AIRCRAFT SAFETY ANALYSIS FOR STRATEGIC INVESTMENT

GUIDING AVIATION EXPANSION THROUGH DATA

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PROJECT OVERVIEW

- **Objective:** Support the company's expansion into aviation by identifying **low-risk aircraft** for private and commercial use.
- This presentation uses **public aviation accident data** to generate business-ready safety recommendations.
- Our company is entering the **aviation industry** for both **commercial and private aircraft operations**.
- **Priority is given to practical insights**, **data-driven decision making**, and **minimizing risk**.

BUSINESS UNDERSTANDING

- The company is expanding into **aviation** to diversify its portfolio.

-Leadership needs to understand **which aircraft are safest to operate.**

- A data-backed safety evaluation will guide **purchase and operational decisions**.

DATA UNDERSTANDING

- Source: **FAA Aviation Accident Synopses** (via Kaggle)
- Time span: **1982–2022**
- Total records: ~**80,000 accidents**
- Key fields analyzed:
  - Count of accident occurrence by respective aircraft
  - Aircraft Category
  - Engine type
  - Count of accident occurrence by respective aircraft
  - Accident Trends

DATA ANALYSIS

METHODS AND TOOLS:

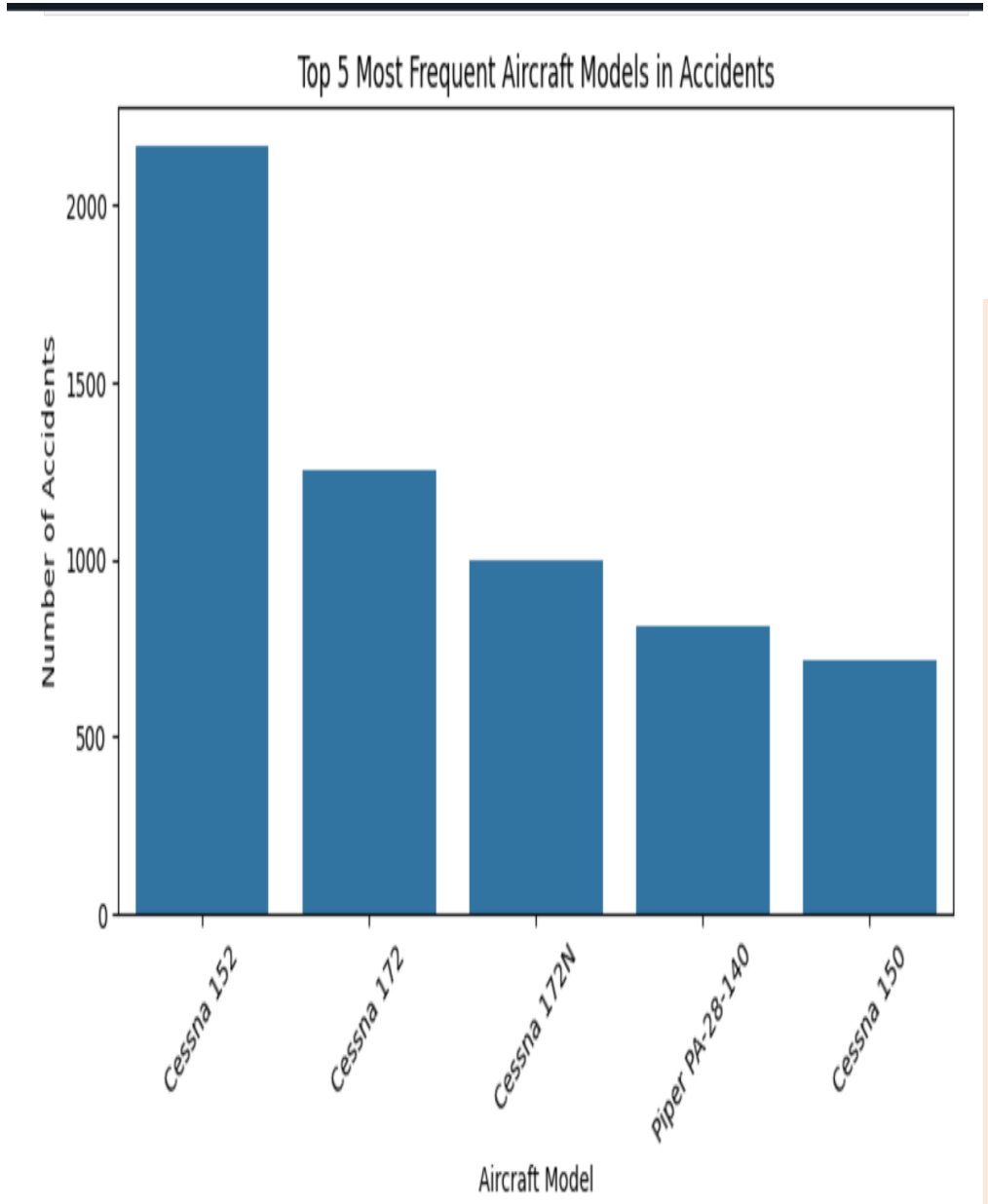
- Used **Python** to clean and analyze data.
- Focused on:
- **Accident frequency** by aircraft type
- **Accident frequency by engine type**
- **Cause patterns**
- Data visualized in **Tableau Public** for clarity

