



Insights from Aircraft Incident Data

A Data-Driven Investment Analysis



Minimal investment risk

search aircraft





Overview of dataset

Source: National Transportation Safety Board

About: National and international civil aviation and selected incidents from 1962-2023

Design Variables: Total Fatal, Serious, Minor injuries
Total Uninjured
Make
Model
Engine Type
Amateur Built
Aircraft Damage
Event Date

Missing Values: Rows missing complete data for make and model were dropped

Problem Statement

- ✈ Expanding company; needs to diversify portfolio
- ✈ Interested in operating airplanes
- ✈ Determine which low risk aircraft to purchase

Risk Assessment

Key Risk Indicator -----✈ Safety performance

Data Methodology



Passenger percent survival for each make and model set, determine the **10 safest airplanes**.

Next, design specifications that optimize safety explored:

► **Amateur Build Data:** Are amateur builds more dangerous?

► **Engine Type Data:** Are some engine types more likely to have lower passenger survival percentages?

► **Aircraft Damage:** Do certain make/model sets tend to be destroyed when they are in accidents versus other aircrafts?

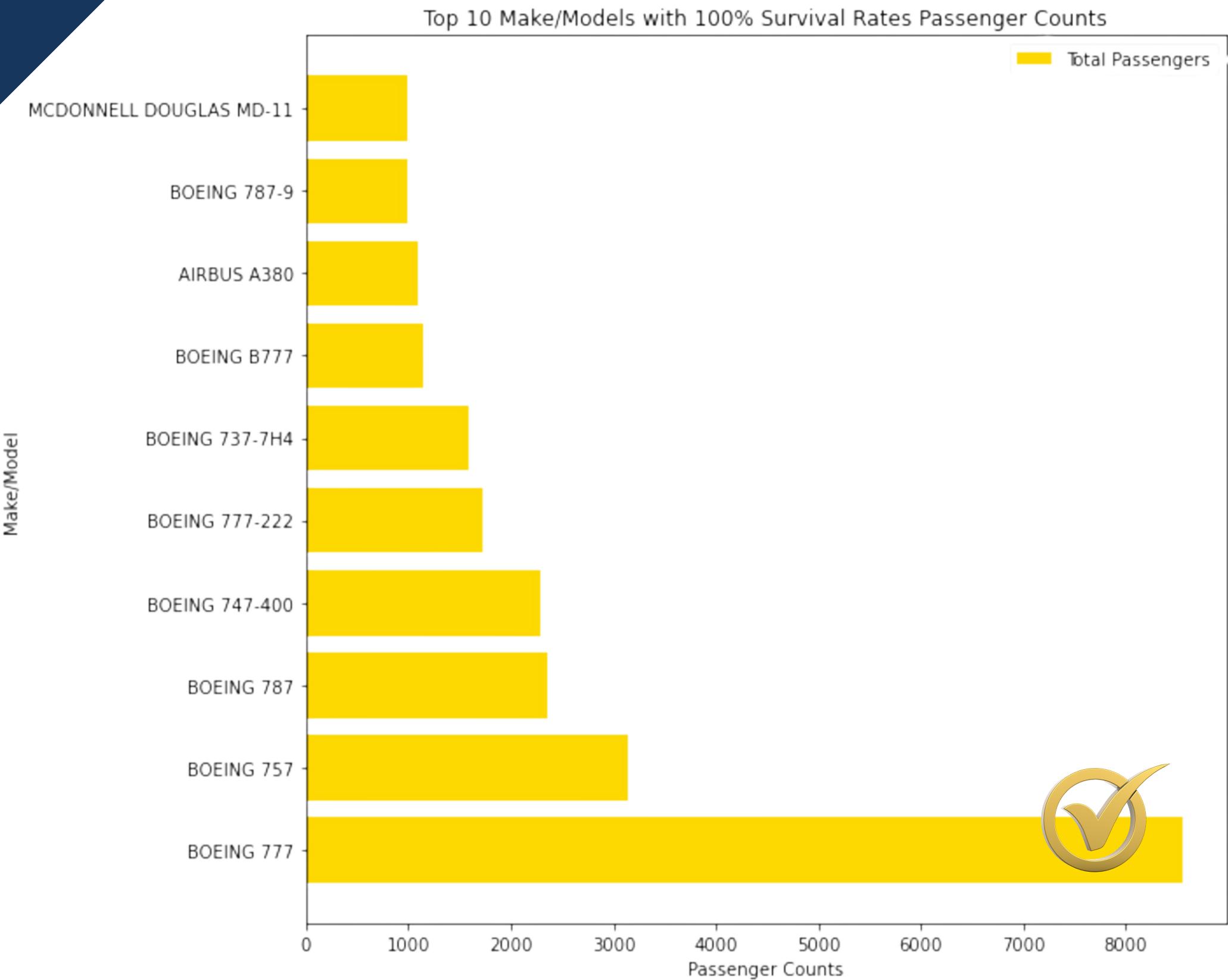


ANALYZING
AVIATION
SAFETY

$$\left(\frac{\text{total survivors}}{\text{total passengers}} \right) \times 100 =$$

