Flying into New Markets… *Safely*

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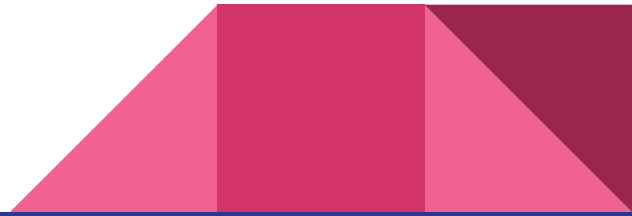


Business Understanding

Background

Looking to invest in airplanes in order to expand into other markets

Goals

Provide three recommendations on which aircraft are the *least risky*

Success Criteria

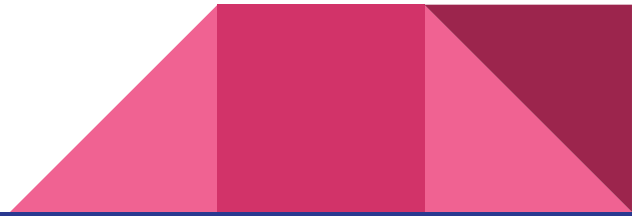
Define '*least risky*' to refer to types of aircrafts with:

- the least amount of accidents
- the least number of casualties
- the lowest fatality rate

Data Understanding

Dataset on aviation accidents and incidents from The National Transportation Safety Board (NTSB)

- Includes 31 features and 88,889 entries
- Each entry represents an aircraft involved in an accident (or incident)
- Some additional features:
  - Date
  - Location
  - Number of injuries
  - Make
  - Model
  - Number of engines



Data Preparation

1. Created functions to assist with assessment of data.
2. Dropped columns with high NaN values or that were unhelpful for analysis: *Longitude*, *Latitude*, *FAR.Description*, and others.
3. Cleaned data for professionally built airplanes, categorized *Injury.severity*, standardized *Make* feature, resulting in a ~65,000-entry dataframe with 18 columns.

Data Analysis

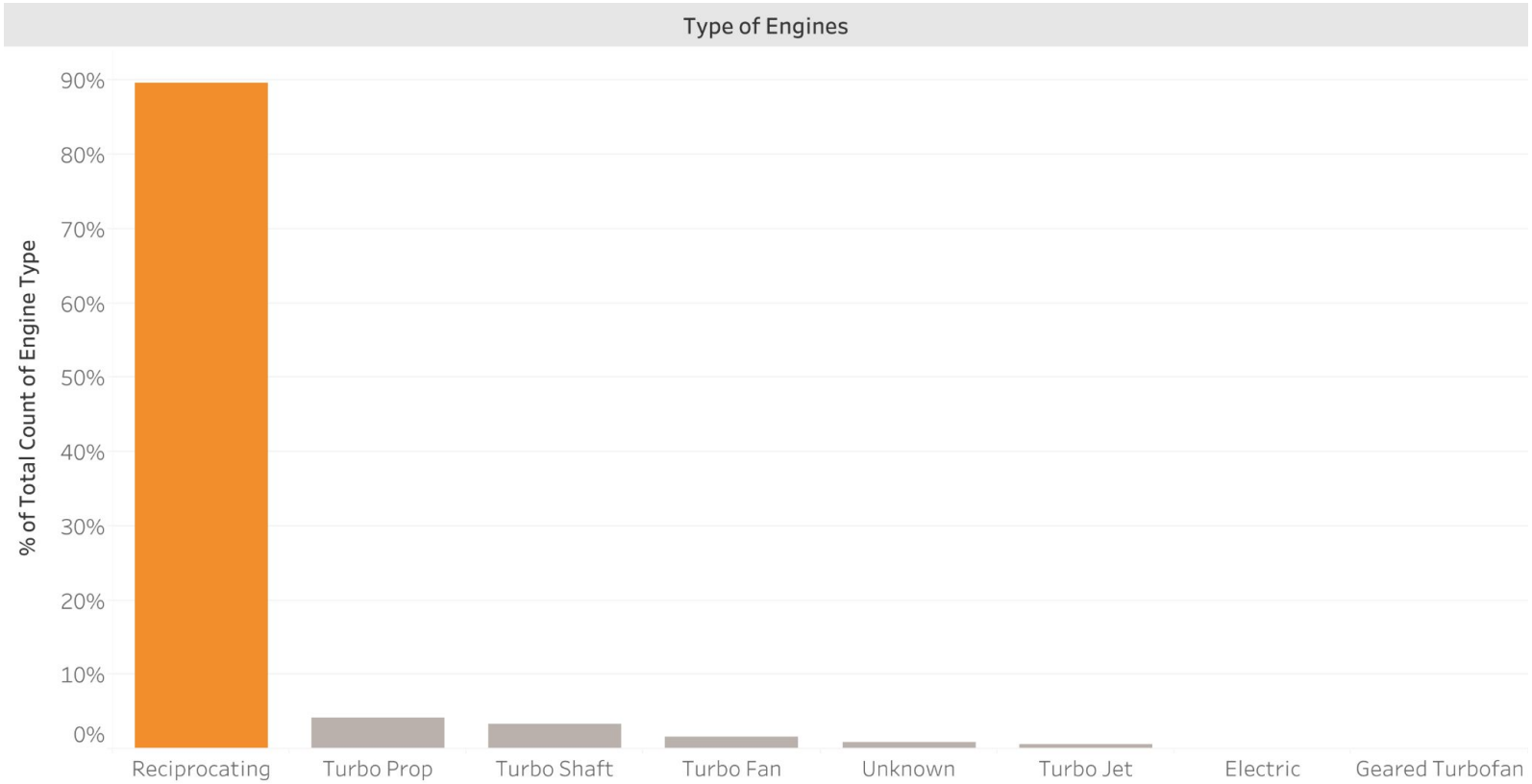
- Total of **64,862** recorded aviation accidents since 1948

