AIRCRAFT RISK ANALYSIS

OUTLINE

1. Overview
2. Business Understanding
3. Data Understanding
4. Data Analysis
5. Conclusion
6. Recommendations
7. Next steps

OVERVIEW

Let’s start with the first segment of outline

OVERVIEW

- Project analyzes aviation accident data (1962–2023) from the NTSB.
- Business driver: company expanding into the aviation industry.
- Key stakeholders: executives, Aviation Division head, data science team.
- Context: safety is critical in aviation for reputation, customer trust, and compliance.

BUSINESS UNDERSTANDING

Let’s proceed to the second segment of outline

2

BUSINESS UNDERSTANDING

Problem Statement

- The company plans to expand into the aviation industry but faces uncertainty in selecting safe and reliable aircraft. Without a data-driven evaluation of accident risks across manufacturers, models, and flight types, there is a danger of costly investments, reputational harm, and safety concerns. Analyzing historical accident data is therefore critical to guide safe and informed purchase decisions.

BUSINESS UNDERSTANDING

Objectives:

- Assess historical aircraft accident trends (1962–2023).
- Identify aircraft types and manufacturers with the lowest risks.
- Provide actionable, data-driven recommendations for purchase decisions.

DATA UNDERSTANDING

Let’s proceed to the third segment of outline

3

DATA UNDERSTANDING

- SOURCE

National Transportation Safety Board (NTSB) Aviation Accident Database

- COVERAGE

1962 – 2023 (61 years of data)

- RELEVANCE

Provides a comprehensive historical record of aviation safety.

