AVIATION RISK ASSESSMENT AND AIRCRAFT RISK PREDICTION

Identifying Low-Risk Aircraft for Safe Business Operations

BACKGROUND

Key Points:

- The company is expanding into new industries, including aircraft operations.
- Need to determine the safest aircraft for purchase.
- Identified risks include human error, mechanical failures, environmental risks, and regulatory compliance.

PROBLEM STATEMENT

Key Points:

- Which aircraft models are safest?
- Key risks: aircraft with poor safety records, environmental risks, and amateur-built aircraft.
- How can we mitigate operational inefficiencies caused by these risks?

OBJECTIVES

Key Objectives:

- Identify the lowest-risk aircraft models.
- Determine high-risk locations and weather conditions.
- Evaluate amateur-built aircraft.
- Analyze flight purpose impact on risk.

DATA AND METHODOLOGY

- **Key Points:**

- Data sourced from a Kaggle aviation accident database.
- Focus on variables such as aircraft make/model, weather conditions, geographical locations, injury severity, and purpose of flight.
- Cleaning steps applied to prepare data for analysis.

EXPLORATORY DATA ANALYSIS (EDA)

- **Key Findings:**

- Some aircraft models exhibit higher accident frequencies.
- Weather conditions (e.g., unreported weather) are linked to accidents.
- Personal flights have higher risk compared to commercial or training flights.

