Aircraft Analysis

Presentation by Claire Njeri

Overview

- This project analyzes aviation accident data to identify aircraft types and conditions associated with the lowest accident risk.
- Using statistical and visual data analysis, the study provides insights to guide the aviation division in enhancing air safety and optimizing resource allocation.

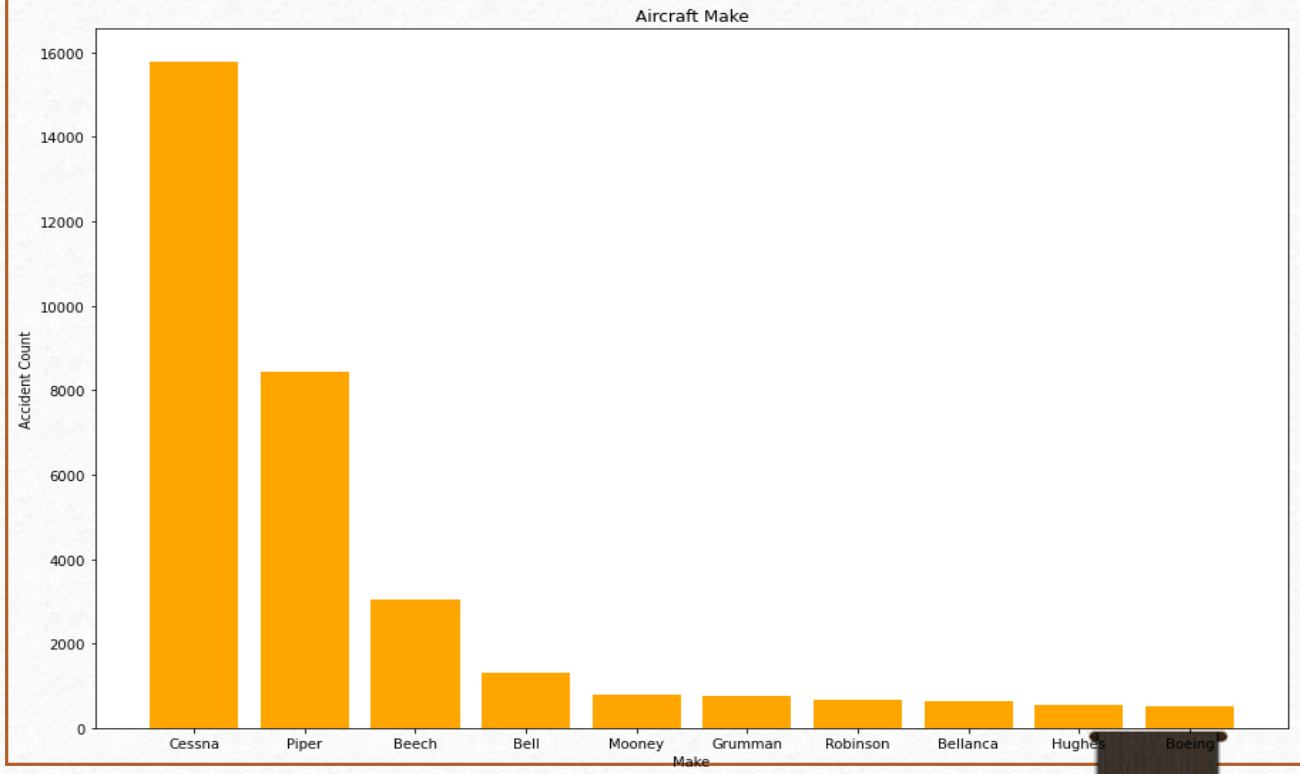
Business Understanding

- The goal is to advise the head of the new aviation division on aircraft with the lowest accident potential.
- Through exploratory data analysis of aviation incident records, the project identifies safety trends by aircraft make, model, engine type, weather, and flight phase, supporting data-driven decisions for fleet acquisition and pilot training.