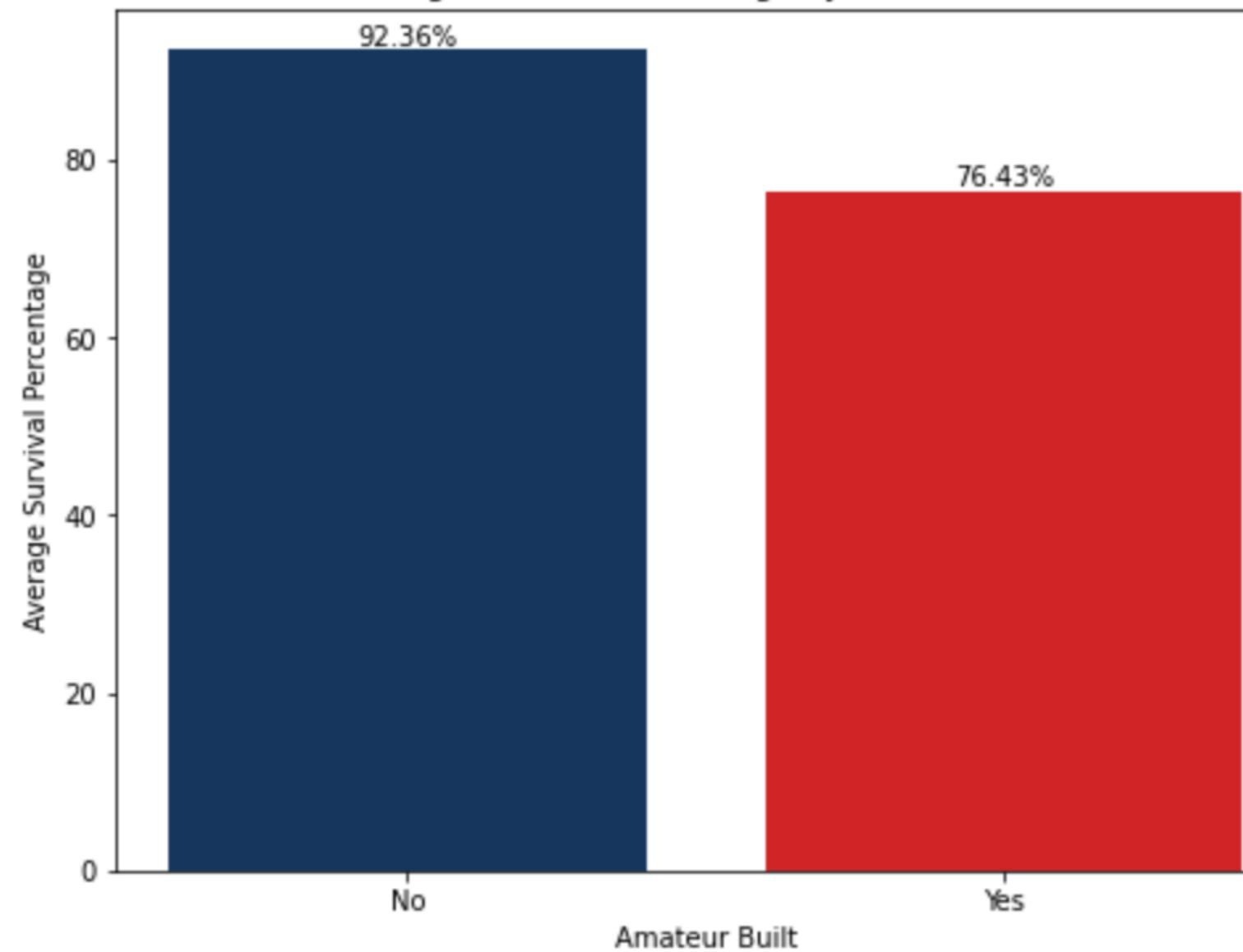


Safest Airplane

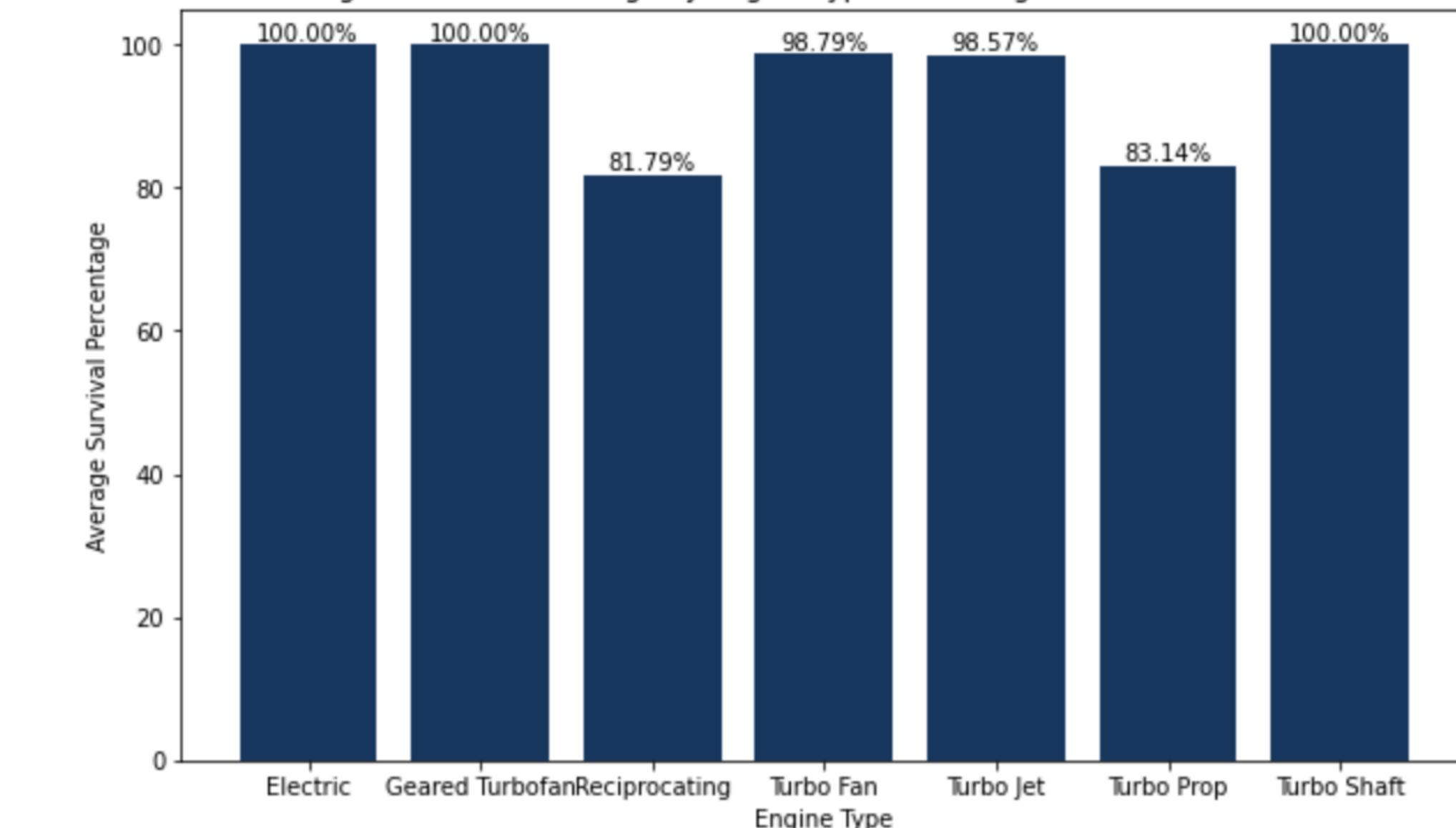


Results

Average Survival Percentage by Amateur Built



Average Survival Percentage by Engine Type (excluding UNK, Unknown, and NaN)