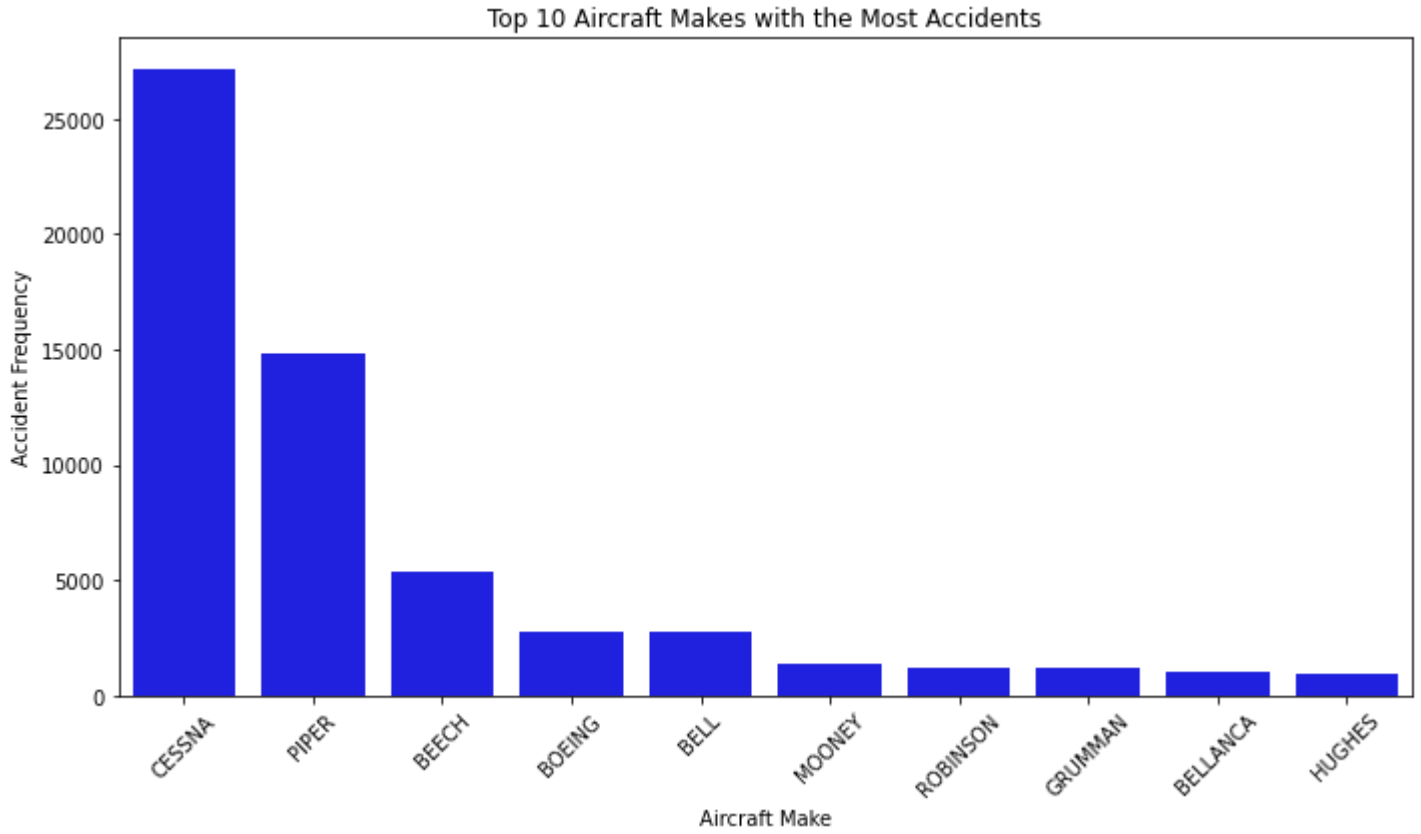
RISK ASSESSMENT

- **Key Points:**

- High-accident frequency for certain aircraft models (Cessna, Piper).
- High severity associated with models like DC-8-62, A320-216.
- Amateur-built aircraft present a higher risk of accidents.
- More accidents occur in good visibility, possibly due to human error.

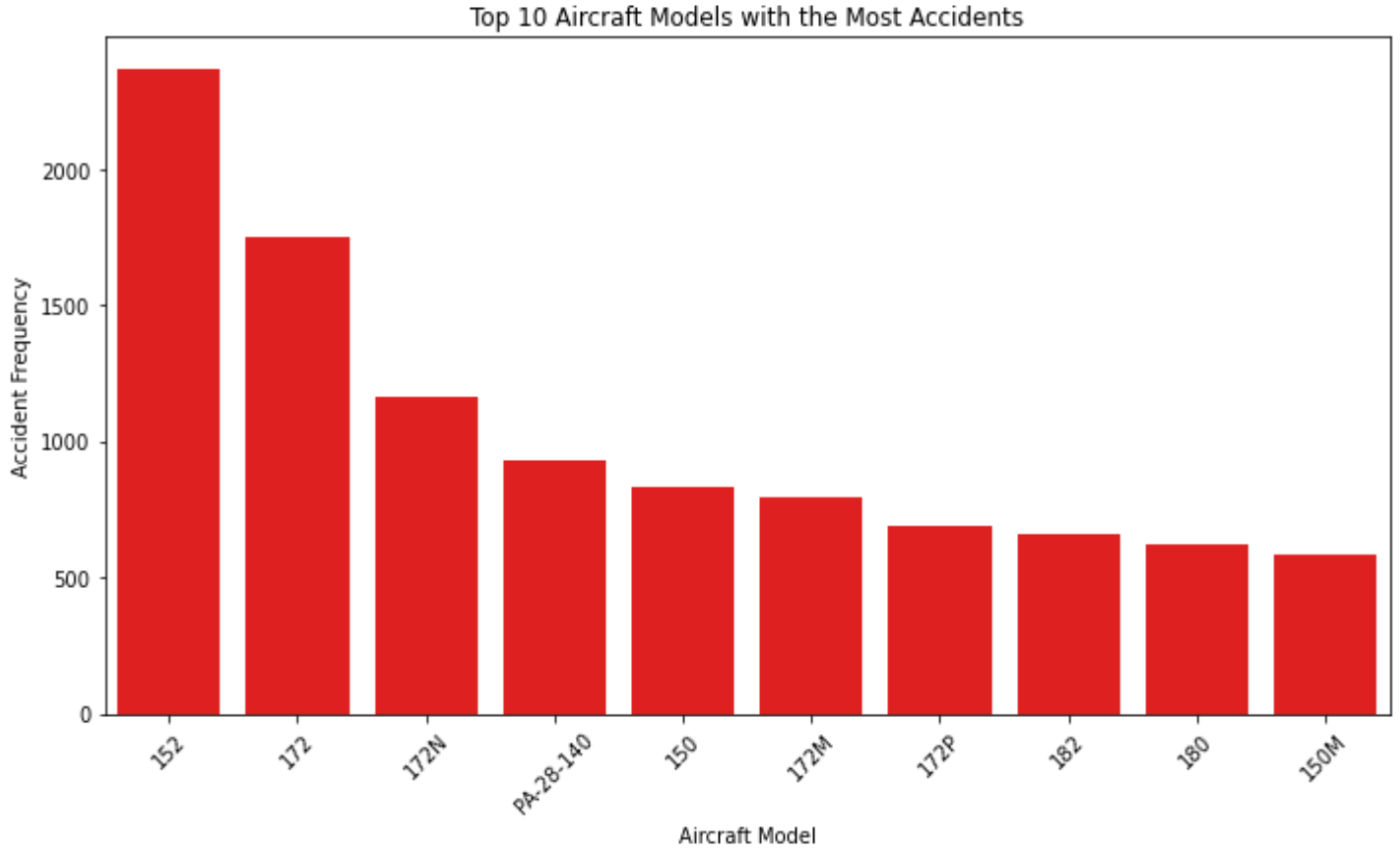
VISUALIZATIONS

- Bar chart showing accident frequencies by make.



