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Aircraft Risk Analysis

Business Problem

- New venture in aviation
- Assess risk of aircrafts
- Informed decisions for success

Summary

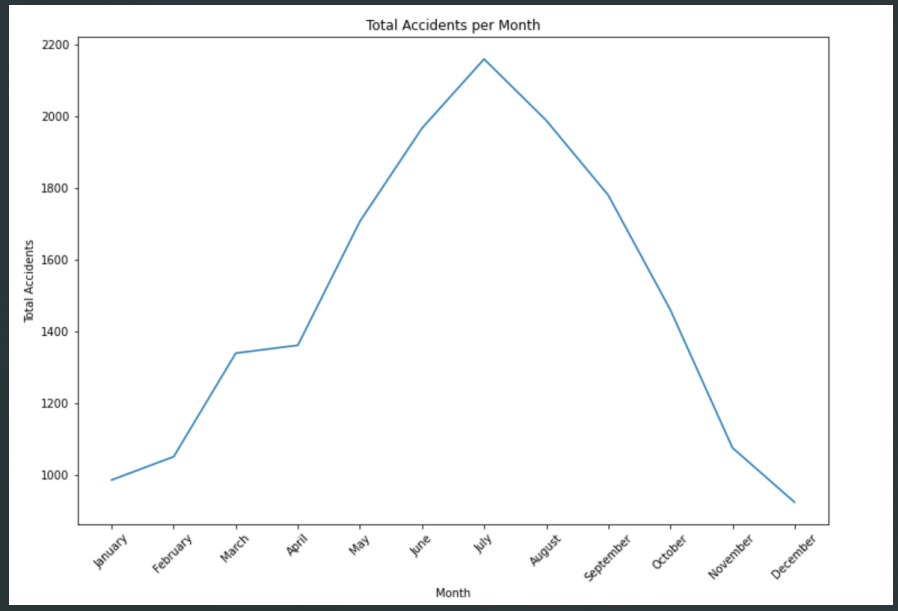
- After reviewing the aviation accident dataset, three recommendations stand out to mitigate risk entering the field of aviation.
  - Time-Based Safety Measures
  - Regional Safety Measures
  - Engine-Configuration Awareness

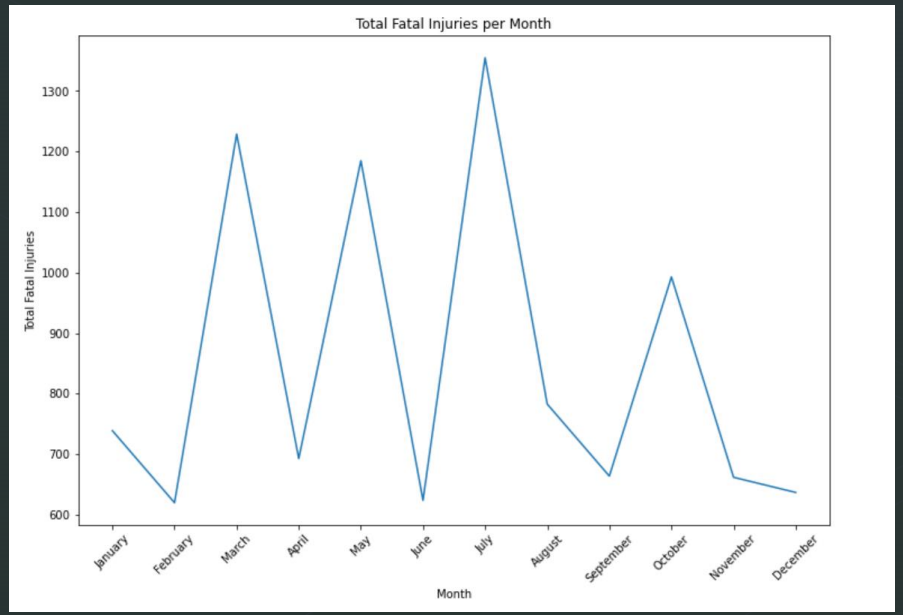
Data

- Airplane accidents
- Data filtered from 2010 to 2023
- Occurred in USA
- Focuses on fatal injuries by
  - Time by Month
  - Location by State
  - Engine Configuration

