

Title: Understanding Aircraft Accidents: A Data-Driven Approach

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Business Understanding

- Problem Statement: The aviation industry faces challenges related to aircraft accidents, leading to loss of life, property damage, and economic consequences.
- Objective: This analysis aims to gain insights into the factors contributing to aircraft accidents, identify areas for improvement, and inform safety recommendations.
- Data: The analysis will be based on a dataset containing information about aircraft accidents, including:
 - Aircraft Damage
 - Aircraft Category
 - Make
 - Total Fatal Injuries
 - Total Serious Injuries
 - Total Minor Injuries
 - Total Uninjured

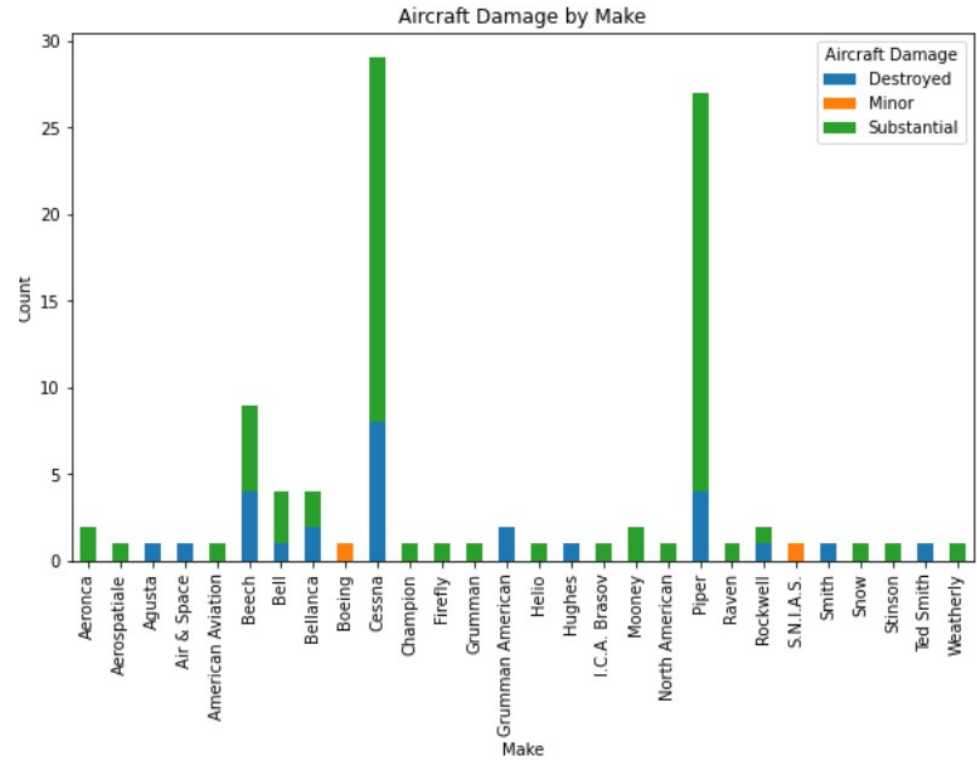
Data Exploration

- **Summary statistics**

The correlation coefficient of 0.90 confirms this strong positive relationship. A value close to 1 indicates a strong positive correlation, while a value close to -1 indicates a strong negative correlation. In this case, the high positive correlation indicates that as aircraft size increases, the number of fatal injuries tends to increase as well.

Aircraft Damage Analysis

- The bar graph shows the aircraft by make and the aircraft damage level of each aircraft.



Aircraft Category and Accident Rates

- Heat map

Airplane category generally has higher accident rates compared to Helicopter and Balloon. Helicopter category has the lowest accident rates overall.

Cessna and Piper have relatively high accident rates across multiple categories.