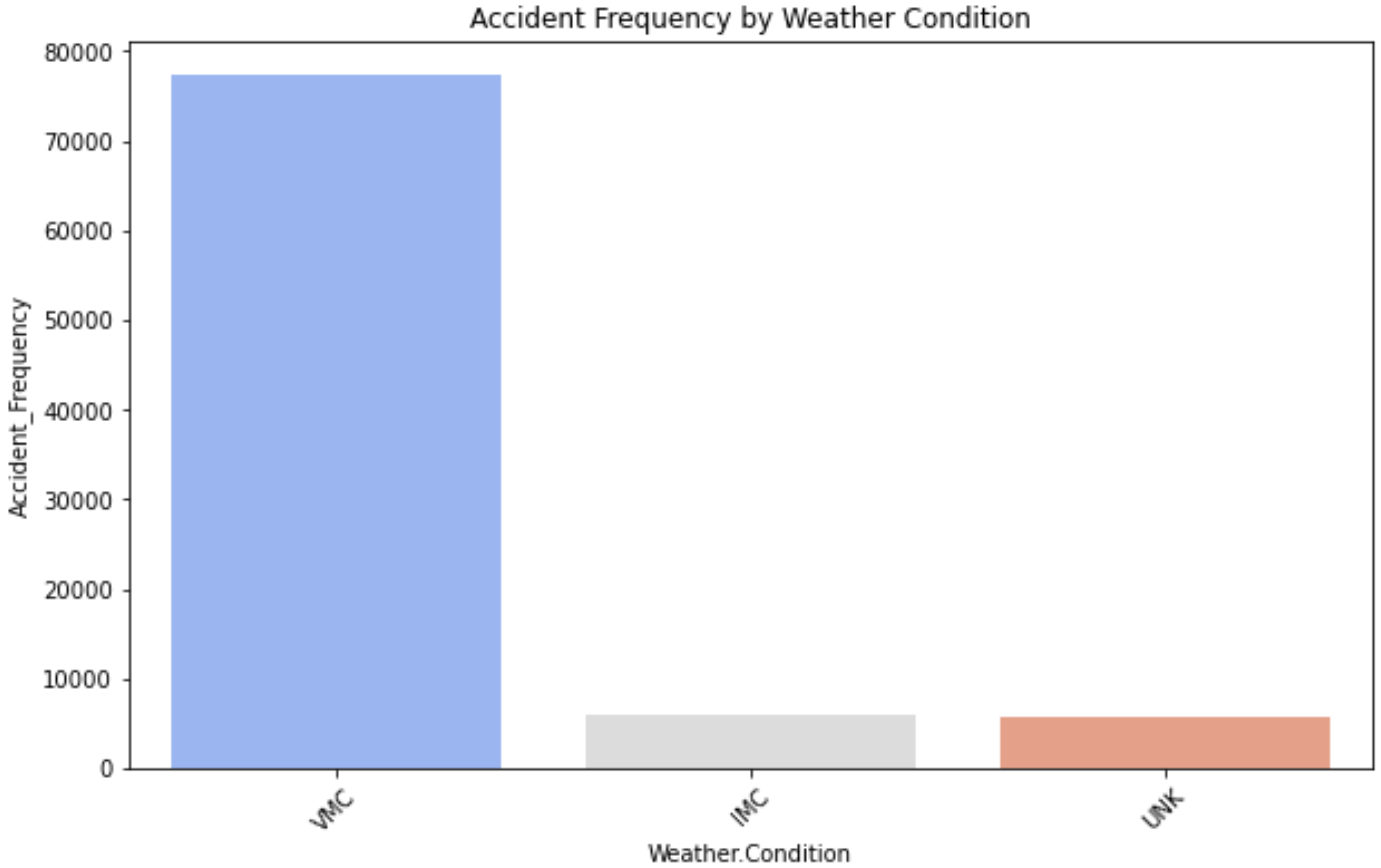
VISUALIZATIONS

- Bar chart showing accident frequencies by model.