Data

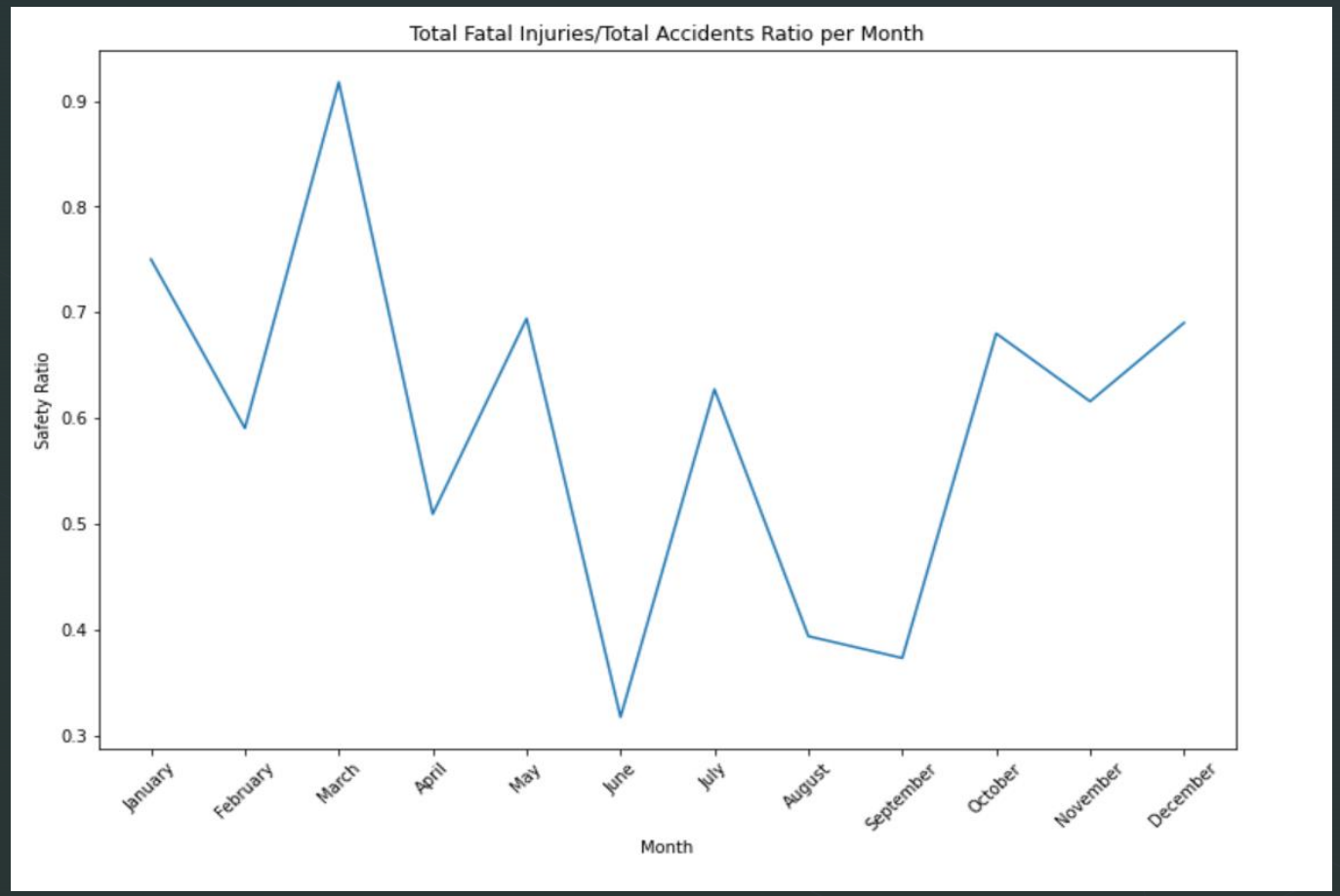
- Total Accidents
- Total Fatal Injuries
- Safety Ratio
  - Total Fatal Injuries / Total Accidents
  - Lower ratio indicates less total fatal injuries per accidents



