Airline risk analysis for Business Plan

Contents

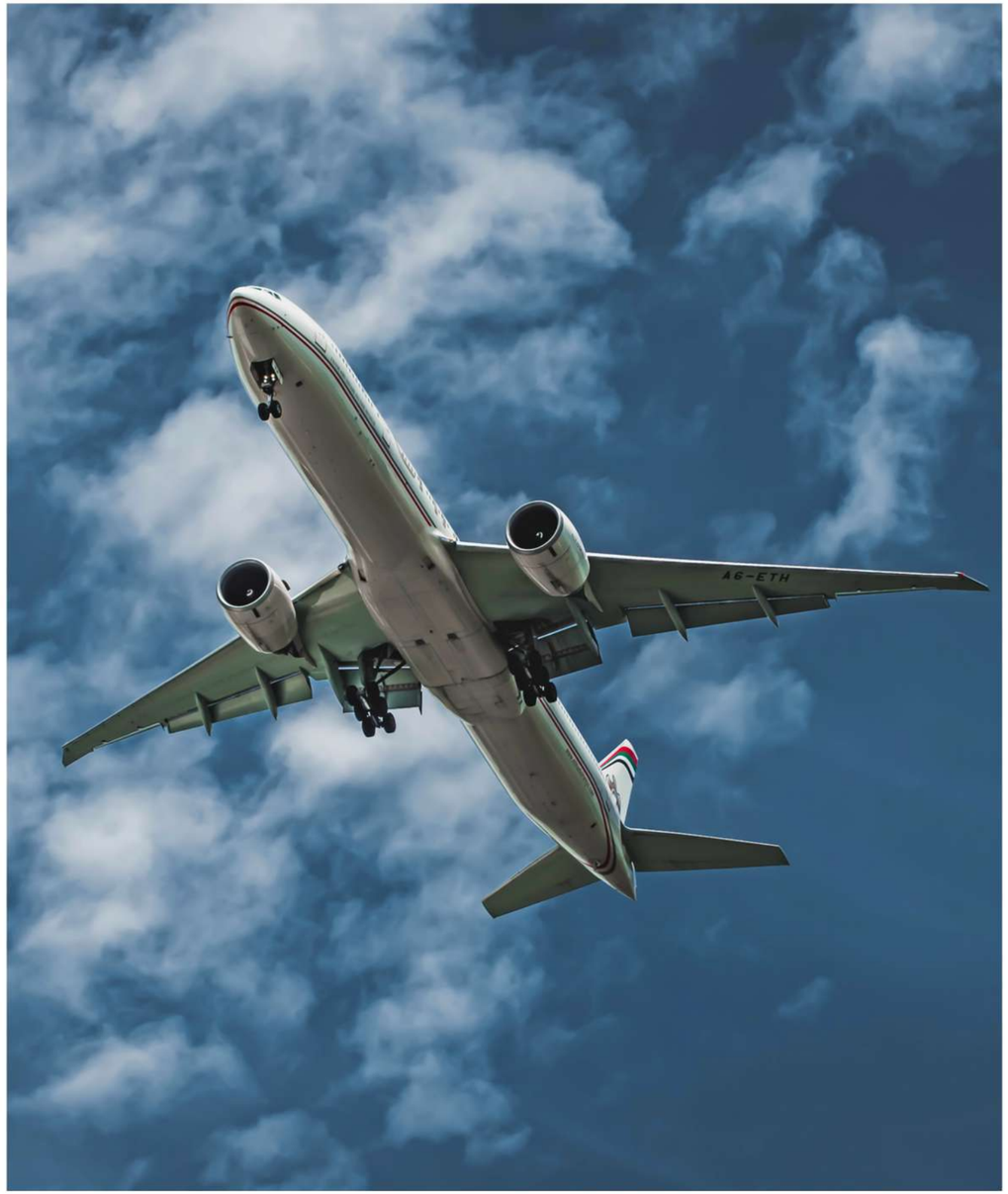
Introduction

Business Understanding

1. The objective of this project is to analyze aviation accident data from the National Transportation Safety Board (NTSB) to provide business recommendations for aircraft purchase.

The company is interested in expanding its fleet and wants to minimize the risk associated with aircraft selection.

