Sub title: : Identifying Low-Risk Aircraft for Our Aviation Venture

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OVERVIEW

- **Goal:** Help the company identify the *lowest risk* aircraft to purchase.
- To identify aircraft types that present the lowest initial risk for the company's entry into commercial and private aviation operations.
- This project analyzes aviation incident data to uncover trends, frequent aircraft types involved, and patterns over time.
- The goal is to assist our company decision-making towards this new venture.
- **Data:** Aviation accidents from the NTSB (1962–2023).

BUSINESS UNDERSTANDING

- Problem: Company expanding into aviation but needs low-risk aircraft to minimize liability and maximize safety.
- Which aircraft types and manufacturers are associated with fewer or less severe accidents?
- How have aviation incidents changed over time?
- Are there seasonal patterns in accident frequency?
- Which aircraft types have the fewest serious accidents?
- Are there certain manufacturers with safer records?

DATA UNDERSTANDING

- The dataset contains aviation accident data from the NTSB, spanning from 1962 to 2023.
- Key variables include:
- Make: Aircraft manufacturer
- Model: Aircraft model
- Event_Date: Date of the accident
- Injury_Severity: Severity of injuries
- The data has some missing values, which were handled during the analysis.

TOP AIRCRAFT MANUFACTURERS

- Data was cleaned to ensure consistency and accuracy.
- Missing values were imputed or dropped where appropriate.
- The Event_Date column was converted to datetime format for time-based analysis.
- Feature engineering was performed to calculate accident rates and severity.

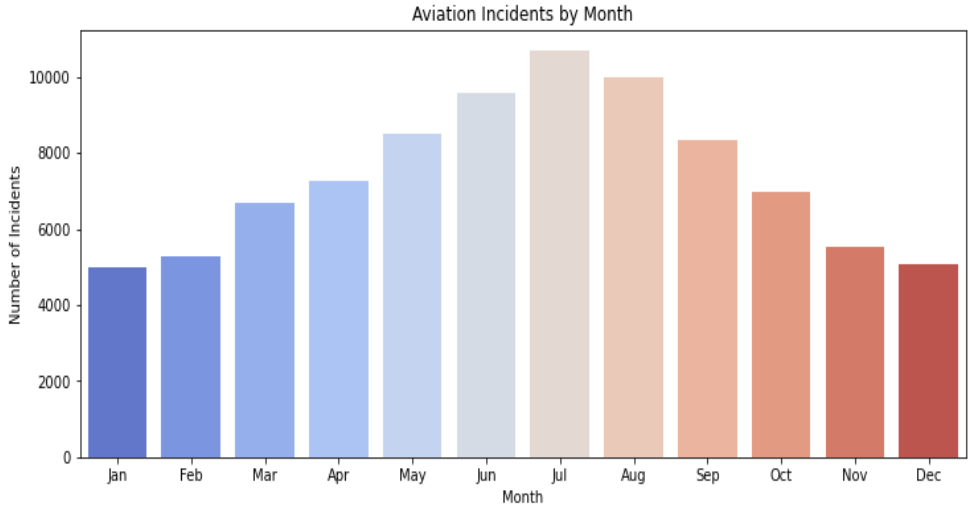
INJURY SEVERITY DISTRIBUTION

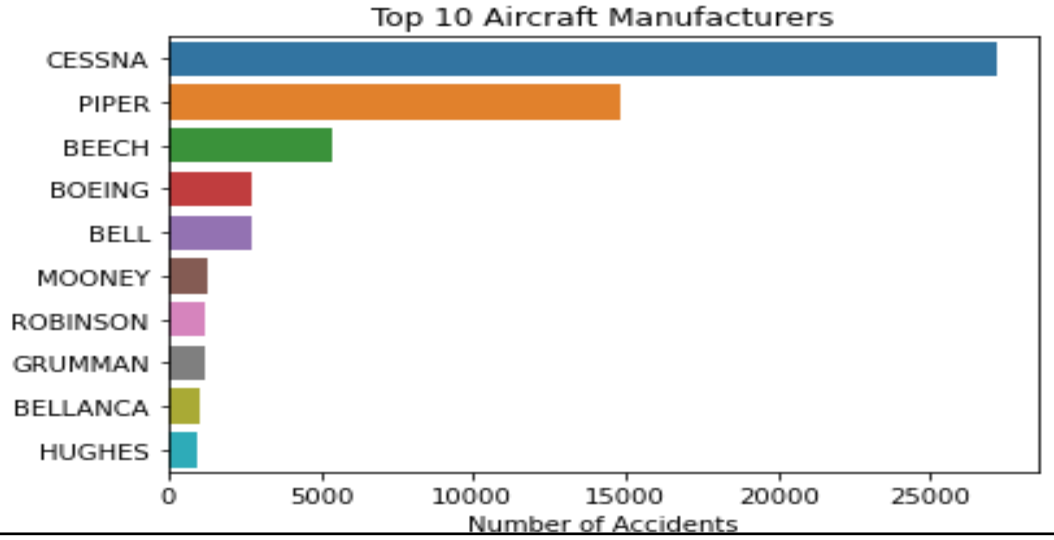
- Lowest Risk Aircraft Manufacturers:Hughes, Bellanca, Grumman, Robinson, and Mooney
- Higher Risk Aircraft Manufacturers: Cessna, Piper, and Beech
- Accident Trends Over Time: Accident rates have generally decreased over time, particularly after 2000.
- Monthly Trends: Certain months show spikes in accidents (summer months) possibly due to increased travel frequency.
- Severity of Accidents: Most accidents are minor, but fatal ones are concentrated in certain models.

ACCIDENTS OVER TIME

- Accidents by month(left)

-Accidents by make(below)





RECOMMENDATIONS

- Accident Frequency by Manufacturer: A bar chart showing the number of accidents for each manufacturer, highlighting the manufacturers with the highest and lowest accident rates.
- Accident Severity by Aircraft Model: A chart (e.g., a stacked bar chart) showing the distribution of injury severity (minor, serious, fatal) for different aircraft models.
- Accidents Over Time: A line chart showing the trend of accident frequency over the years, with a focus on the period before and after 2000.
- Monthly Accident Frequency: A plot showing how accident frequency varies by month.

NEXT STEPS

- Prefer Aircraft from Hughes, Bellanca, Grumman, Robinson, and Mooney: Based on lower accident rates and severity.
- Avoid Cessna, Piper, and Beech: Due to higher fatality rates.
- Focus on Newer Models (Post-2000): Accident rates are lower after 2000.

THANK YOU!