Data Understanding

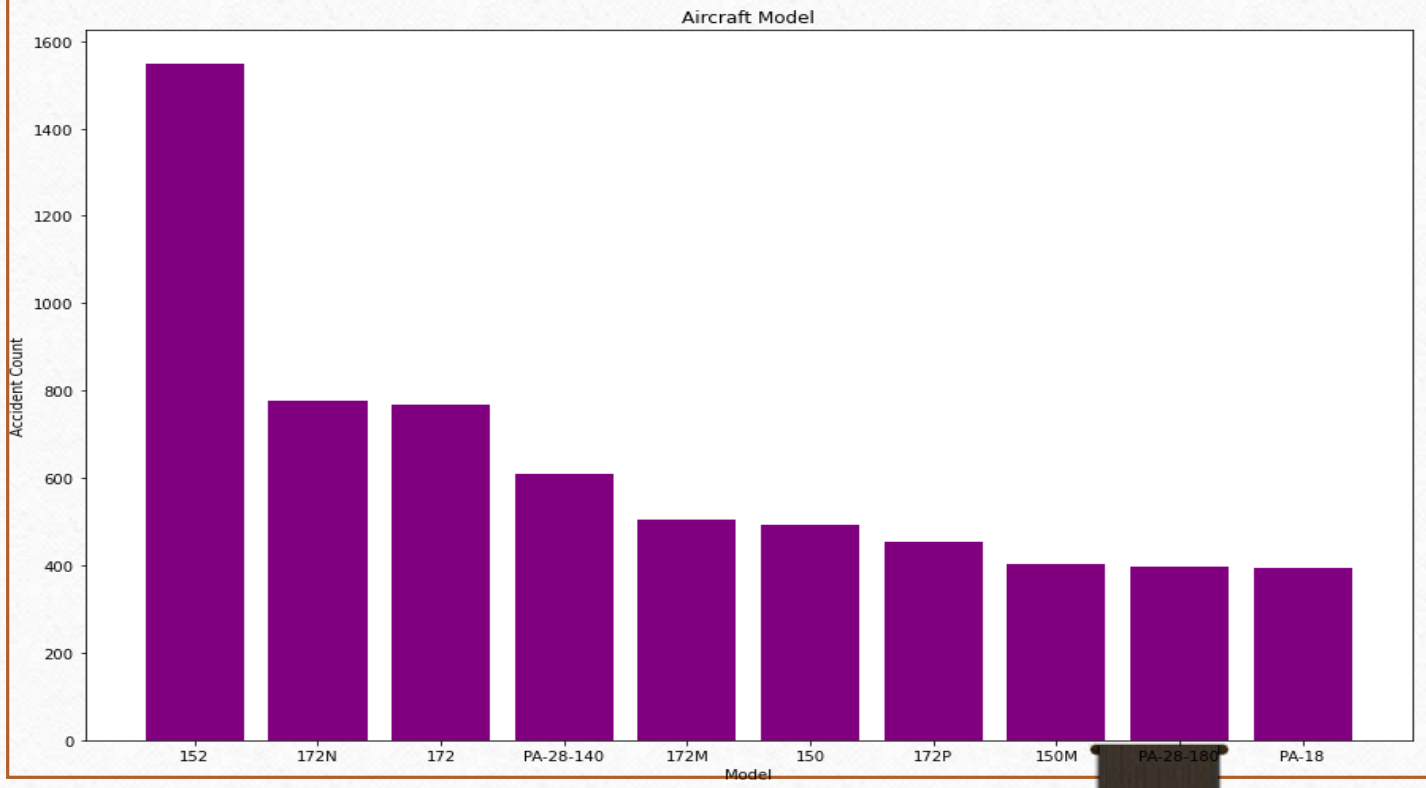
- **Dataset:** Aviation accident data with 90,348 records and 31 variables.
- Checked data shape, types, and completeness.
- Identified missing values (notably in Latitude, Longitude, and Aircraft.Category).
- Removed duplicates (1,390 found and dropped).
- Analyzed continuous (e.g., injuries, engines) and categorical (e.g., make, damage, weather) variables