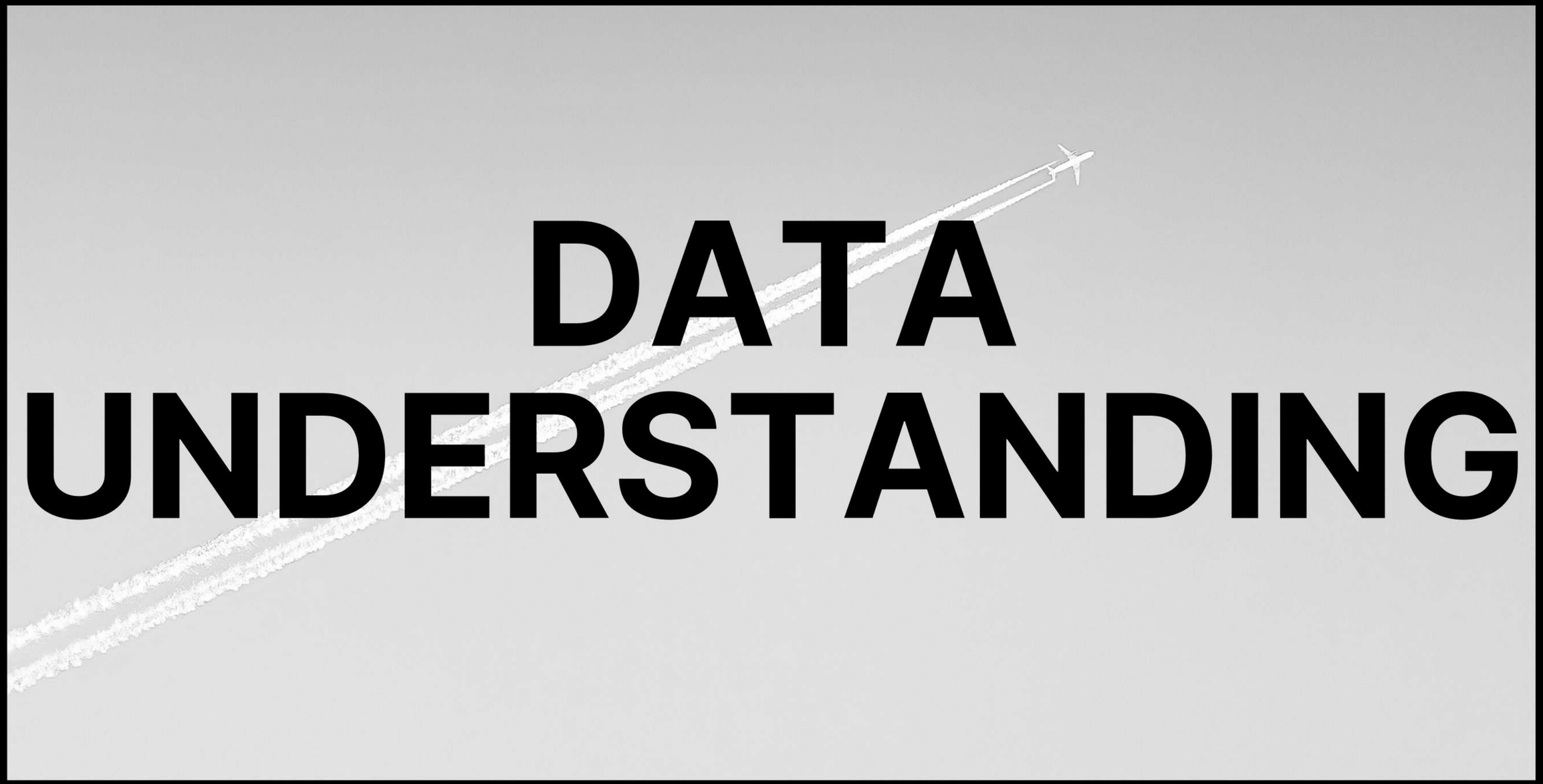
KEY POINTS



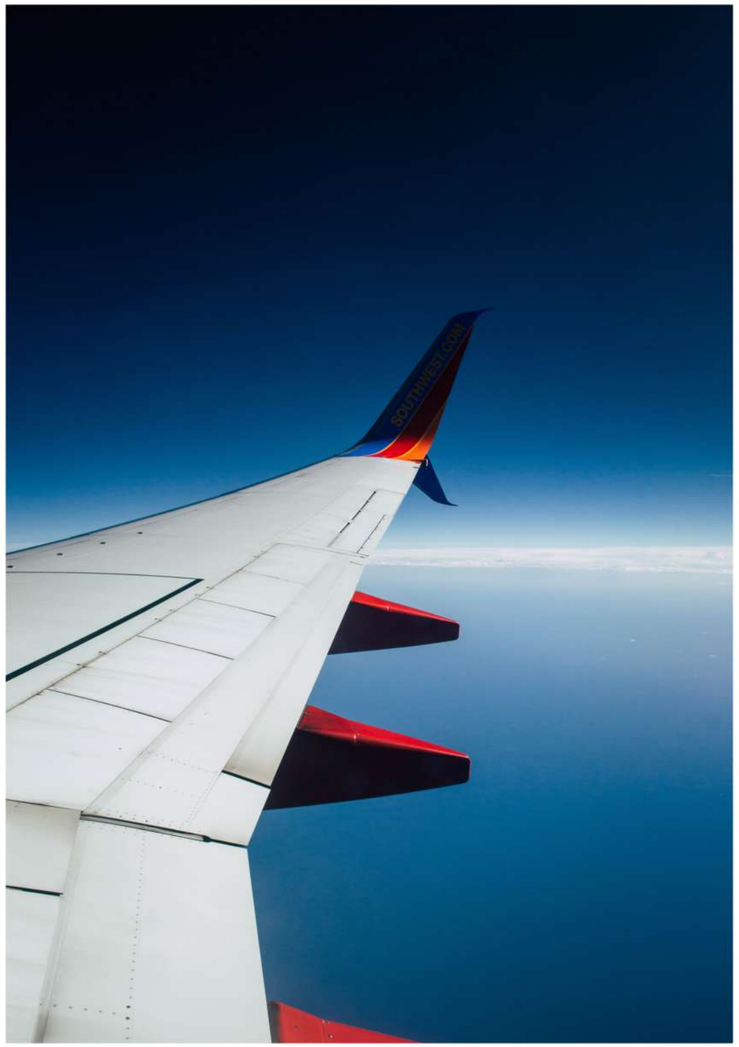
What are the key factors contributing to air accidents ?

Which aircrafts are associated with fewer accidents ?

How can data-driven insights help the company ?


DATA
UNDERSTANDING

DATASET



The dataset used for this analysis contains records of aviation accidents from 1962 to 2023, provided by the NTSB. It includes information on accident details, aircraft types, locations, and other key attributes.

DATA ANALYSIS

- Loading the data to my working area

Key Fields

- Event Date
- Location
- Aircraft Make/Model
- Injury Severity
- Weather Condition
- Purpose of Flight

Data Cleaning

- Select required colums that will help on the insight
- Check and handle missing data replacing missing values with “unknown” or “0”
- Check on duplicates to avoid redundancy