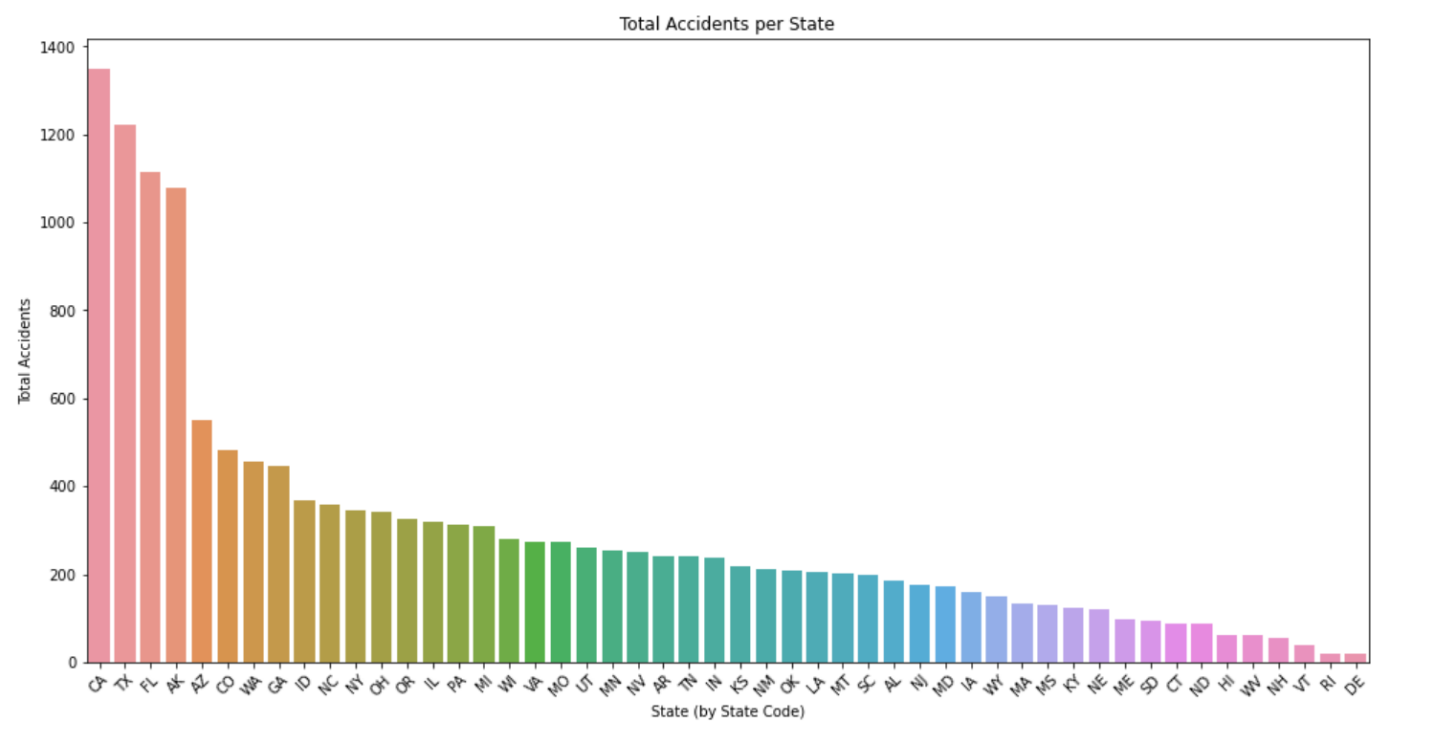


Results – Safety Ratio per Month

- Low Safety Ratio in Summer
  - High Accidents
  - Low Fatalities
- High Safety Ratio in Winter/Early Spring
  - Low Accidents
  - High Fatalities