- DIMENSION
- 90348 rows and 31 columns

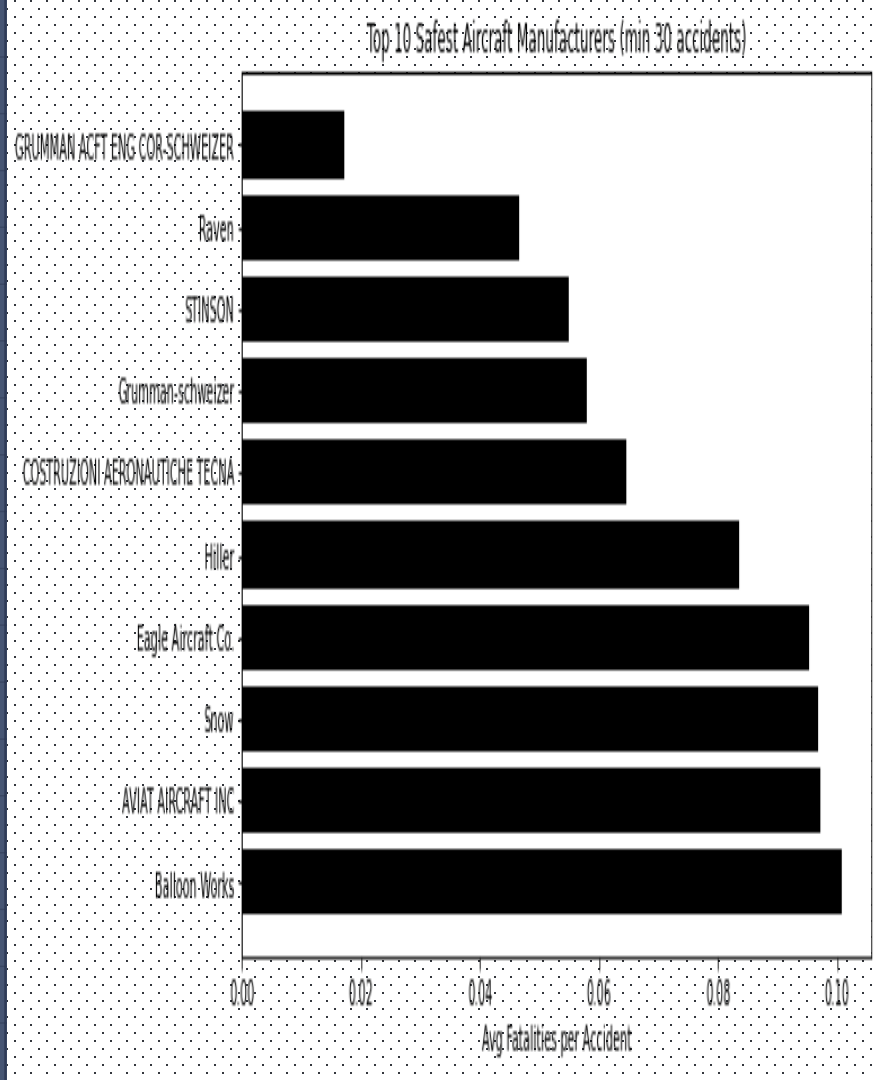
DATA ANALYSIS

Let’s proceed to the fourth segment of outline

4

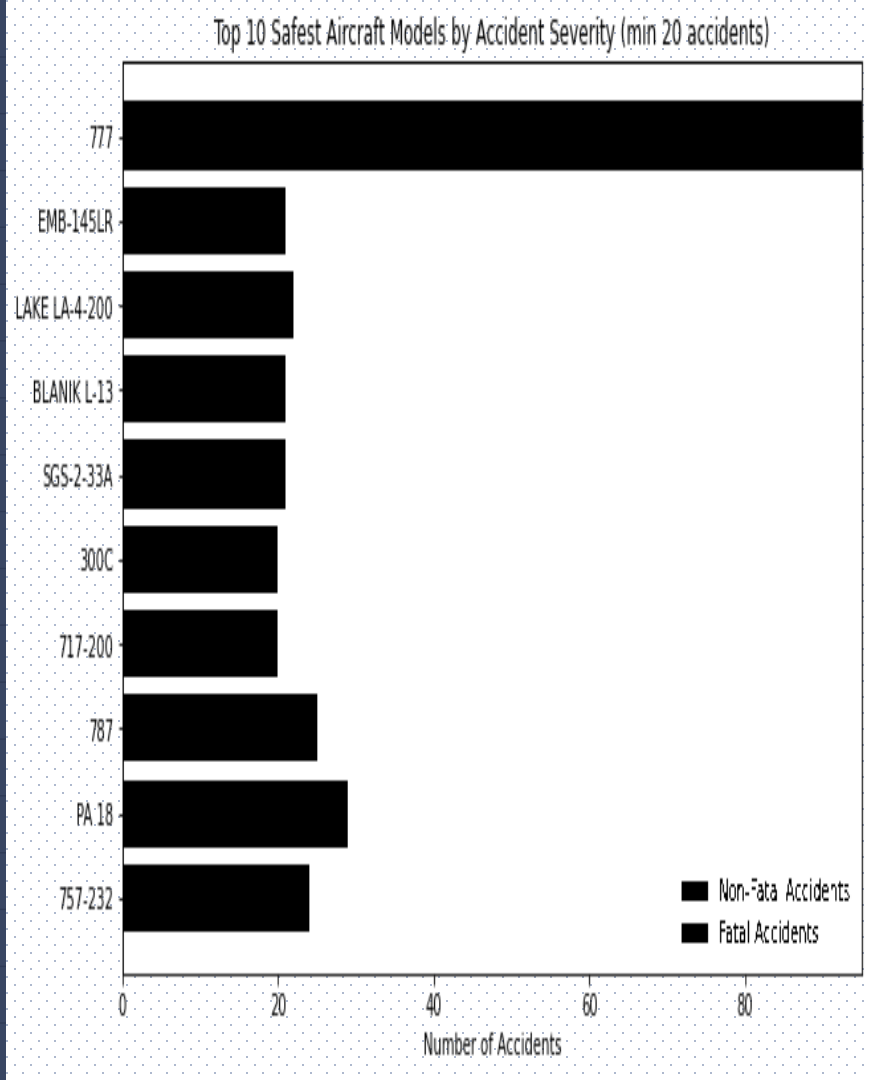
SAFEST MANUFACTURERS

- Manufacturers like **Grumman-Schweizer, Raven, and Stinson** show consistently low accident severity.
- These manufacturers stand out as safer options compared to others.