  * Python is a high-level, general-purpose programming language.

  *Tableau is a data visualization and business intelligence tool.

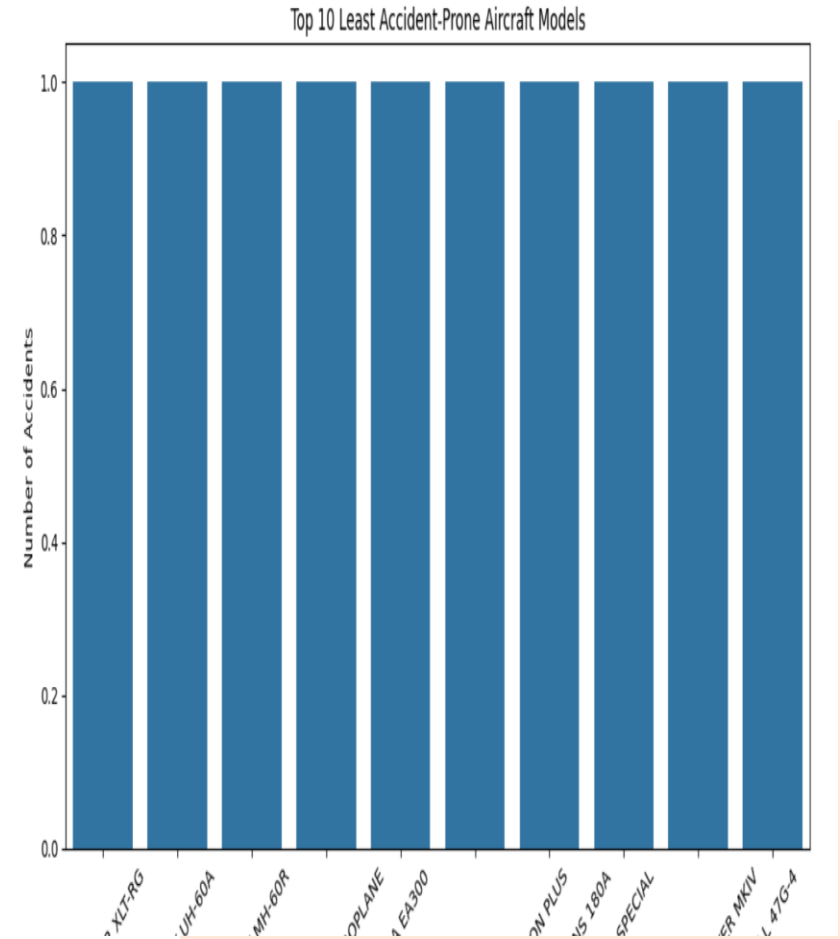
VISUALIZATION 1 – 5 MOST FREQUENTLY INVOLVED AIRCRAFTS IN ACCIDENTS

- This is a bar chart comparing the **number of accidents to the aircraft model.**
- The most prevalent model, in this visualization is the **Cessna model** .
- Clearly, the distribution favors this model as the one that has been most frequently involved in accidents.