DATA ANALYSIS

Analyse data to find insights

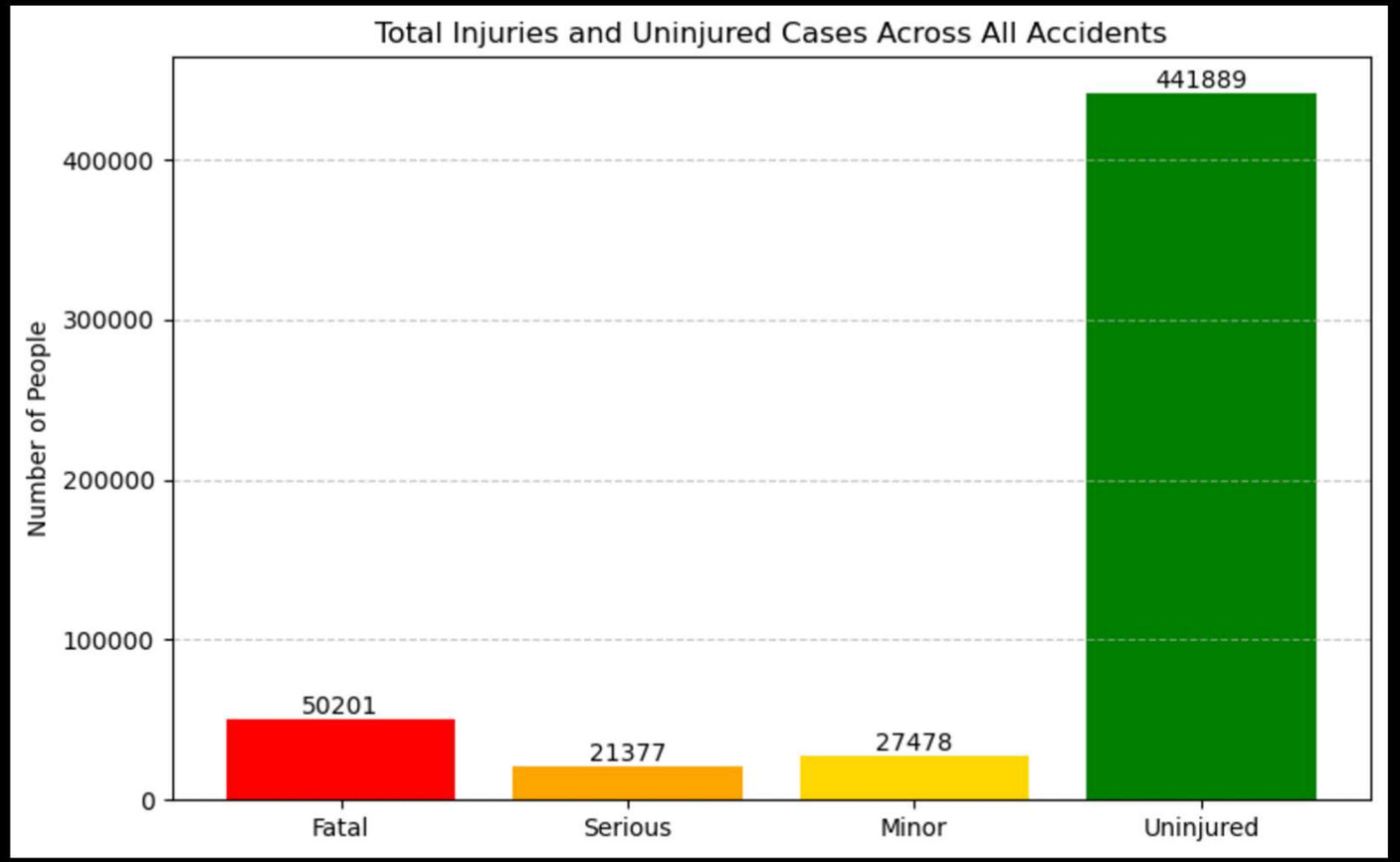
Our goal is not only to understand the nature of accidents, but to determine :

