Airplane Safety Data Analysis

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Summary

Measuring airplane safety.

- Factors of risk/safety:
    - Total fatal injuries
    - Total serious injuries
    - Total uninjured
    - Aircraft damage

- What we can control:
    - Make
    - Model
   - Number of Engines

Outline

- Business Problem
- Methodology
- Data and Limitations
- Results
- Conclusion
- Next Steps

Business Problem

- Selling small airplanes for instructional purposes in the US.
- Goal: least amount of risk → greatest amount of safety
- Frequency of accidents in this market
- Reliability → Sales → Growth
- Accident Data

Methodology

- CRISP-DM: Cross-Industry Standard Process for Data Mining
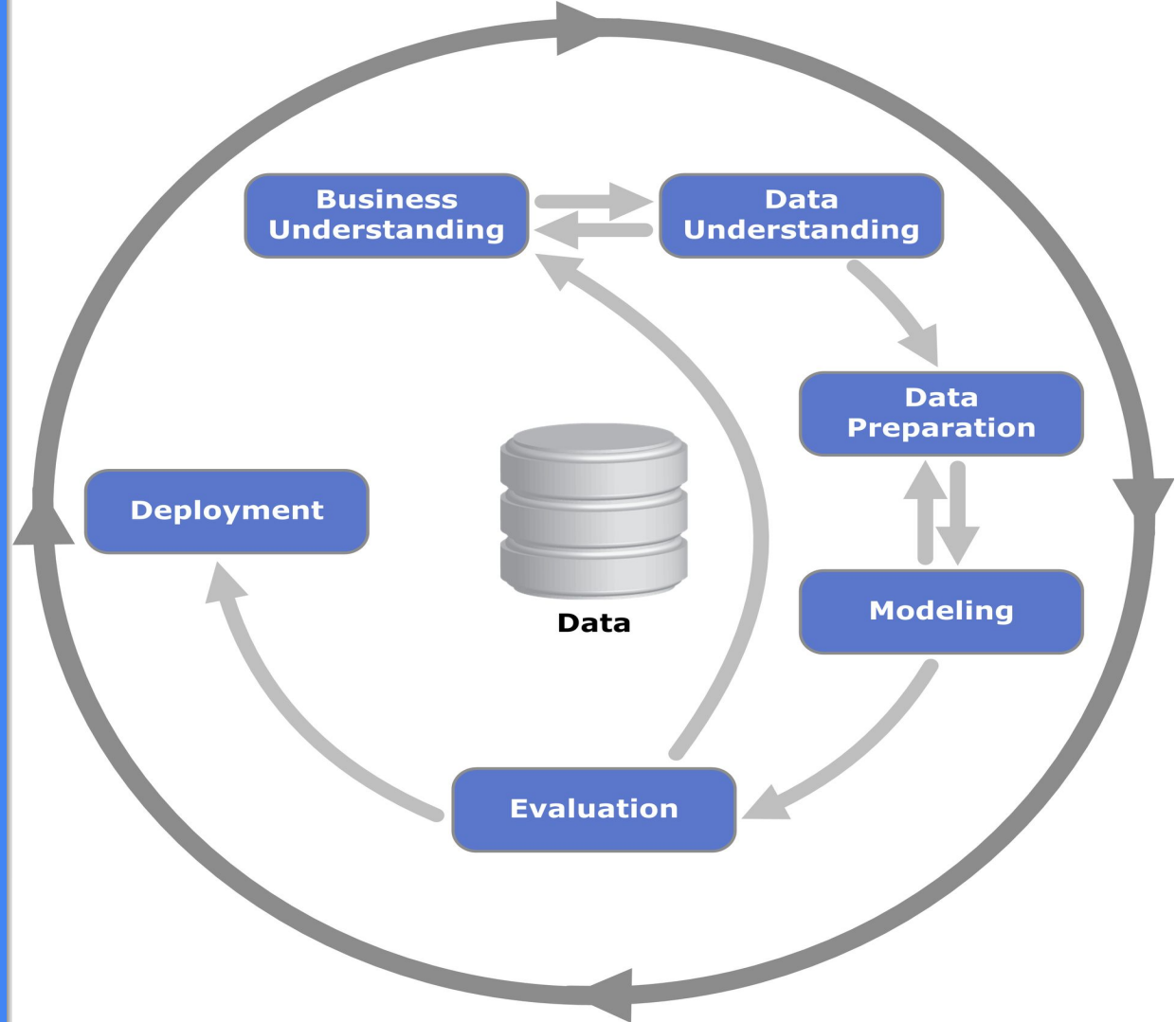
Data Understanding and Limitations

Dataset:
- Dataset: National Transportation Safety Board
- The dataset can be found here on kaggle:
  https://www.kaggle.com/datasets/khsamaha/aviation-accident-database-synopses
- 90,000 accidents → 40,000 small instructional airplanes accidents
- Safety in the event of accident

Limitations:
- Availability, cost, number of flights, mileage, or maintenance
- Most highly represented
- Patterns/trends
- Recommend future actions

