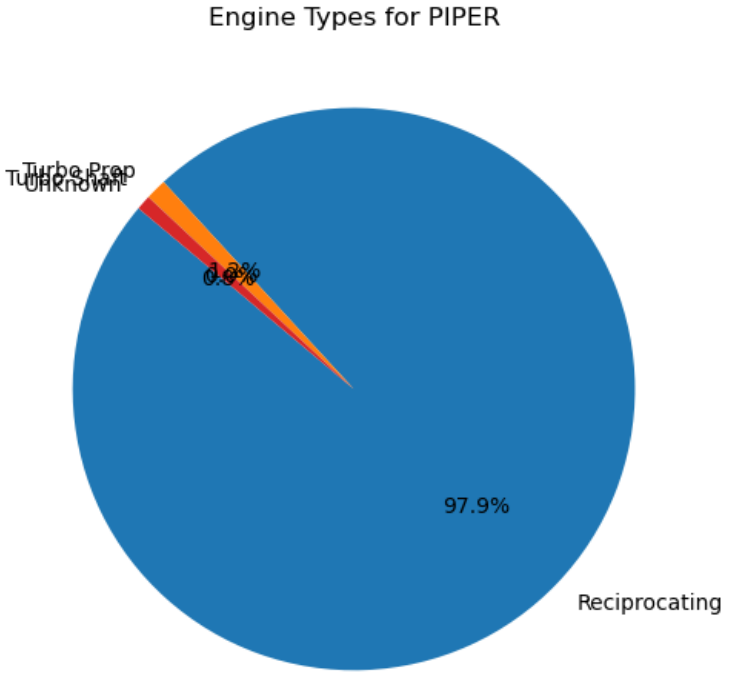


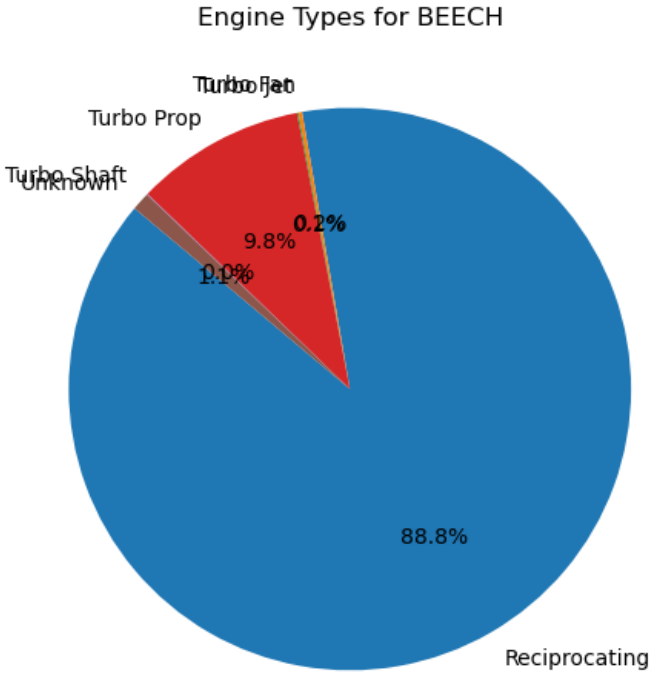
PIE CHART

Illustrating the proportion of different engine types used by various aircraft makes.