Which aircraft models and operational environments offer the lowest risk.

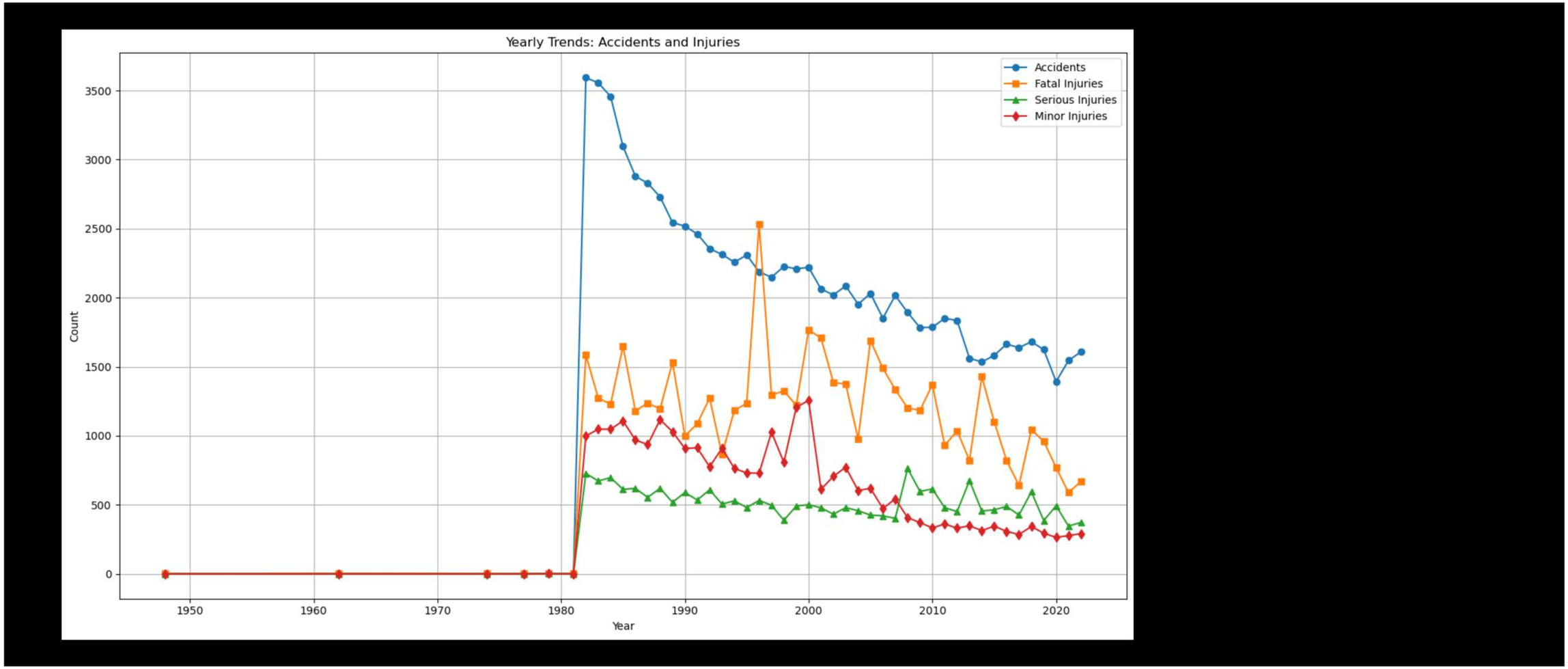
OBJECTIVES:

- The best aircraft models to consider.
- The most favorable operating conditions.
- The safest locations for operations.

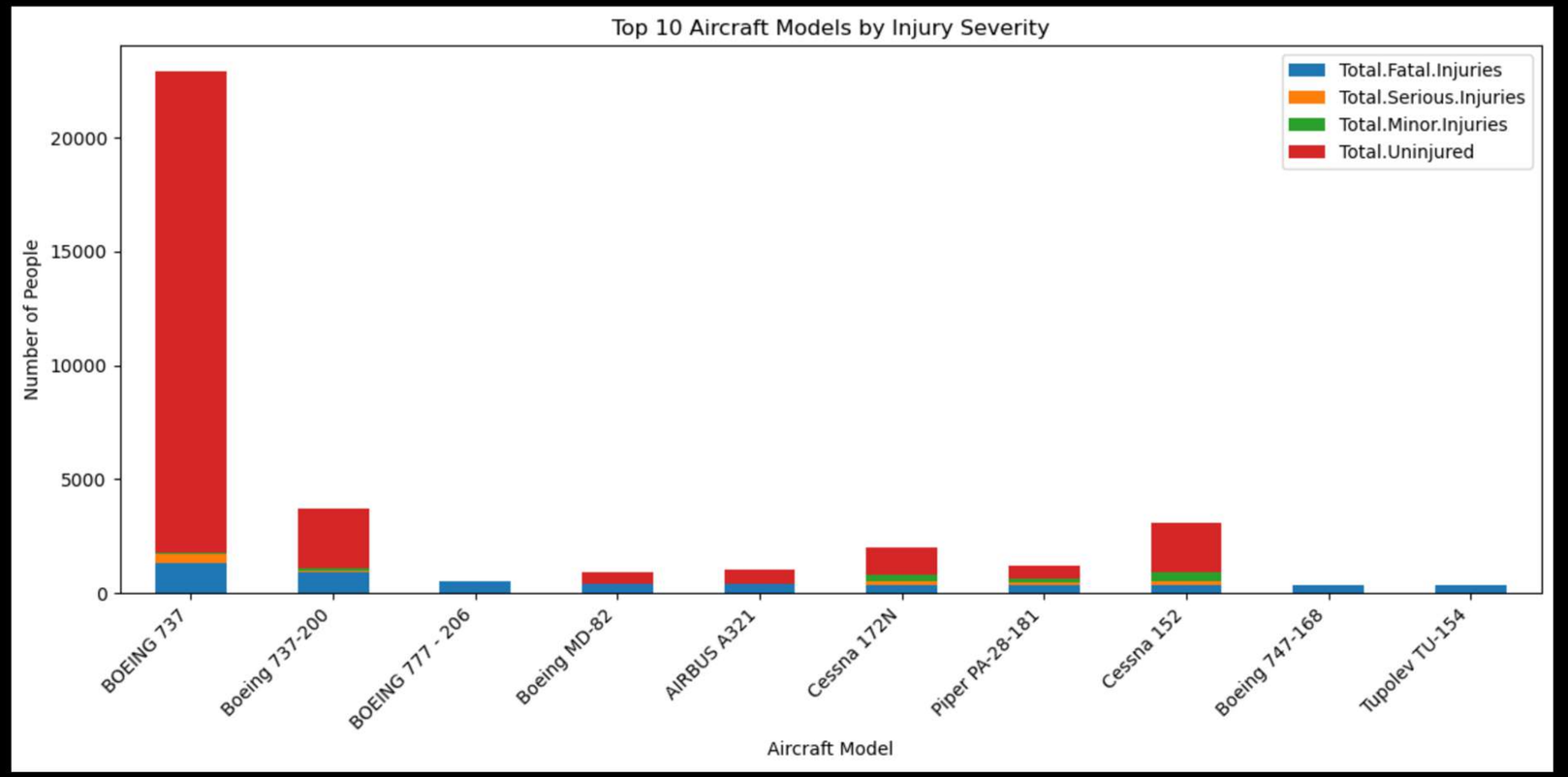
VISUALIZATION 1 : Total injured and uninjured cases