Result 1

- Serious Accident
- Airplane Make vs Uninjured
- Makes recommended:
  - Cessna
  - Piper
  - Beech
  - Mooney

Passengers Not Injured per Airplane Make
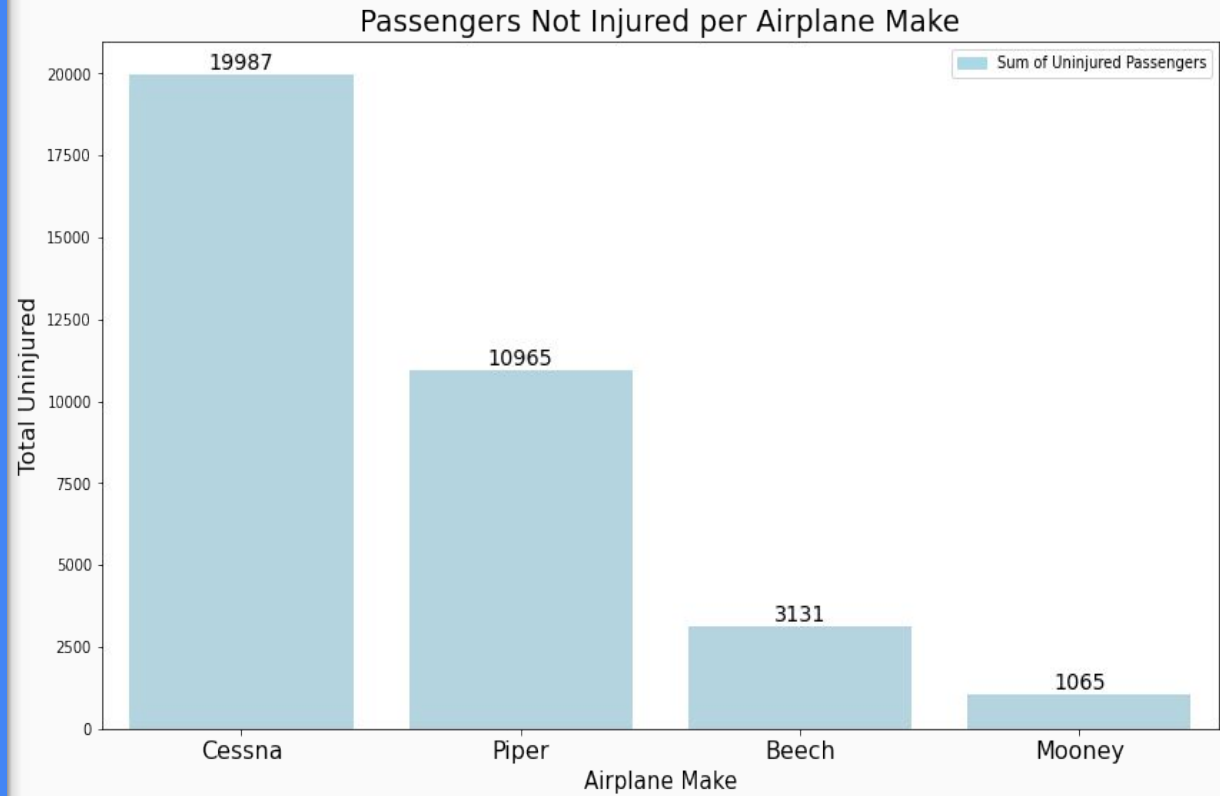
Result 2

- Serious Accident
- Model vs Total Fatal/Serious Injury
- Models recommended:
  - Piper- PA38, PA22, PA18, PA24, PA32, PA28
  - Cessna- C180, C152, C210, C150, C182, C172
  - Beech- Be58, Be23, Be95, Be36, Be35
  - Mooney- M20