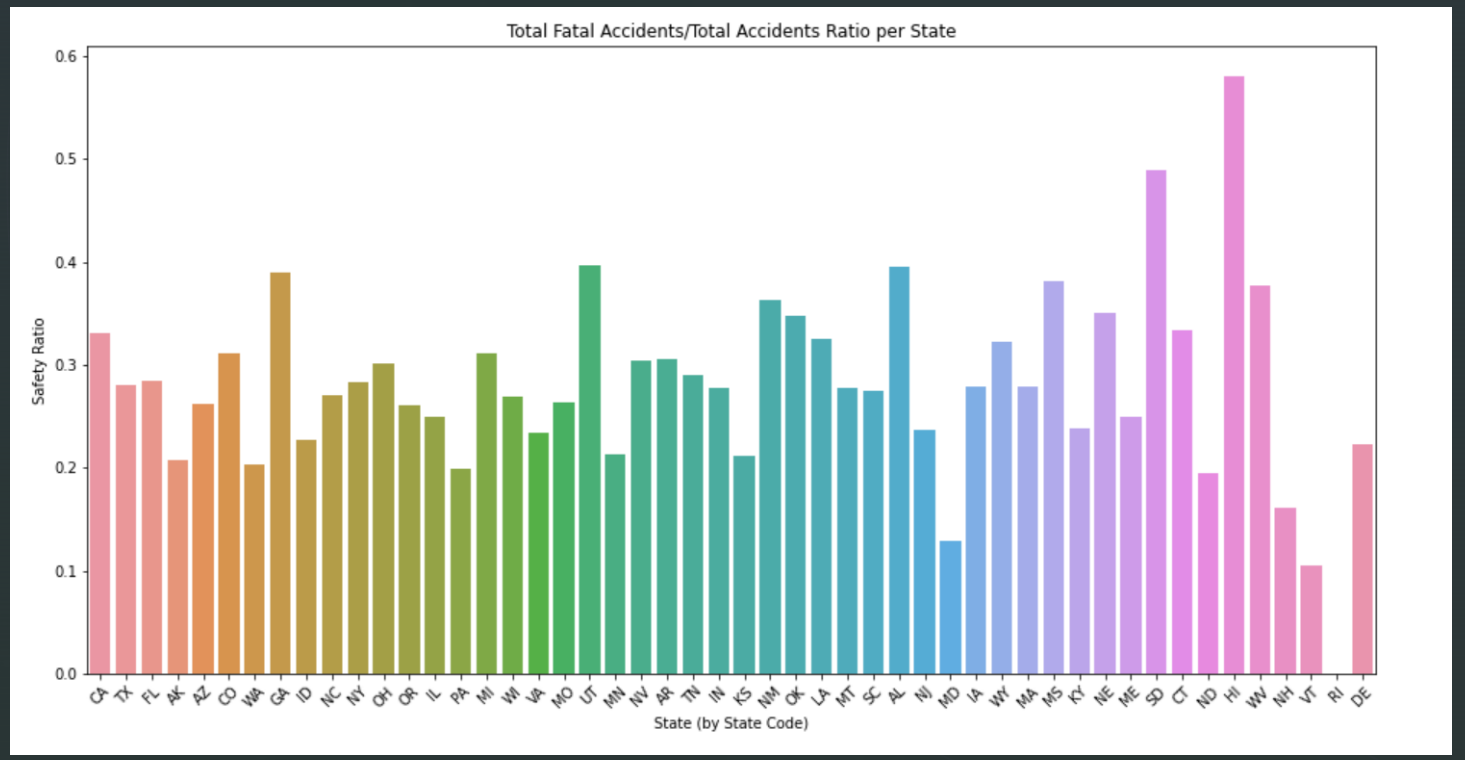


Results – Total Accidents by State



- High traffic areas more accidents
  - Trend of higher to smaller populated areas