Amateur Build



Purchase professionally
manufactured airplanes

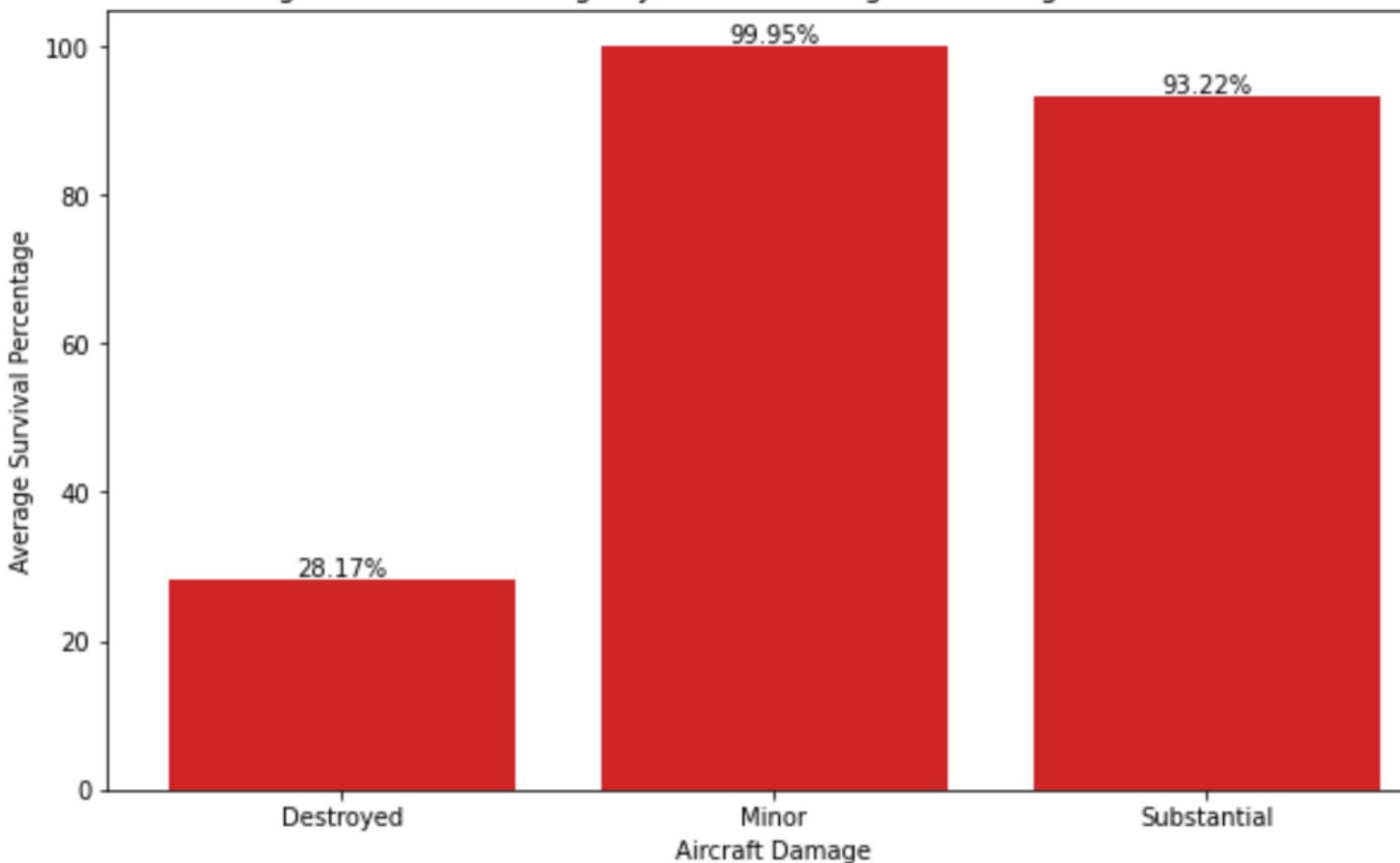
Engine Data



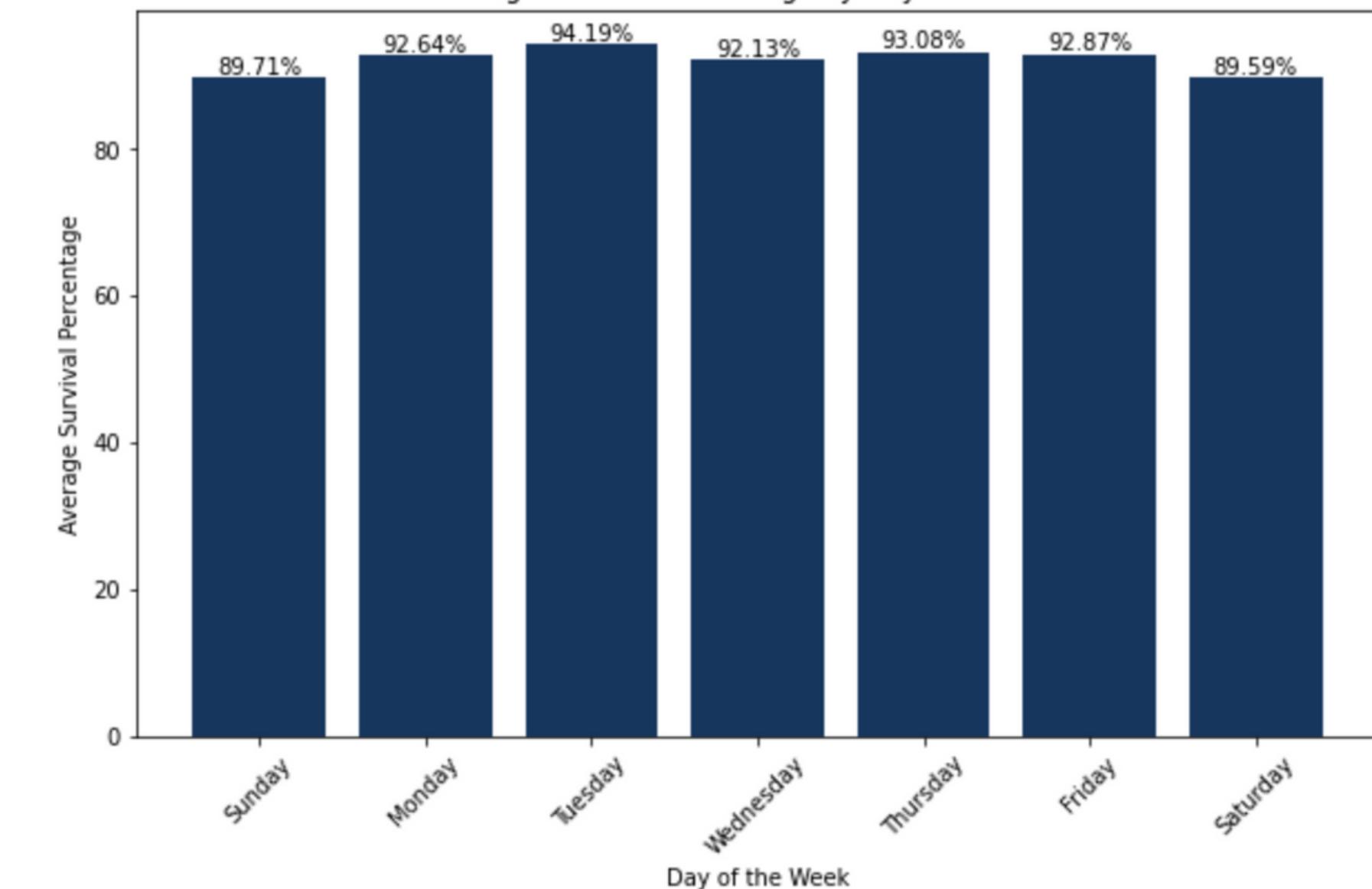
Consider further investigation of
the turbo fan engine

Results

Average Survival Percentage by Aircraft Damage (excluding Unknown, and NaN)



Average Survival Percentage by Day of the Week



Aircraft Damage

Airplanes that sustain minor damage in accidents are low-risk



Safest Day of the Week

Consider offering lower fares and promotions on weekdays when it is safer to fly





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Aircraft Incident Data

Actionable Insights

The safest overall airplane is Boeing 777

Safest Design Specifications:

Turbo Fan Engine



Professional Build



Minor Airplane Damage Reported



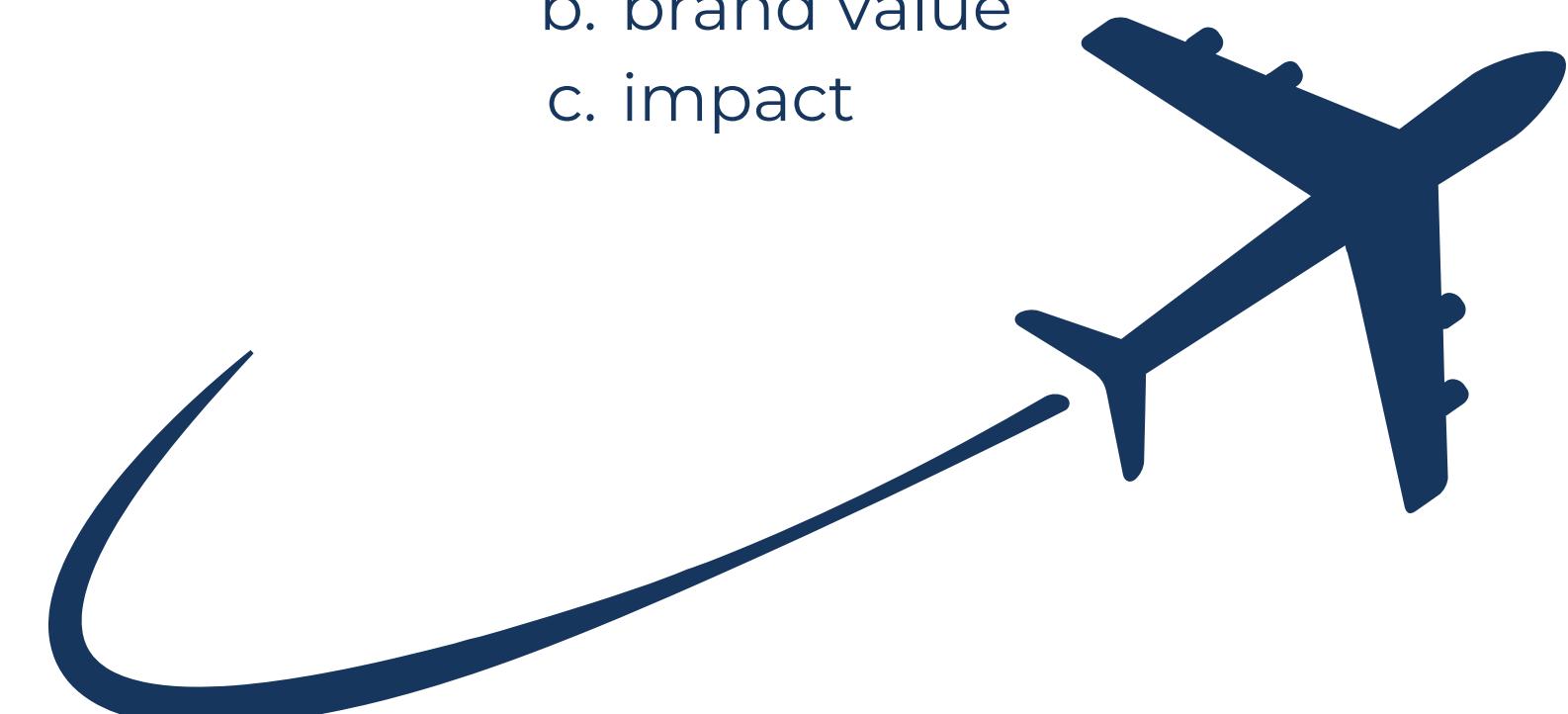


Limitations

1. Data does not represent all aviation accidents.
2. Missing data in certain columns affects the accuracy of the analysis.
3. Domain expertise are required to fully interpret the results for safety improvements.

Next Steps

1. Investigate **operational efficiency** variables:
 - a. regulatory compliance
 - b. insurance costs
 - c. flight paths
2. Investigate **competitive advantage** variables:
 - a. reputation
 - b. brand value
 - c. impact





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Thank You For All Your Time & Attention



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GitHub