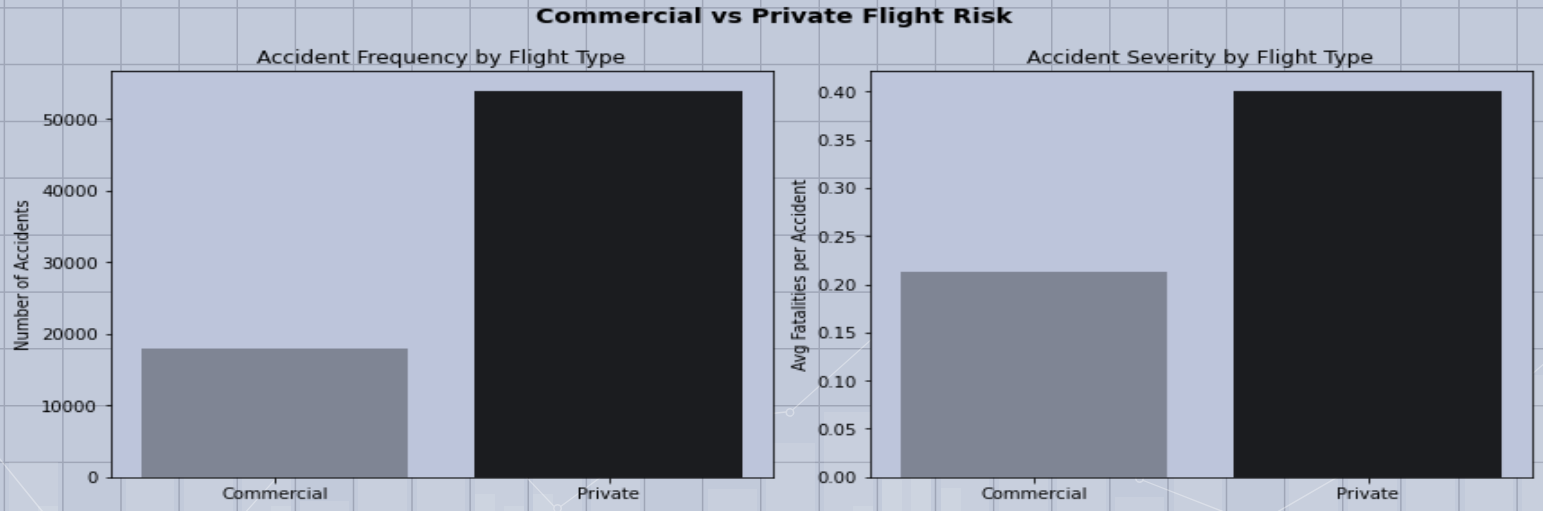
SAFEST AIRCRAFT MODELS

- Models such as **Boeing 777, EMB-145LR, and Boeing 757-232** recorded **zero fatal accidents**, despite multiple incidents.
- This highlights their strong safety track record.