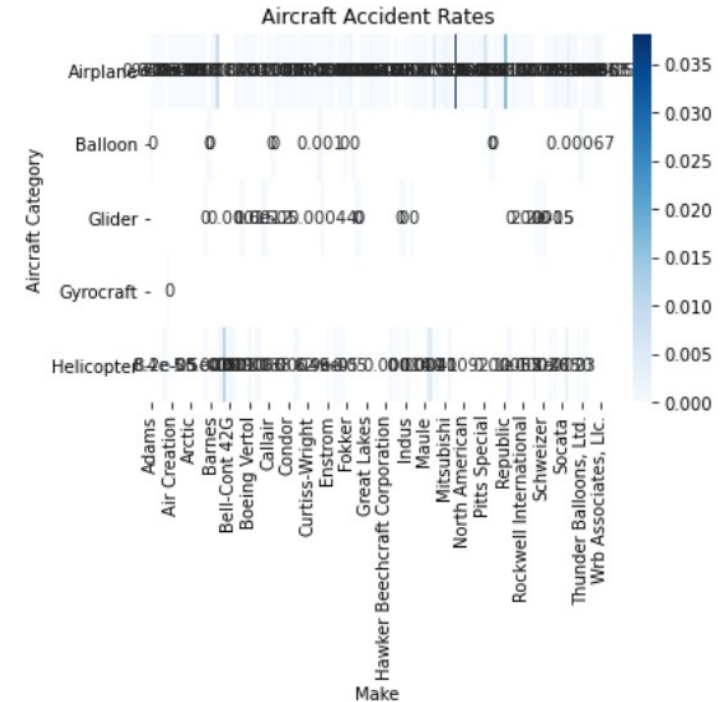
Bellanca and Swearingen have consistently low accident rates.

Airplane category shows a wide range of accident rates among different makes.

Helicopter category has more consistent accident rates, with most makes falling

within a narrow range. Balloon category has limited data, but the existing data

suggests relatively low accident rates.



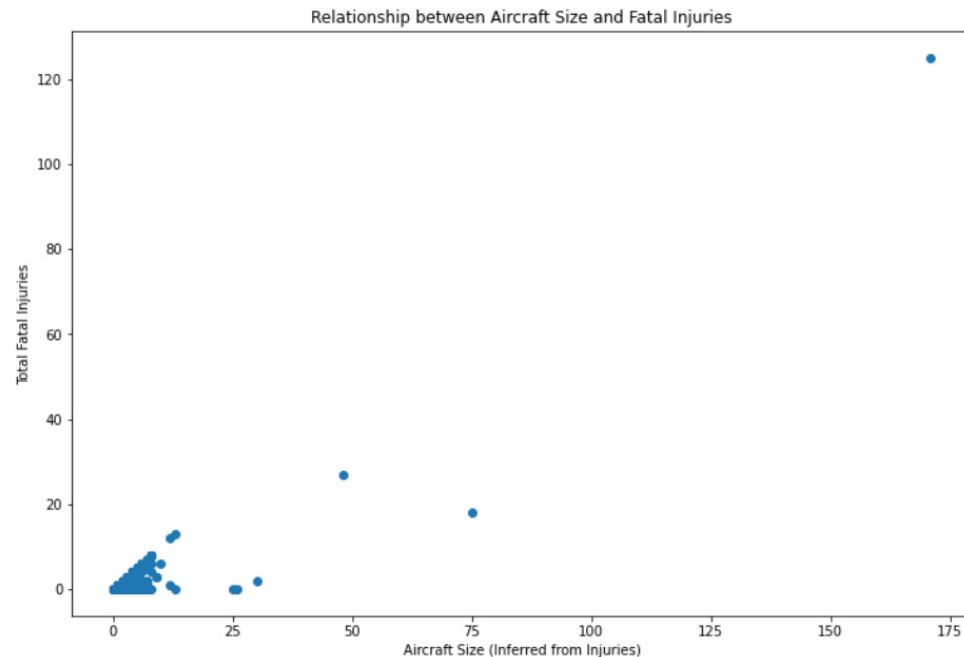
Aircraft Size and Fatal Injuries

- Scatter Plot

The scatter plot shows a strong positive correlation between aircraft size (inferred from injuries) and the number of total fatal injuries. This suggests that larger aircraft tend to have more fatal accidents.

- The correlation coefficient of 0.90 confirms this strong positive relationship. A value close to 1 indicates a strong positive correlation, while a value close to -1 indicates a strong negative correlation. In this case, the high positive correlation

indicates that as aircraft size increases, the number of fatal



Key Insights

- Dominant damage types

Most aircraft have substantial damage.

- Aircraft categories and makes with higher/lower accident rates

Airplane category shows a wide range of accident rates among different makes. Helicopter category has more consistent accident rates, with most makes falling within a narrow range. Balloon category has limited data, but the existing data suggests relatively low accident rates.

Cessna and Piper (makes) have relatively high accident rates across multiple categories. Bellanca and Swearingen have consistently low accident rates.

- Relationship between aircraft size and fatal injuries

The analysis shows that larger aircraft tend to have more fatal accidents.

Recommendations

- I highly recommend Bellanca and Swearingen as they have consistently low accident rates.