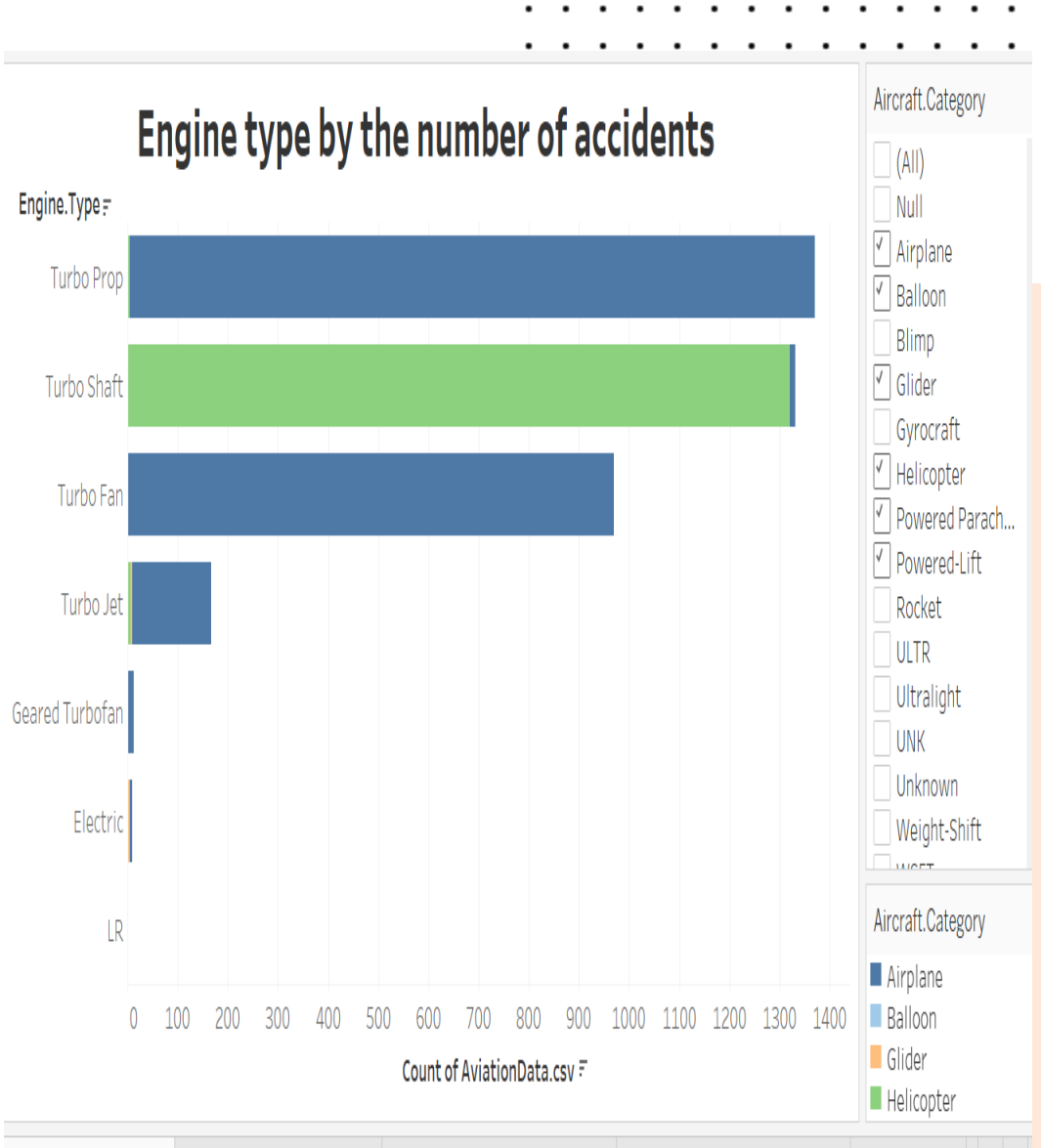
VISUALIZATION 1 – 10 LEAST FREQUENTLY INVOLVED AIRCRAFTS IN ACCIDENTS

- This bar chart compares the **number of accidents to the aircraft model.**
- The **top 5 least accident prone aircraft models?**
  - PITTS Special
  - Extra EA300
  - BELL 47G-4
  - Sikorsky MH-60R
  - Sikorsky UH-60A