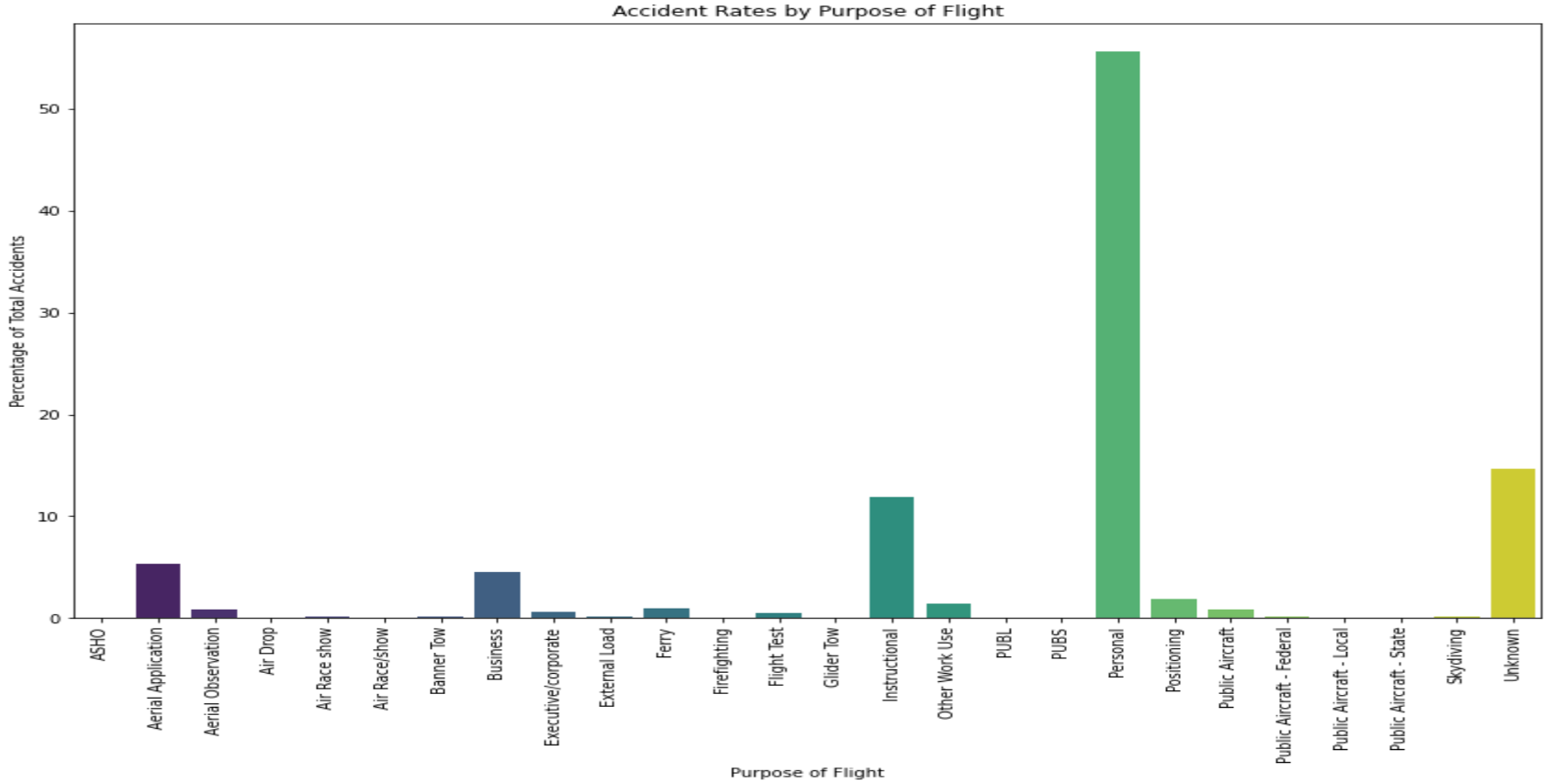
VISUALIZATIONS

- Weather conditions (e.g., vmc) are linked to accidents.



VISUALIZATIONS

- Personal flights have higher risk compared to commercial or training flights.



RECOMMENDATIONS

- **Aircraft Purchase:** Boeing models recommended for their lower risk.
- **Amateur-Built Aircraft:** Avoid investment due to high-risk nature.
- **Operational Insights:** Emphasize the need for instrument usage even in good weather conditions.

CONCLUSION

- **Summary:** Identified safest aircraft models, key risk factors (weather, location, flight purpose), and high-risk areas.

- **Next Steps:** Operational strategy adjustment and procurement planning based on findings.