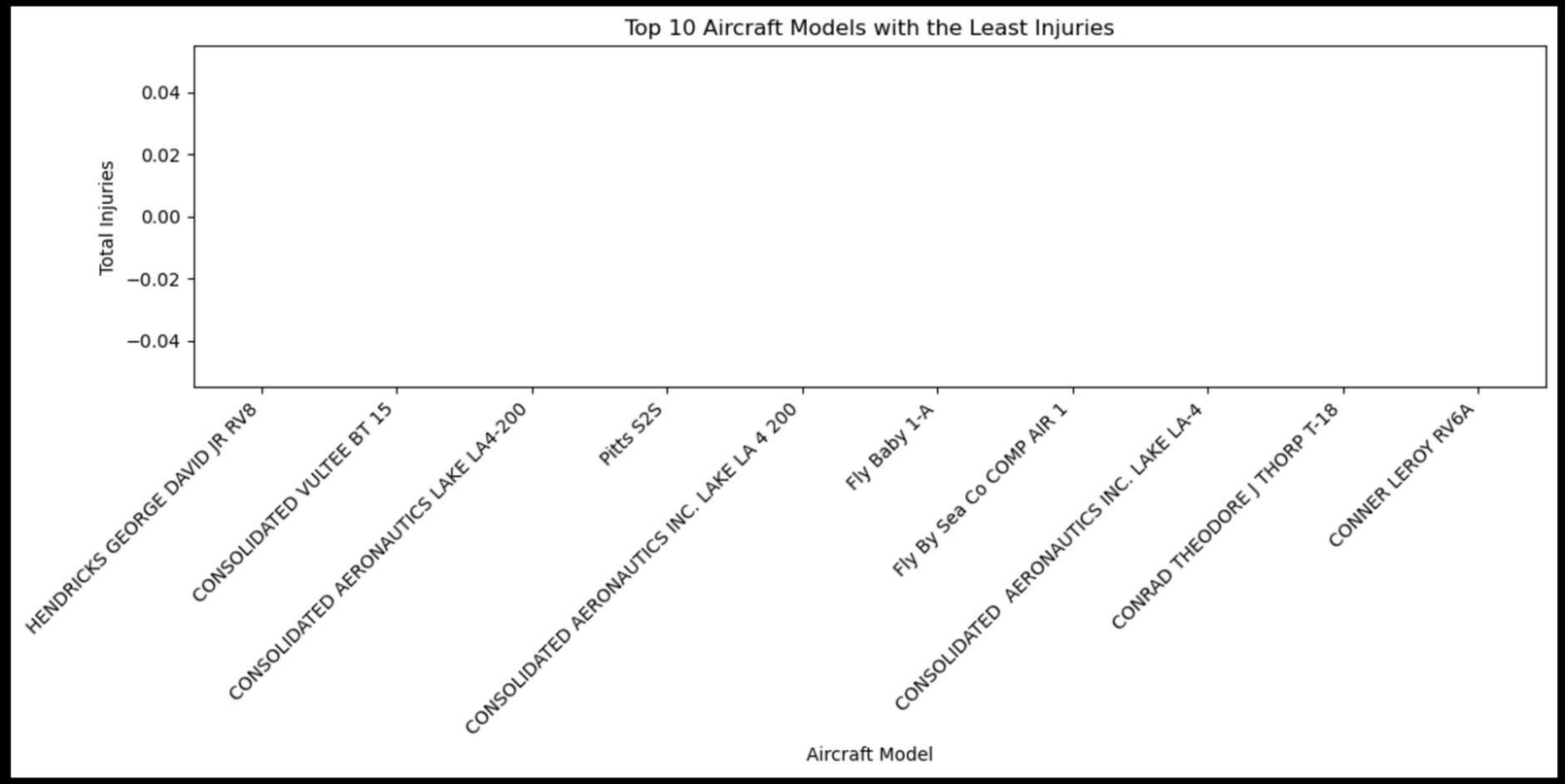
VISUALIZATION 2: Yearly trends accidents and injuries