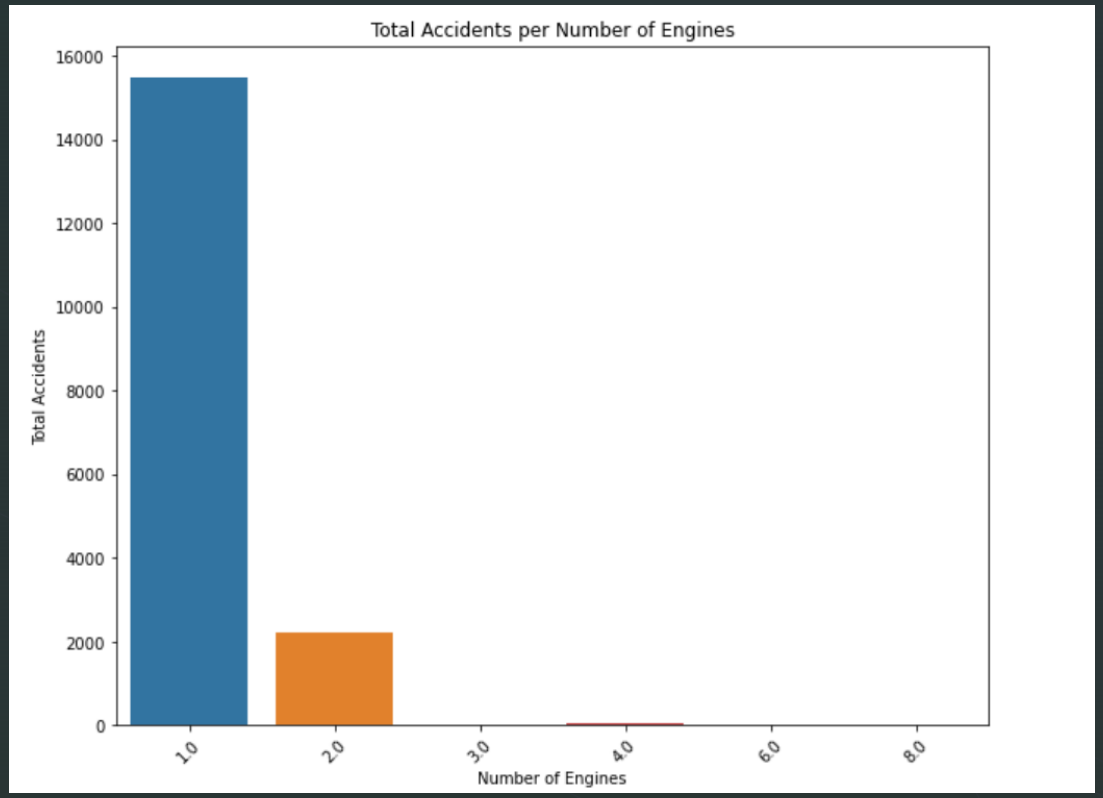
Results – Safety Ratio by State



- Majority lower than .3 Safety Ratio
- High Traffic areas – Low Fatalities/High Accidents
- Focus on High Fatalities-Low accidents
  - Hawaii, South Dakota, Mississippi