Data Analysis



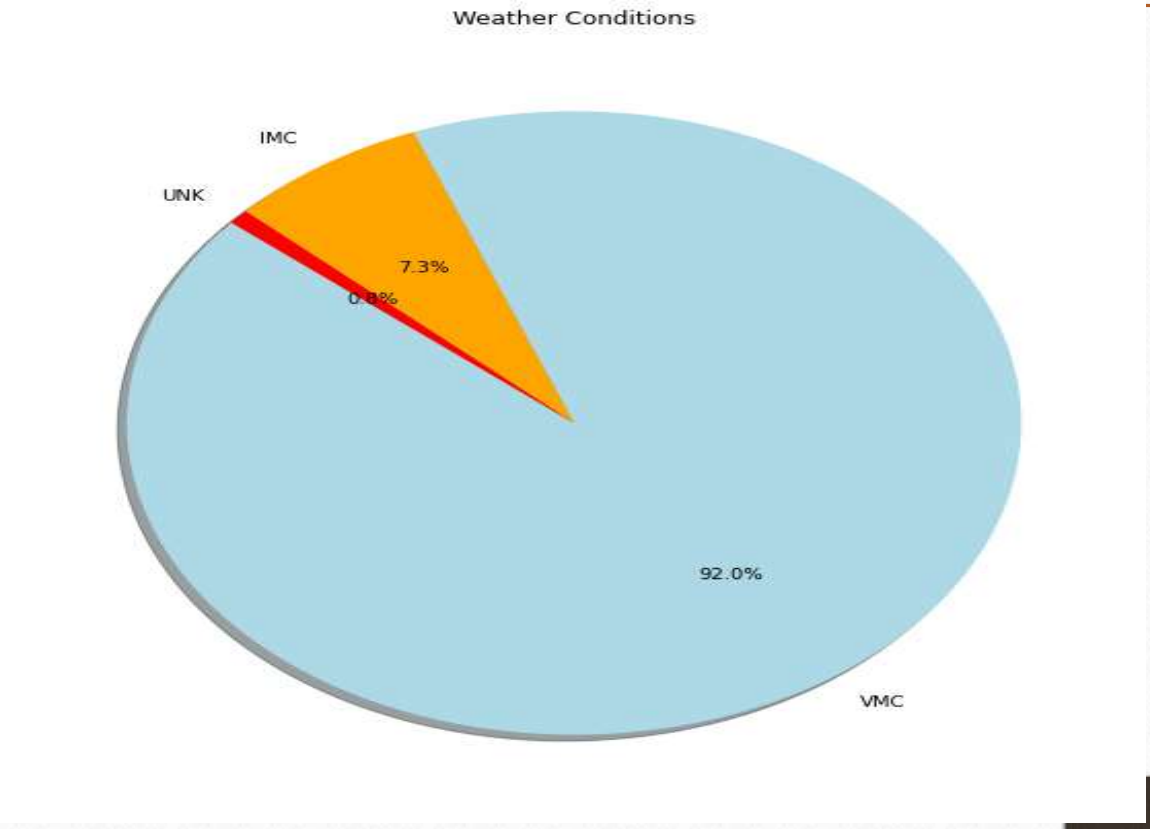
- Cessna, Piper, Beech, and Bell had the most accidents.

Aircraft Model



- Models such as Cessna 152, 150M, PA-28-180, and PA-18 were among the top involved in accidents.

Weather Conditions



- 92% of accidents occurred under VMC (good visibility) conditions.

Recommendations

1. Aircraft Selection: Consider safer makes such as Boeing, Hughes, Bellanca, Robinson, Grumman, and Mooney for acquisition.
2. Model Choice: Prefer models with lower accident rates such as: 150M, PA-28-180, PA-18.
3. Pilot Training: Reinforce training for critical phases (landing, takeoff, maneuvering).
4. Weather Vigilance: Maintain safety protocols even in VMC conditions, as most accidents occur in seemingly “safe” weather.

Next Steps

- Perform predictive modeling to identify risk factors statistically.
- Integrate data from maintenance logs and pilot experience for deeper insights.
- Develop dashboards for ongoing safety monitoring and reporting.

Thank you

For further enquiries, on the analysis reach me out through:

Claire Njeri Nduhiu

GitHub