VISUALIZATION 3: Top 10 Aircraft Models by Injury Severity



VISUALIZATION 4: Top 10 Aircraft Models with least injuries



An empty chart showing almost no case reports of the aircrafts


RECOMMENDATIONS

TOP 5 SAFEST AIRCRAFTS

1. HENDRICKS GEORGE DAVID JR RV8
- Incident Count: 1
- Total Injuries: 0.0
- Average Injuries: 0.0

2. **CONSOLIDATED VULTEE BT 15**
- Incident Count: 1
- Total Injuries: 0.0
- Average Injuries: 0.0

3. CONSOLIDATED AERONAUTICS LAKE LA4-200
- Incident Count: 1
- Total Injuries: 0.0
- Average Injuries: 0.0

4. **Pitts S2S**
- Incident Count: 1
- Total Injuries: 0.0
- Average Injuries: 0.0

5. **CONSOLIDATED AERONAUTICS INC. LAKE LA 4 200**
- Incident Count: 1
- Total Injuries: 0.0
- Average Injuries: 0.0

Top 5 Riskiest Aircraft

BOEING 737
- Incident Count: 435
- Total Injuries: 1804
- Average Injuries: 4.15

Boeing 737-200
- Incident Count: 53
- Total Injuries: 1064
- Average Injuries: 20.08

Cessna 152
- Incident Count: 2168
- Total Injuries: 922
- Average Injuries: 0.43

Piper PA-28-140
- Incident Count: 812
- Total Injuries: 877
- Average Injuries: 1.08

Cessna 172N
- Incident Count: 996
- Total Injuries: 835
- Average Injuries: 0.84

Recommendations

Aircraft Selection:

Invest in models with historically low incident and injury rates.

Operational Conditions:

Prioritize operations under Visual Flight Rules (VFR) and avoid areas prone to adverse weather.

Location Strategy:

Establish operations in regions with favorable weather patterns and lower historical accident rates.

NEXT STEPS

- **Further Analysis:**
  - Incorporate more recent data for up-to-date insights
  - Analyze maintenance records for additional risk factors
- **Implementation:**
  - Develop a risk assessment tool for aircraft investment decisions
  - Collaborate with meteorological experts for location analysis


A picture is worth a thousand words

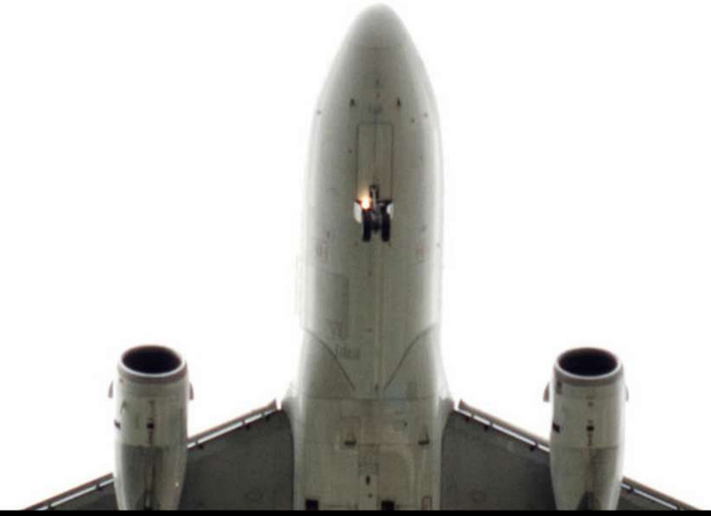
“

Where turbulence shakes the skies, insight from data steadies the course

LEEJAY MWAKIRETI.

THANK YOU

Questions and discussions are welcome!



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