Passengers Severely and Fatally Injured per Airplane Model
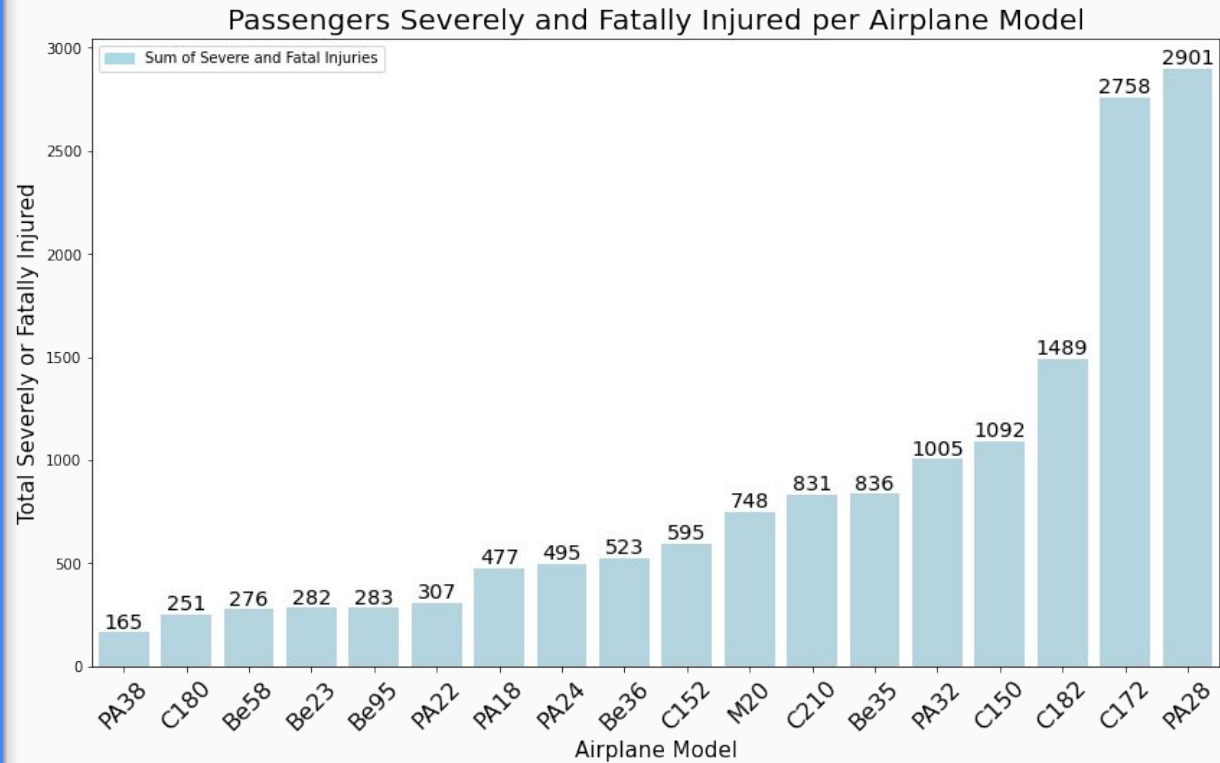
Result 3

- Glide Ratio/Landing
- Number of Engines vs Fatalities
- 2 recommended

Fatalities per Number of Engines
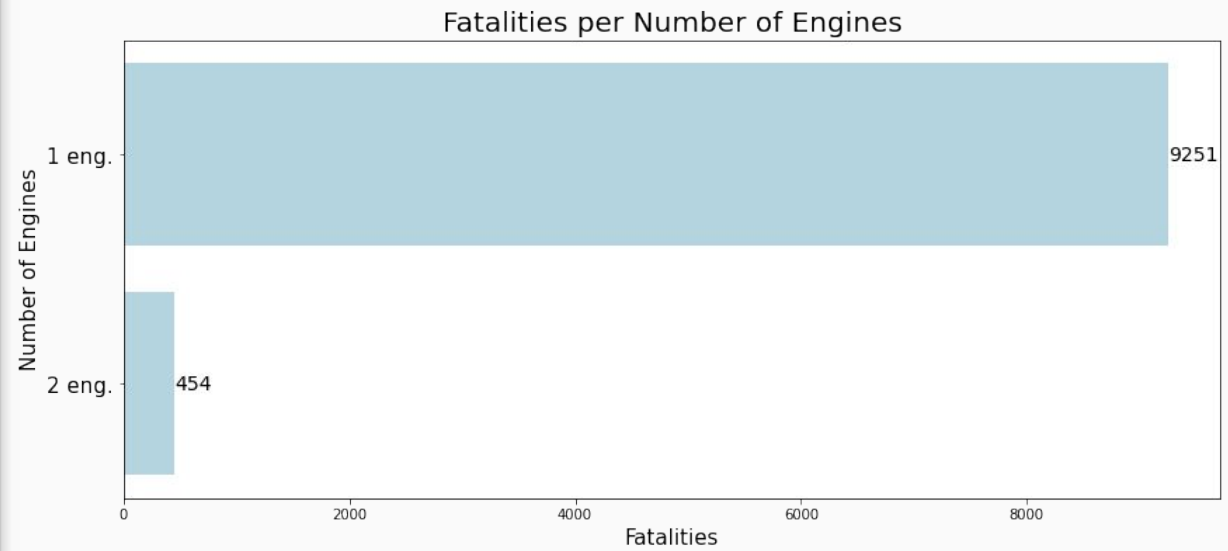
Conclusion

- Safest airplane
- Increased reliability, sales, and growth
- Limitations
- Make vs. uninjured
  - Cessna, Piper, Beech, and Mooney.
  -
- Model vs. total fatal/serious injuries
  - Piper- PA38, PA22, PA18, PA24, PA32, PA28
  - Cessna- C180, C152, C210, C150, C182, C172
  - Beech- Be58, Be23, Be95, Be36, Be35
  - Mooney- M20
  -
- Number of engines vs. fatalities
  - glide ratio

Next Steps

- Data Enrichment:
    a. Availability
    b. Cost
    c. Total flights
    d. Total mileage
    e. Maintenance
- Compare Risk with Cost and Availability

Questions

Thank you

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