- **18.2%** of accidents were classified as **‘fatal’**

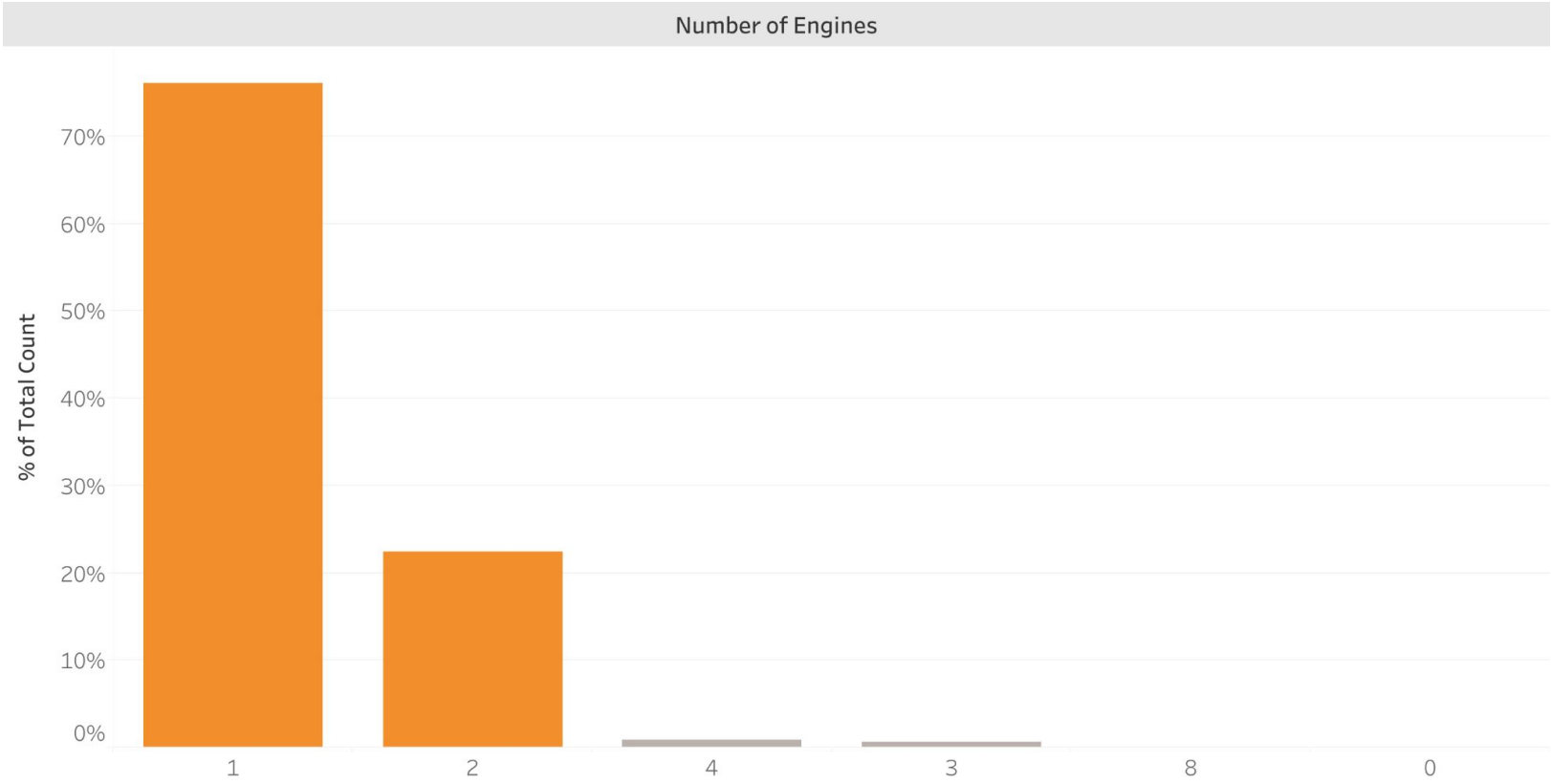
Data Analysis

- One type of engine was involved in **~90%** of recorded aviation accidents
- **~98%** of all accidents occurred in aircraft with **less than 3 engines**
- **Two flight phases** were responsible for **over 30%** of all accidents
