Aviation Risk Analysis
Data-Driven Aircraft Investment Strategy

Phase 1 Data Science Project

By: **Stephen Munene Gachingu**

LinkedIn: https://www.linkedin.com/in/stephen-gachingu-942633276/

Project Overview

- ❖ Help the company choose safe aircraft to invest in

- ❖ Used accident data from 1962 to 2023

- ❖ Cleaned, analyzed, and visualized real-world data

- ❖ Made 3 clear business recommendations

Business Goal

- Company expanding into aviation
- Leadership needs to understand accident risks
- Goal: Recommend aircraft types with low risk
- Result: Enable smart investment decisions

About the Dataset

❖ **Source:** National Transportation Safety Board (NTSB)

❖ Covers aviation accidents from 1962–2023

❖ Includes: aircraft type, manufacturer, damage, injuries, purpose, date, location

TOP 10 MANUFACTURERS BY NUMBER OF ACCIDENTS

Top 10 Aircraft Manufacturers by Number of Accidents
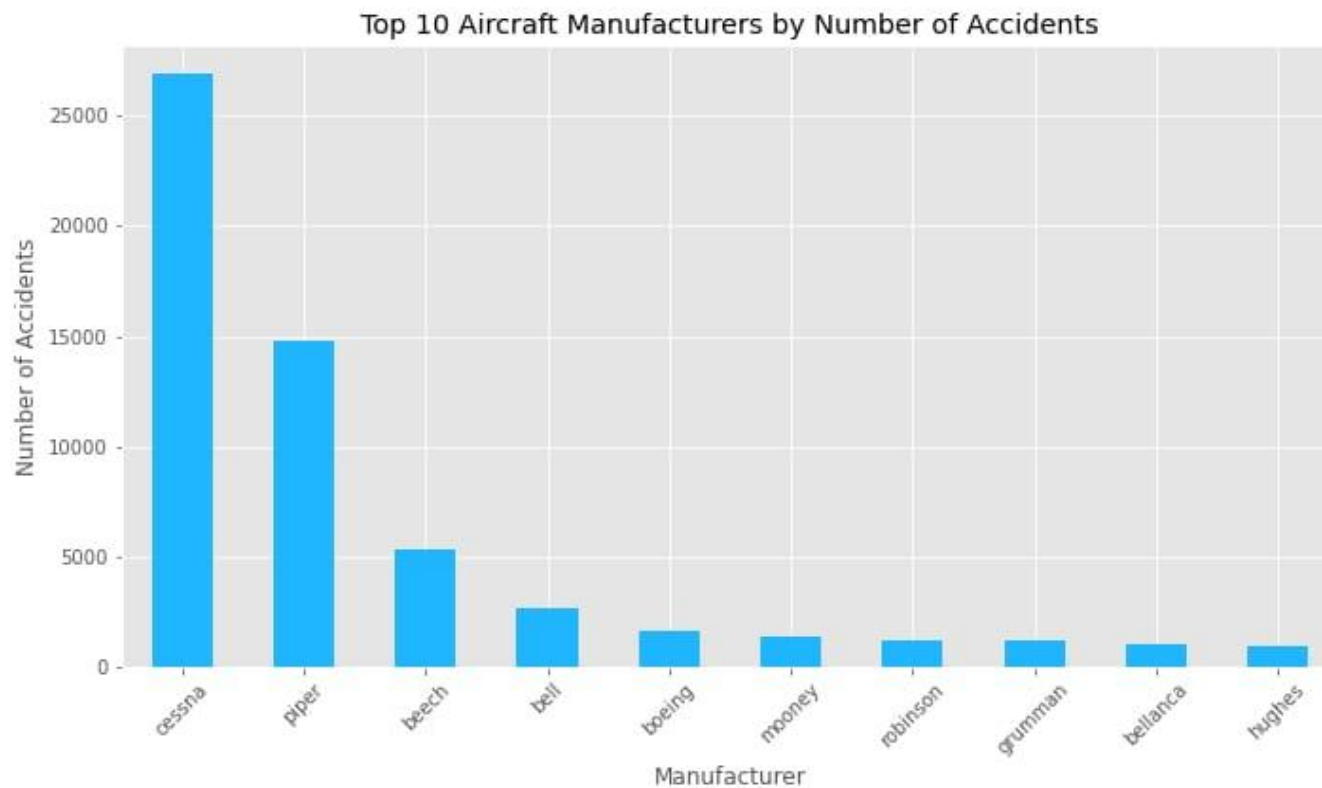
TOP 10 MANUFACTURERS BY NUMBER OF ACCIDENTS

❖ **Insight:** A few manufacturers dominate accident frequency.

❖ **Recommendation:** Prioritize aircraft from manufacturers with lower historical accident counts, and approach high-incident brands like [Top 2 from chart] with caution.