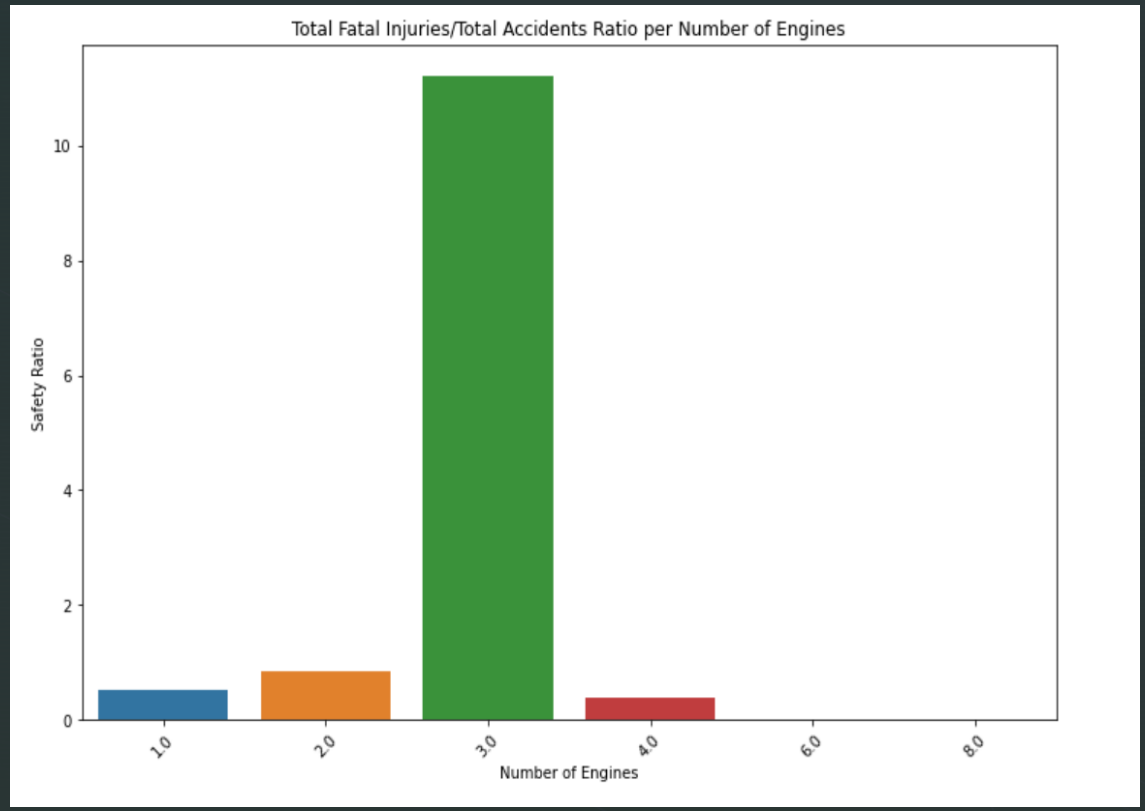
Results – Total Accidents per Engine Configuration

- Planes with 1 engine configuration
    - High Accident Count
- trend is lower with more engines

