Our Foray into the Airplane Business

By Mohammad Abou-Ghazala

Roadmap

1. Business Problem
2. Data Summary and Preparation
3. Visualization
4. Summary and Recommendations

Business Problem

- Company needs to expand and acquire airplanes for commercial and private enterprise use

- Need insight as to which airplanes to invest in:
  a. **Which airplanes carry *the lowest risk?***
  b. **What are the *characteristics* of the airplanes with lowest risk?**

Data Overview

- Dataset from **Aviation Accident Database & Synopses**
  a. More than 88,000 aircraft incidents since the 1940s
  b. More than 30 categories

- **Critical categories:**
  - Number of Engines
  - Engine Type
  - Make and Model of Plane
  - Injury Severity and Total Injuries
  - Aircraft Damage

Data Preparation

- Narrowed dataset to years of **1982-2019**
  a. Change in flight standards
  b. Steep drop in flights due to COVID pandemic

- Focused on entries with data available for the **Critical Categories** discussed prior

- **Confounding Factors**:
  - Age of the aircraft
  - Aircraft maintenance policies of the airlines
  - Experience and talent of the pilot and crew

Data Preparation

- **Exploring relationship between**:
  - Airplane Type (Make/Model)
  - Engine Type
  - Number of Engines
  - Total Injuries
  - Damage Severity

- **Damage Severity**

  Calculating average of **Substantial/Destroyed** vs. **Minor**

Data Visualization

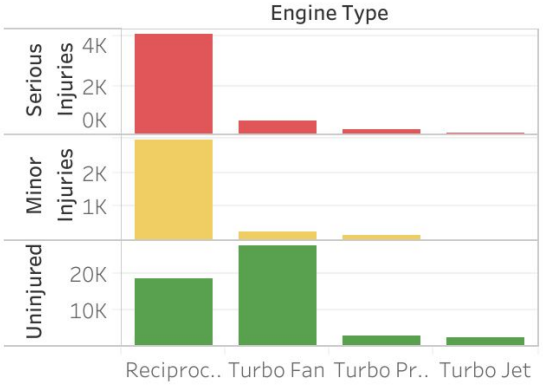
Takeaways:

1. Aircraft with **Turbo Fan engine type** have:
   a. **much lower rates** of serious and minor injuries
   b. **higher rates** of uninjured.

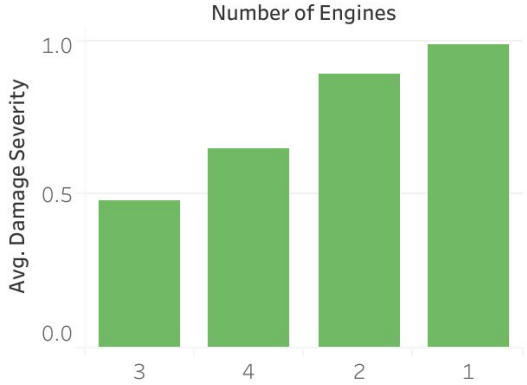
2. Aircrafts with 2-4 engines have lower rates of damage severity to the vehicles.

3. Cessna aircrafts with 4 engines have the lowest rates of severe damage.

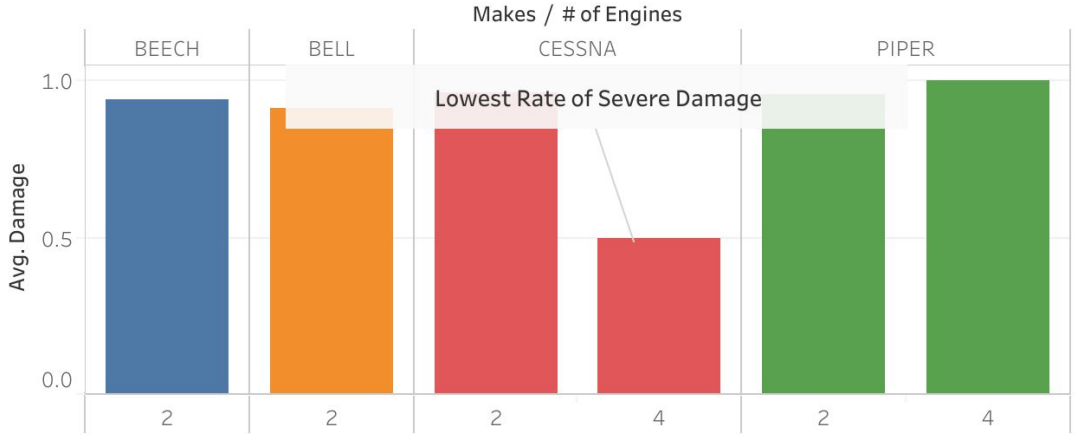
Total of Injuries and Uninjured, by Engine Type



Relation of Number of Engines to Damage Severity



Lowest Rate of Severe Damage = Cessna with 4 Engines



Summary & Recommendations

Acquiring **Cessna airplanes with 4 Turbofan engines** is the safest option

Avoiding **Reciprocating Engine** types

Ensuring airplane has **at least 2 engines**

Questions?