❖ **Business Value:** Enables smarter sourcing of safer aircraft brands.

Aircraft Safety Score

Aircraft Models with Highest Average Safety Risk Score
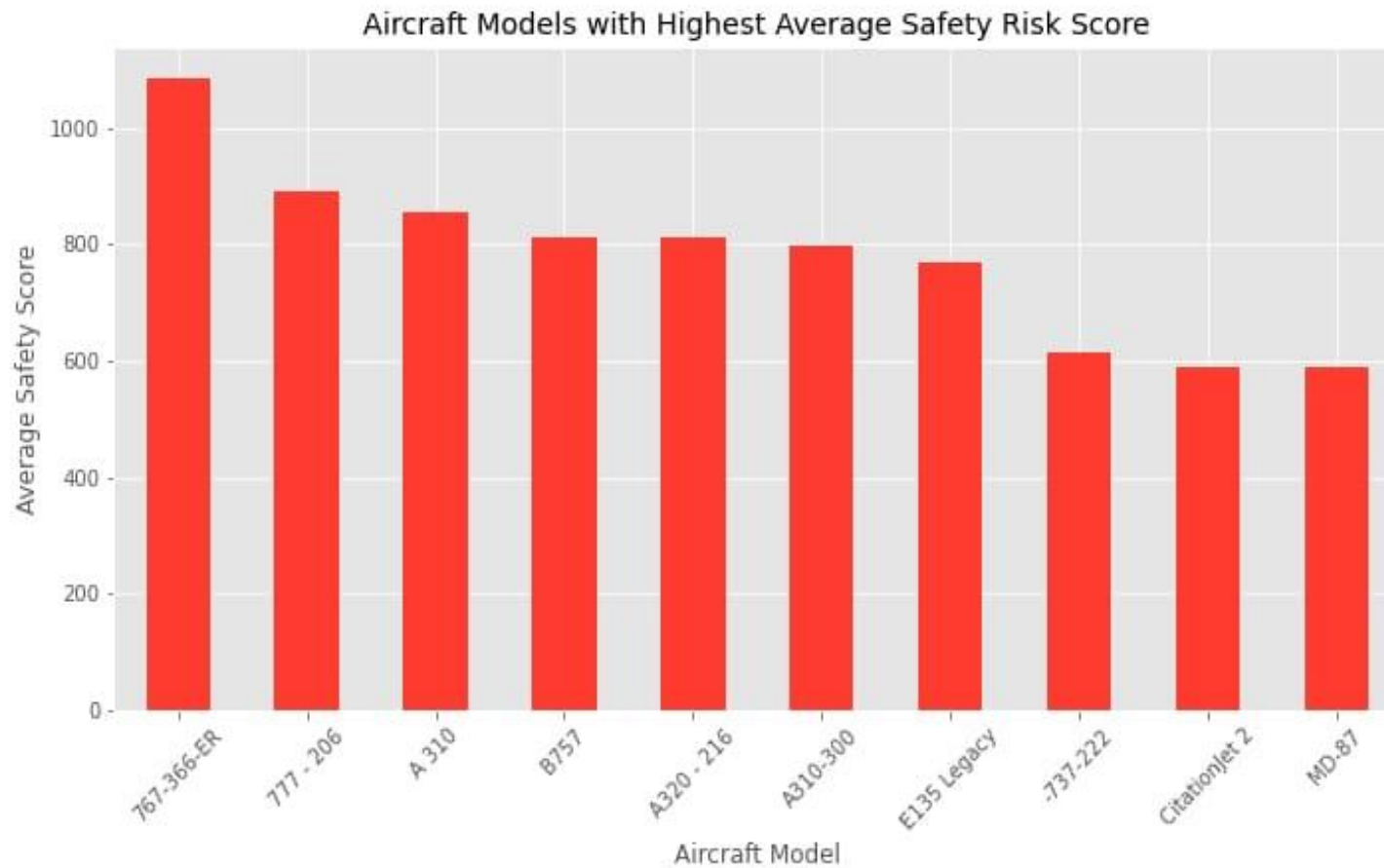
Aircraft Safety Score

❖ **Insight:** Some aircraft models repeatedly show high fatality and injury rates based on the safety score.

❖ **Recommendation:** Avoid investing in aircraft models with high safety scores, such as [Top 1–2 models from our chart], which show higher average fatal and serious injuries per incident.

❖ **Business Value:** Reduces risk exposure and liability.

