Risk Assessment of Aircraft for Commercial and Private Enterprises

A Data-Driven Approach to Selecting the Safest Aircraft

NAME: Jesicah Mwikali Mutiso

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Introduction & Project Overview

- **Problem Statement:** The company wants to venture into the aviation industry but needs to identify the lowest risk aircraft models for operation in both commercial and private sector.

- The **GOAL** for this project was to determine low-risk aircrafts for KCOMP company for commercial and private enterprises.

- **Data Source**: Aviation incident and accident data from historical records

Suggested Tools for Visualization

matplotlib or seaborn for most static charts (bar charts, line charts).

Plotly for interactive charts, especially for geographical data

Data Overview

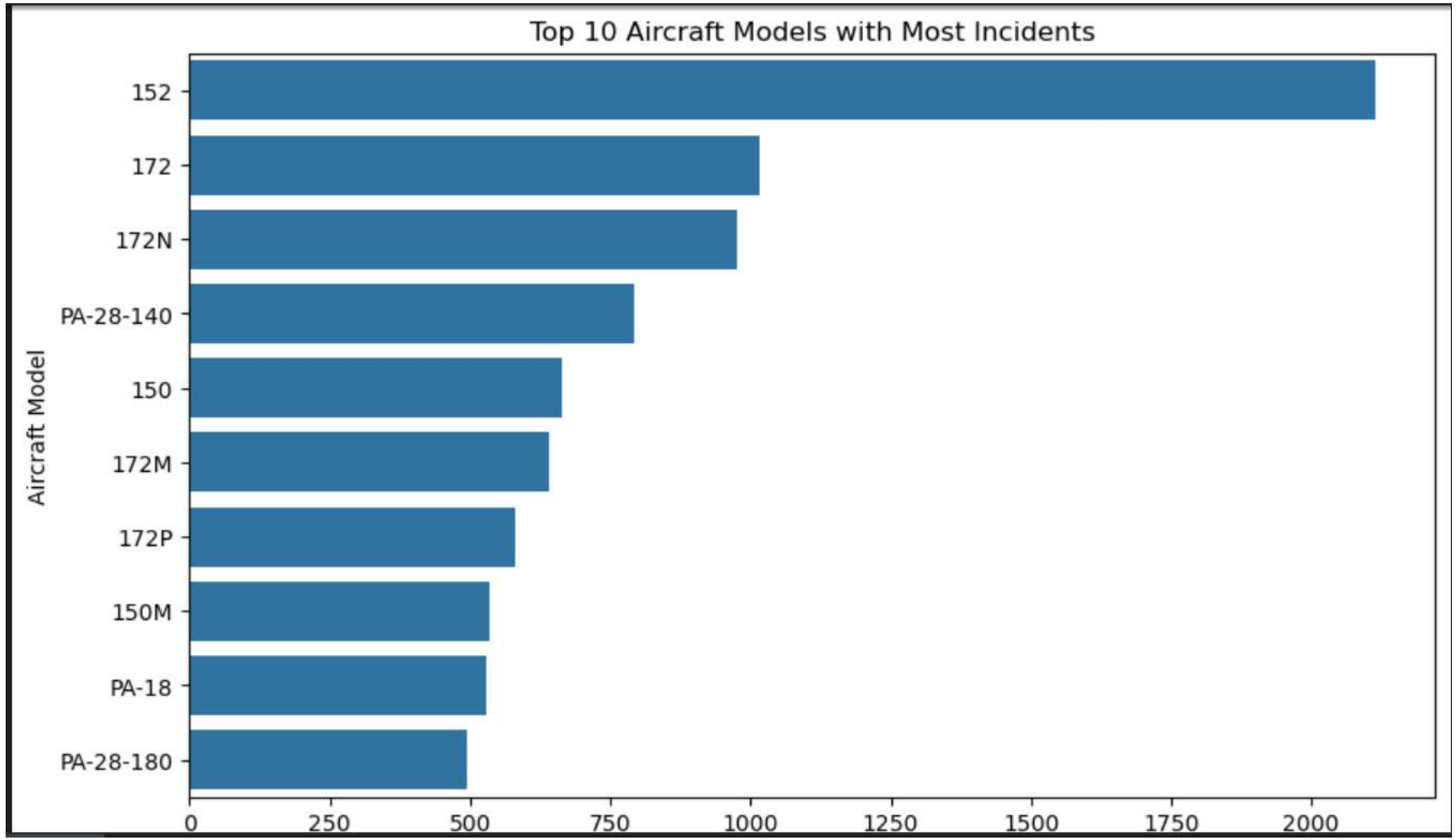
- **Dataset**: AviationData.csv
- **Key Variables**:
- Aircraft Model
- Total Fatal Injuries
- Total Serious Injuries
- Purpose of Flight
- Weather Condition
- Phase of Flight
- **Data Cleaning**: Handling missing values, correcting data types, removing outliers.

Aircraft Incident Analysis

- **Objective**: Identifying which aircraft models have the most incidents and accidents.
- **Visualization**:

  Bar chart showing Top 10 Aircraft Models with Most Incidents.

Key Insight: Highlighting any models that stand out as having significantly higher or lower accident rates.


Top 10 Aircraft Models with Most Incidents
Aircraft Model
152
172
172N
PA-28-140
150
172M
172P
150M
PA-18
PA-28-180
0
250
500
750
1000
1250
1500
1750
2000

Severity of Accidents

- **Object:**the severity of accidents across different aircraft models (fatal vs. non-fatal).
- **Visualization**:

  Stacked bar chart showing **Fatal vs Non-Fatal Accidents by Aircraft Model**.

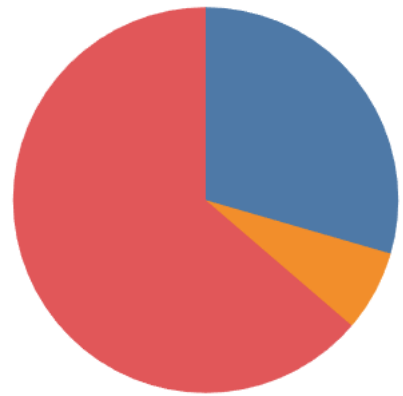
- **Key Insight**: Discuss which aircraft models are more prone to fatal accidents and why that might be a risk factor.

Incidents by Flight Phase

- **Objective**: Identify during which phase of flight (e.g., takeoff, cruise, landing) most accidents occur.

- **Visualization**:
  - Pie chart or bar chart showing **Accidents by Phase of Flight**.

- **Key Insight**: Highlight which phases are most dangerous, and discuss any safety measures or aircraft that perform better during critical phases.



Summary of Key Insights

- Most Reliable Aircraft Models: LM 1, LLC, LL-8-F, LL-8-C, &GCBC,LOGANAIR I
- LOEHLE AVIATION 5151
- LM-1
- LM 2
- High-Risk Models: 152, 172, 172N,PA-28-140,150,172M,172P,172P,150M,PA-18,PA-28-180
- Operational Considerations: Which aircraft are better suited for specific types of operations (e.g., private vs. commercial)

- Environmental Factors: weather and geography influence accident risks.

Actionable Recommendations

- Aircraft Selection: Recommend low-risk models for purchase
- LM 1, LLC, LL-8-F, LL-8-C
- &GCBC
- LOGANAIR I
- LOEHLE AVIATION 5151
- LM-1
- LM 2
- Maintenance and Safety: Suggest investing in maintenance and pilot training for models with mechanical failure or operational risks.
- Strategic Focus: Tailor operations based on environmental risks (e.g., avoiding certain regions or flying in adverse weather).