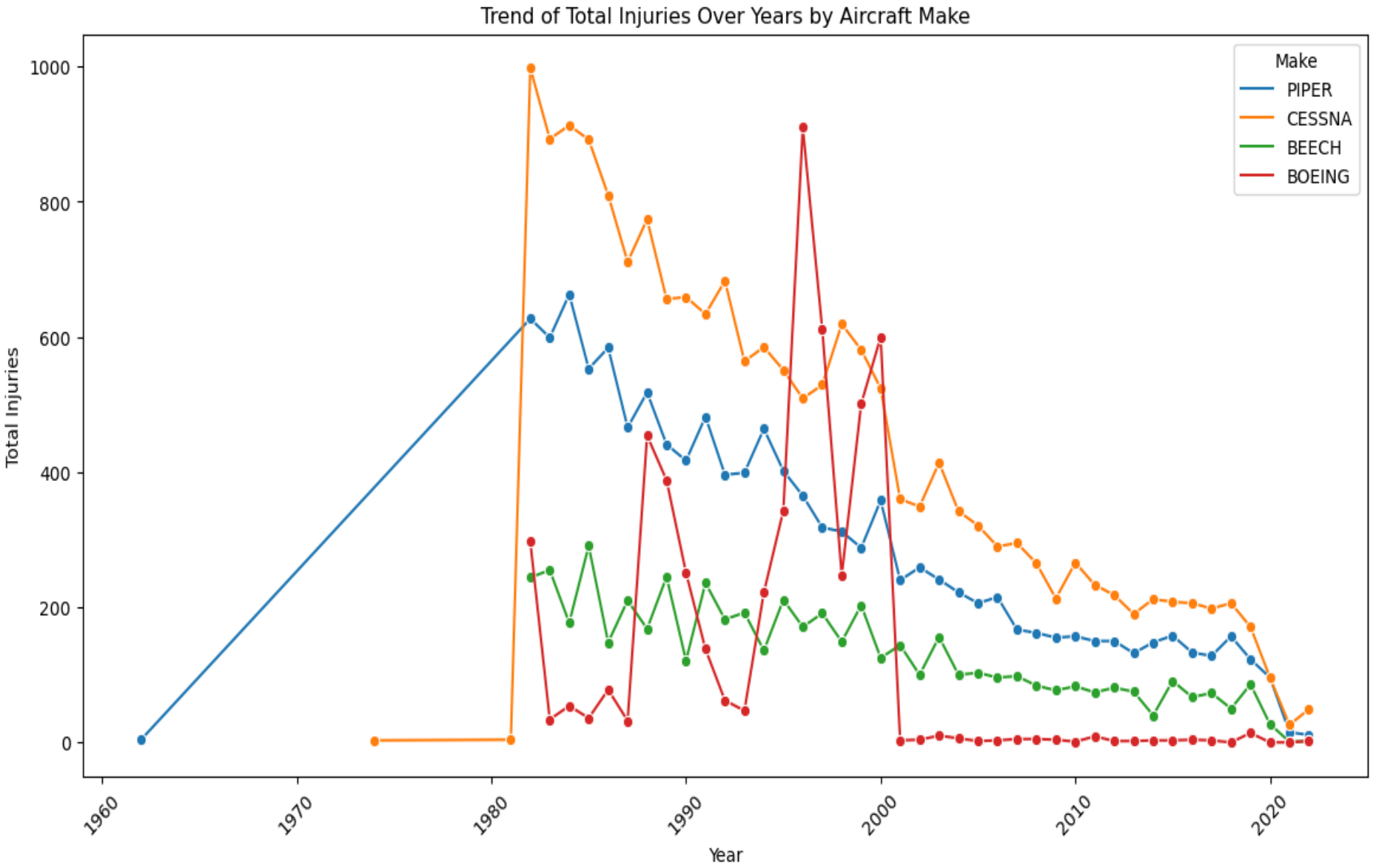






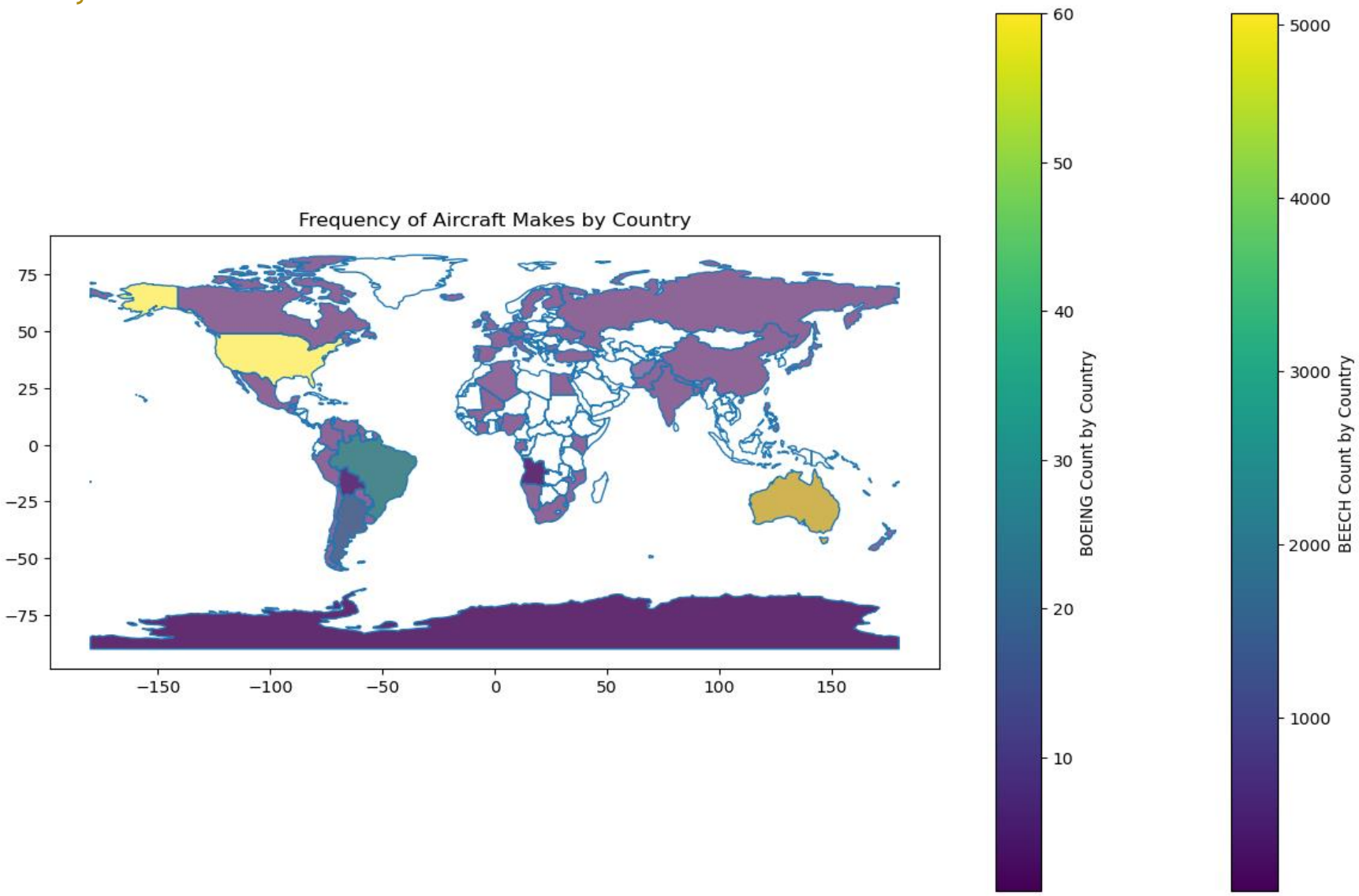
LINE CHART

Displaying the trend of Total Injuries over Years by Aircraft Make.



GEOGRAPHICAL PLOT

Displayed the frequency of Aircraft Makes by country



RECOMMENDATIONS

- Based on our findings, we have several recommendations to enhance aviation safety:
- **Enhanced Training for Personal Pilots**: Given the high number of incidents in personal flights, improving pilot training programs for non-commercial pilots could reduce accident rates.
- **Weather-Related Protocols**: Even though most flights occur in clear weather, developing more robust weather-related protocols can help mitigate risks under all conditions.
- **Engine and Aircraft Maintenance**: Regular and thorough maintenance checks, especially for commonly used engine types, can prevent mechanical failures that lead to accidents.

NEXT STEPS

- To continue improving aviation safety, we suggest the following next steps:
- **Implementing Safety Recommendations**: Work with aviation authorities to implement the recommended safety measures.
- **Ongoing Data Collection and Analysis**: Continue to collect and analyze data to monitor the effectiveness of implemented safety measures and to identify new trends or risks.
- **Collaboration with Aviation Experts**: Engage with industry experts to refine safety protocols and training programs based on the latest findings and technological advancements.

THANK YOU

Thank you for your attention. We look forward to implementing these findings to enhance our aviation safety and operational efficiency.

This project is available on my github (https://github.com/Namnyak/FINAL-PROJECT).

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