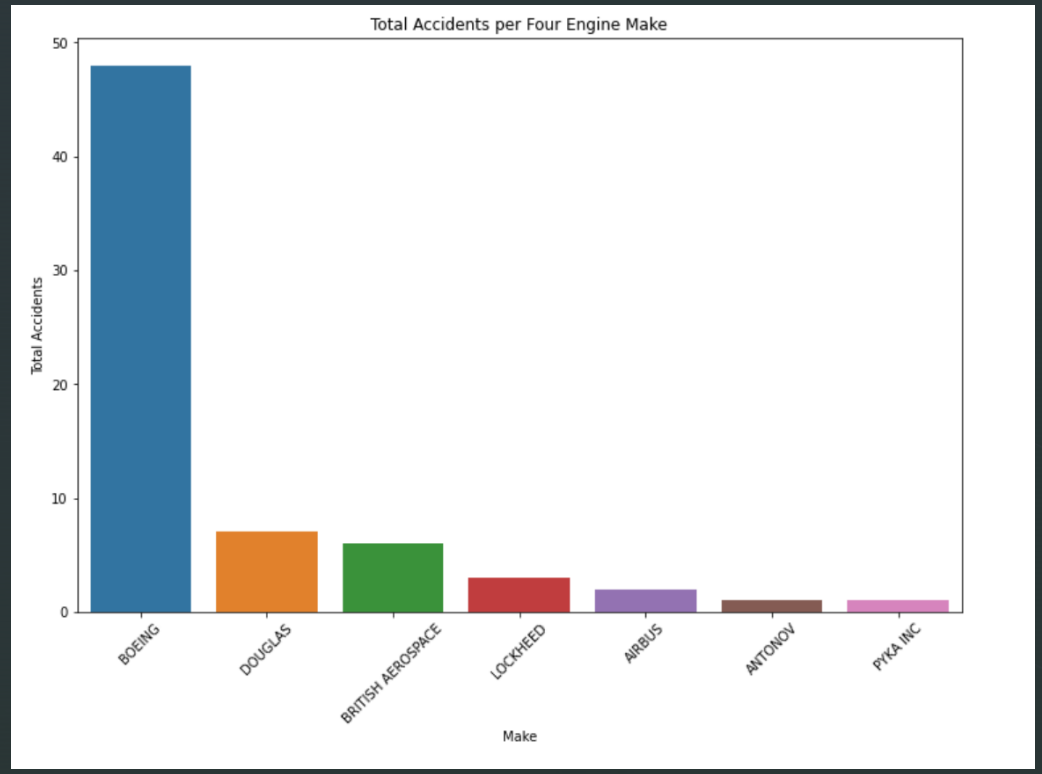


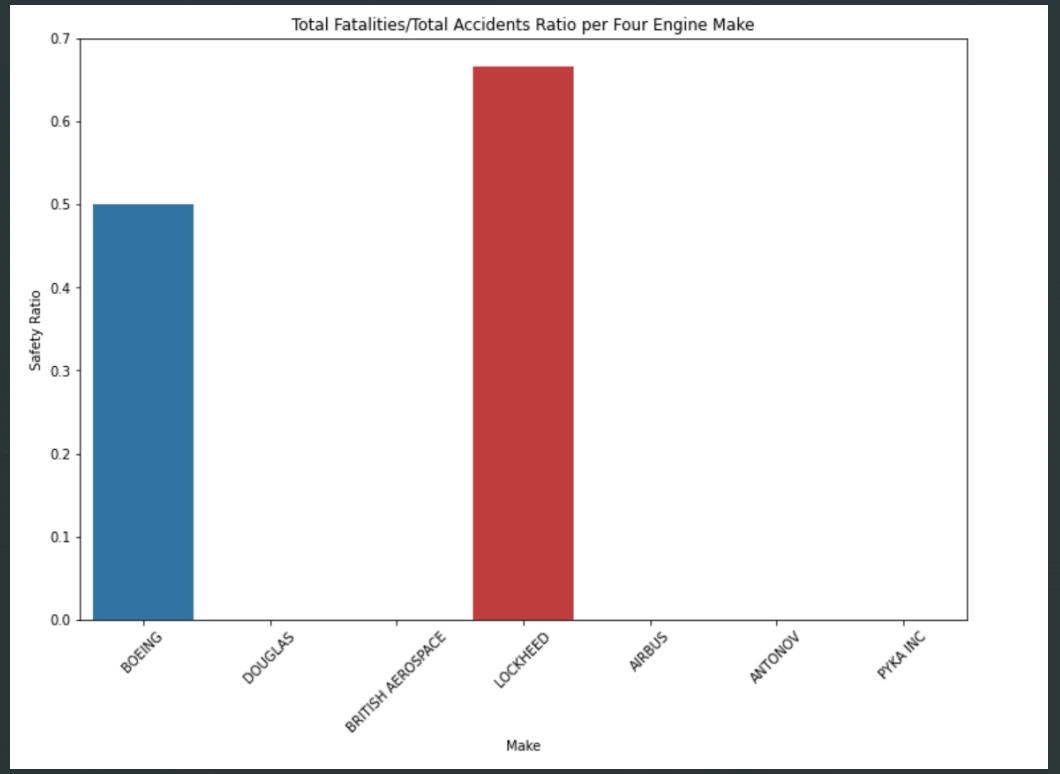
Results – Total Accidents per Engine Configuration

- High Safety Ratio
  - High number of fatal injuries/low number of accidents
- Four Engines
  - Low accident count
  - Low fatality count



Results – Engine Configuration Explored





- Four Engine Configuration
  - Less Accidents
  - Zero Safety Ratio indicates no fatalities

- In reviewing the data visualizations of safety ratios, it becomes evident that certain areas exhibit a higher safety ratio than others, raising critical concerns about potential risks and prompting a focused measures in the areas of time, location, and engine configuration.

Recommendations

- Time-based Safety Measures:
  - Targeted training programs, extra safety procedures, or enhanced communication protocols
  - Apply Successful measures from Winter and Spring months to improve safety in Summer season
- Regional Safety Initiatives:
  - Collaborate with aviation authorities and local operators in states with lower ratios
  - Tailor safety protocols to address unique challenges in each region
- Engine Configuration Awareness:
  - Consider purchasing airplane models with *Four* or more engines
  - Multiple Engines have decreased the likelihood of accidents therefore less fatalities

Next Steps

- Assess other factors such weather or purpose of flights
- Assess modern safety practices such as maintenance