Risk by Purpose of Flight
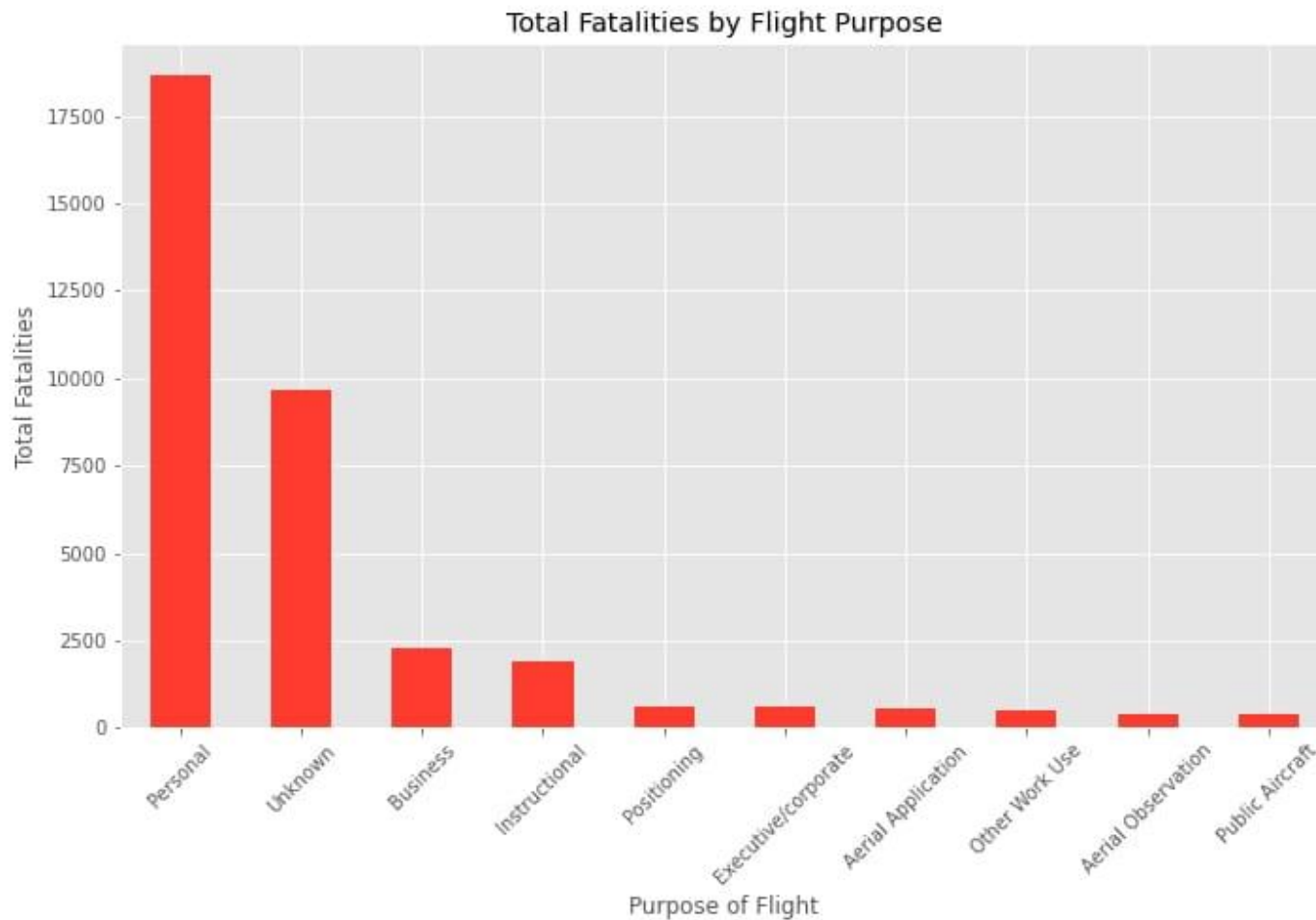
Risk by Purpose of Flight

- ❖ **Insight:** Personal and instructional flights contribute significantly to fatal injuries compared to commercial flights.

- ❖ **Recommendation:** Focus initial investments on aircraft for commercial use, where safety regulations and oversight tend to be stricter. Avoid targeting markets dominated by personal/recreational aviation during the early expansion phase.

- ❖ **Business Value:** Improves risk control in early adoption phase.

Key Business Recommendations

❖ 1. Avoid high-risk aircraft models (e.g., [767-366-ER], [777-2016],[A 310],[B757])

❖ 2. Prefer manufacturers with fewer historical accidents

❖ 3. Focus on commercial-use aircraft initially

What's Next?

❖ Build a live dashboard to track safety

❖ Analyze seasonal/regional accident trends

❖ Explore cost vs. safety trade-offs

THE END

For more information/ Inquiries
Contact Us:

❖ LinkedIn:
https://www.linkedin.com/in/stephen-gachingu-942633276/

❖ GitHub:
https://github.com/GACHINGU