- There are **7 aircraft companies** which would be considered the **safest** based on the metrics of Non-Fatal rate, Total Death Toll, and Deaths per flight

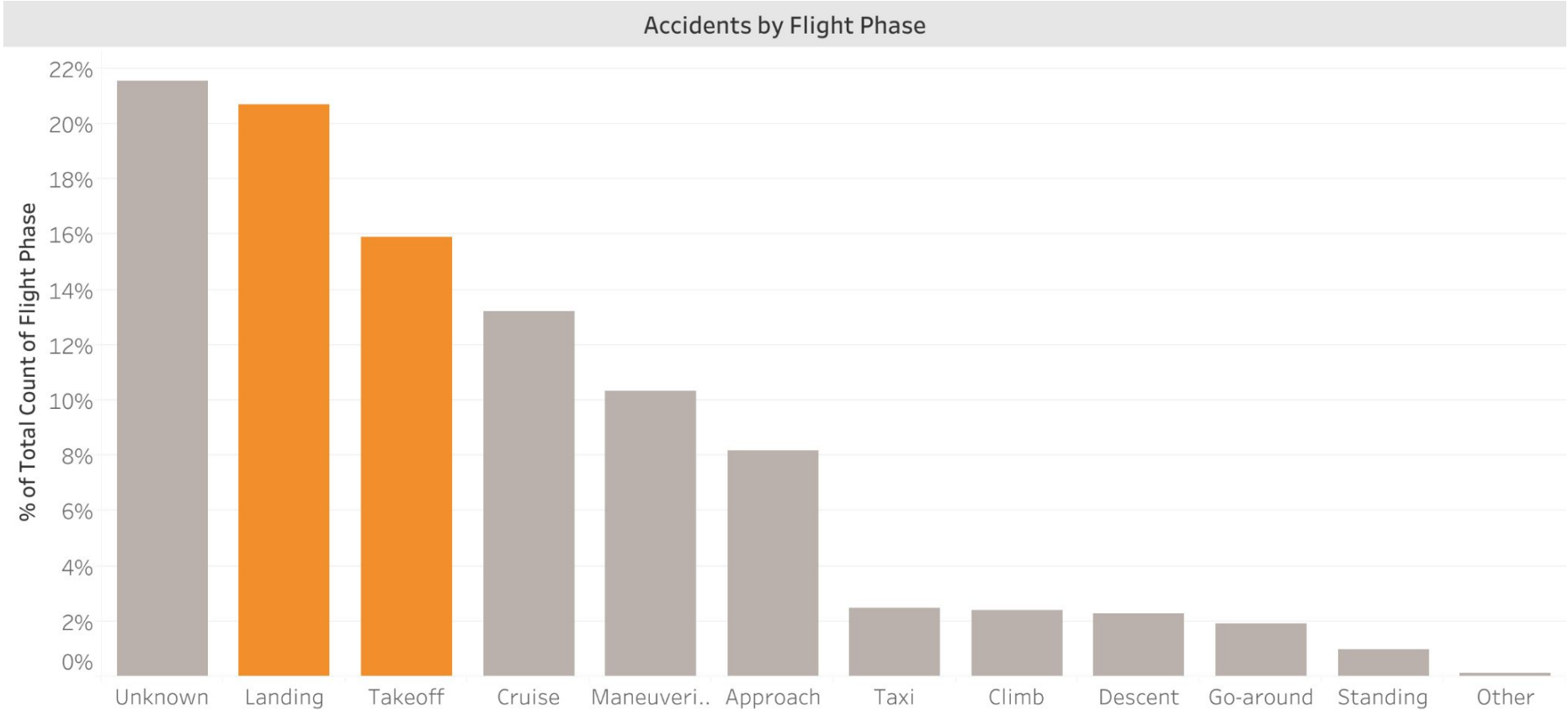
Reciprocating engines make up almost 90% of all engine types involved in aviation accidents.