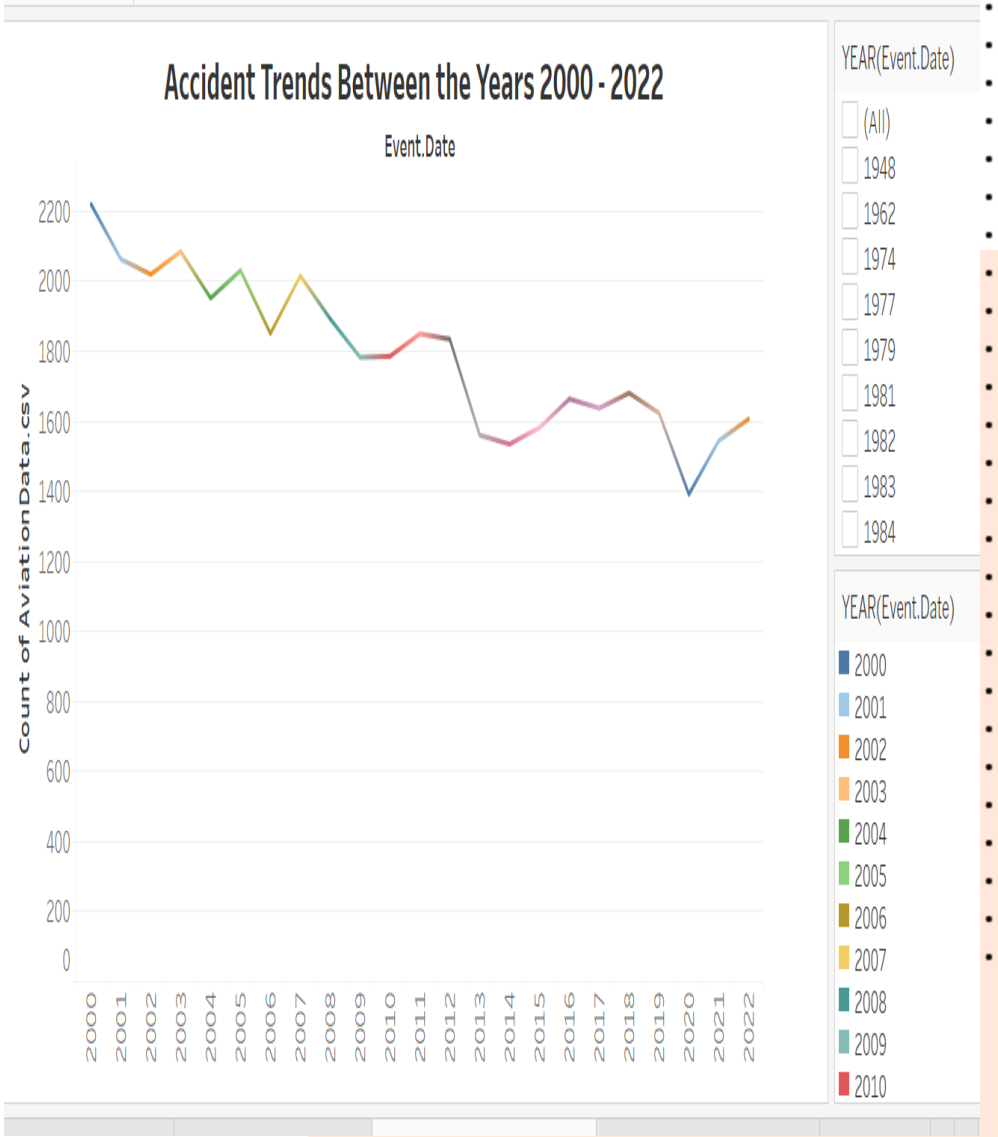
VISUALIZATION 3- ENGINE TYPES IN AIRCRAFTS

- From the bar chat, it is clear that the **engines of the type Turbo** have been **involved in most of the accidents.**
- On the other hand, the **LR and Electric engine** type are the **least involved in accidents.**



VISUALIZATION 4 - ACCIDENT TRENDS BETWEEN THE YEARS 2000-2022

- From the line graph, the highest number of accidents was experienced in the year 2000.
- In the years between 2004 and 2020 there was a decline.
- However, there was an rise in the number of accidents up to 2022.



RECOMMENDATIONS

1. Purchase the **Sikorsky aircraft model(MH-60R, UH-60A)**, for initial purchase because of its effectiveness.
2. Invest in high quality engines like the; Electric and LR engines .
3. Depending on the budget**, the Geared Turbofan** is also a cheaper but dependable engine.

Avoid amateur-built aircrafts despite lower acquisition cost.

NEXT STEPS

1

Present findings to Aviation Division leadership.

2

Conduct cost analysis on recommended aircraft.

3

Develop **safety protocols and pilot hiring standards.**

4

Explore **regulatory compliance** and insurance strategy.


THANK YOU FOR YOUR
ATTENTION AND
COOPERATION