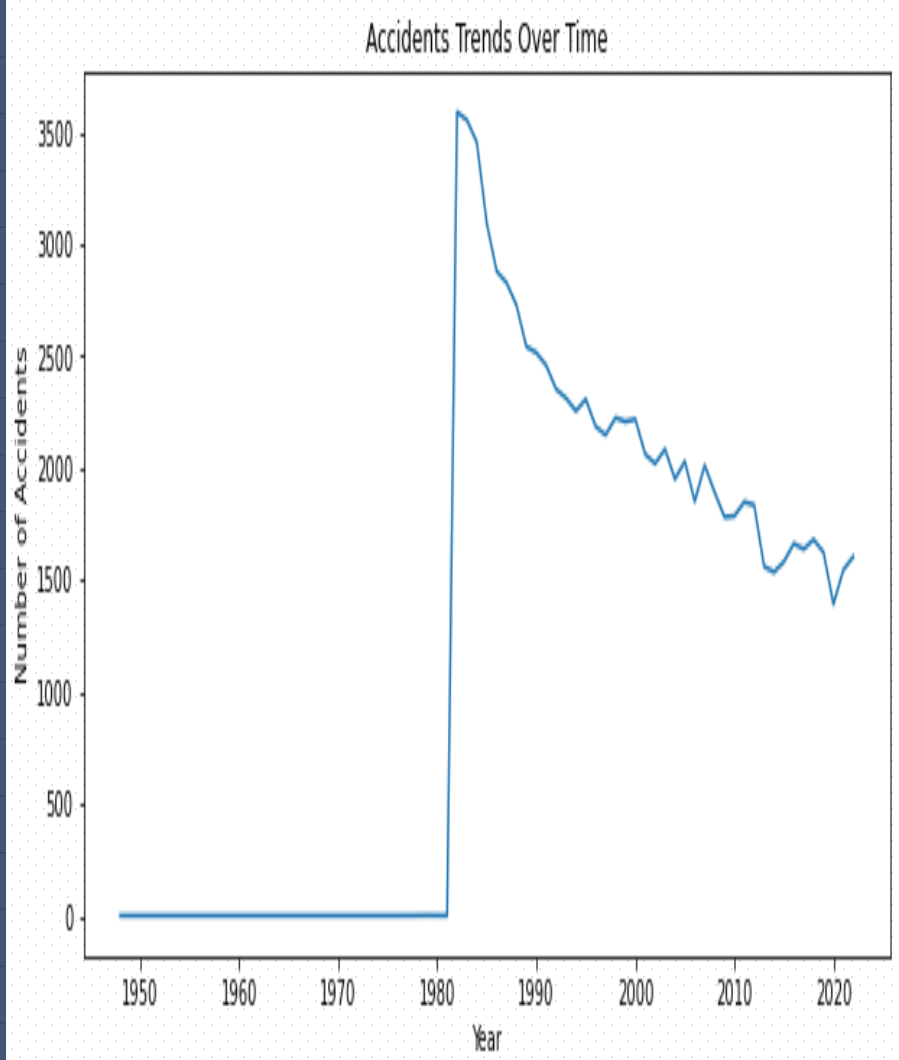
COMMERCIAL VS PRIVATE AVIATION

- **Commercial flights:** Lower accident frequency and severity.
- **Private flights:** Higher accident rates and more severe outcomes.
- Commercial aviation presents lower operational risk for expansion.



ACCIDENT TRENDS OVER TIME

- Accident numbers **peaked in the 1980s** but have steadily **declined since then.**
- Reflects improvements in technology, regulations, and training.



CONCLUSION

- Aviation safety has **improved significantly** over time.
- Certain **manufacturers** (Grumman-Schweizer, Raven, Stinson) and **models** (Boeing 777, EMB-145LR, Boeing 757-232) stand out as the safest options.
- **Commercial aviation** is much safer than private aviation — both in accident frequency and severity.
- Overall, the data strongly suggests focusing on **commercial aviation** with proven safe models for expansion.

RECOMMENDATIONS

Prioritize Commercial Aviation

- Enter the commercial aviation sector first as it presents a lower risk profile.
- Treat private aviation as a **secondary/long-term opportunity** once strong safety protocols are in place.

Select Safe Manufacturers and Models

- Procure aircraft from manufacturers with historically low accident severity (Grumman-Schweizer, Raven, Stinson).
- For commercial operations, focus on proven safe models like **Boeing 777, EMB-145LR, and Boeing 757-232.**

Leverage Safety as a Competitive Advantage

- Use safety track record in **branding, marketing, and stakeholder engagement.**
- Reinforce the company's positioning as a **safety-first aviation operator.**

NEXT STEPS

- **Operational Validation:** Cross-check safety insights with **costs, maintenance, and spare parts availability.**
- **Regional & Regulatory Analysis:** Review safety and regulatory requirements specific to **target regions of operation.**
- **Insurance & Risk Modeling:** Engage insurers to understand **premiums and risk coverage differences** across aircraft options.
- **Expand Data Scope:** Incorporate **post-2023 data** and operational records for ongoing monitoring.

THANKS!

Any questions?

You can find me at

- Email: johomwanaisha8@gmail.com