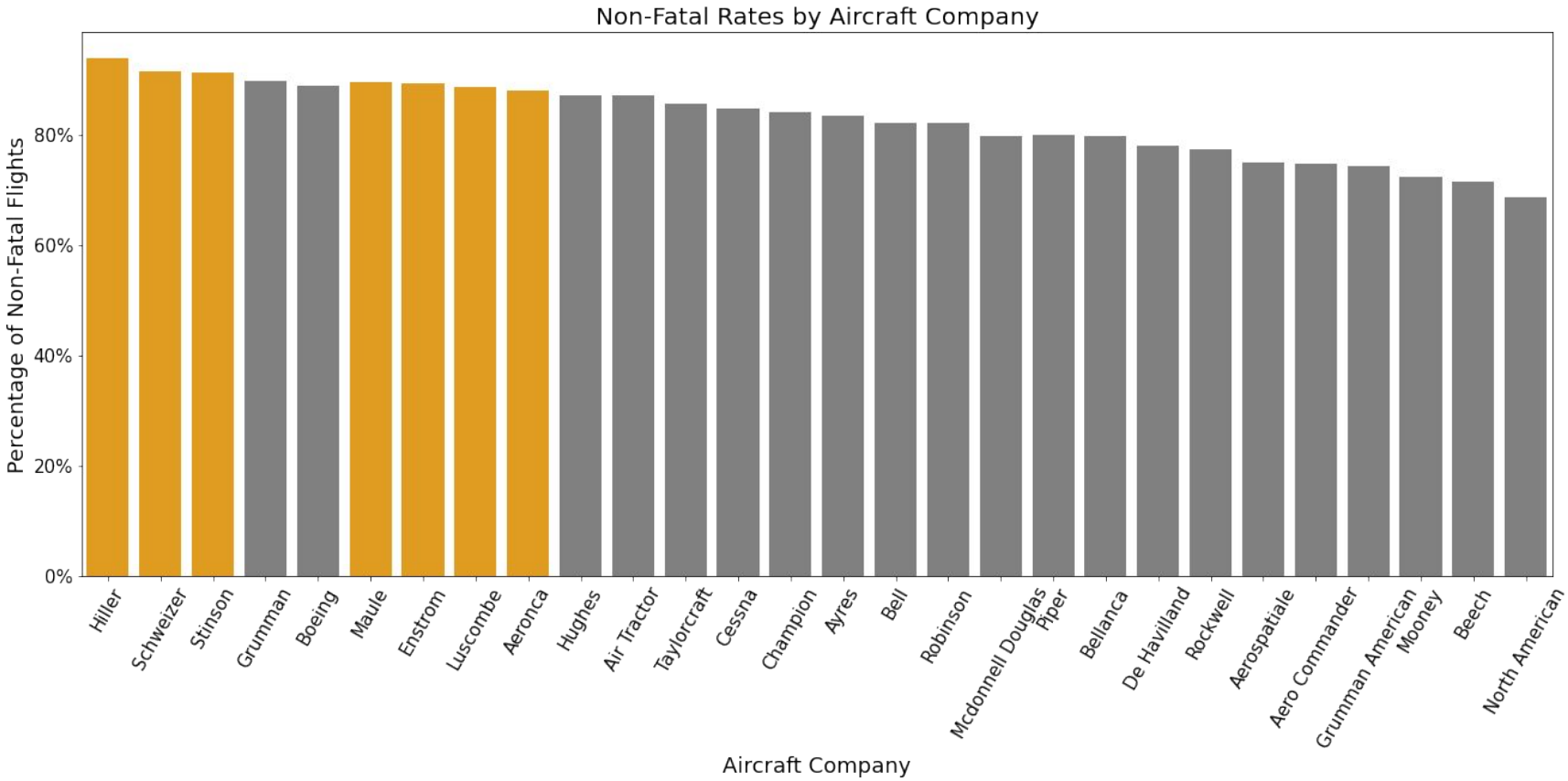
~98% of all accidents occurred in aircraft with 1 or 2 engines



Over 33% of all accidents occurred during either the Landing or Takeoff phases



7 aircraft companies are considered the least risky based on the metrics of Non-Fatal rate, Total Death Toll, and Deaths per flight



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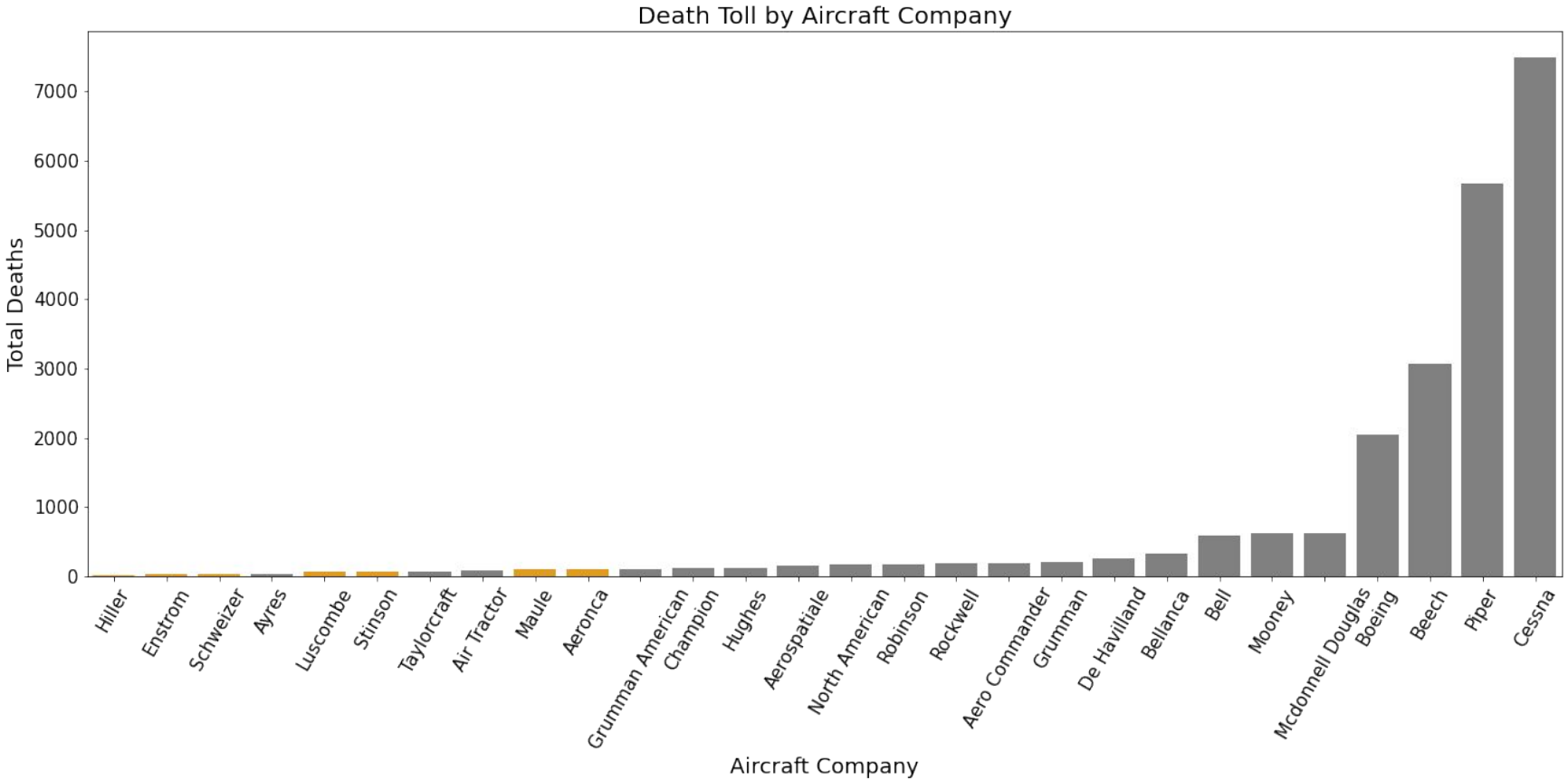

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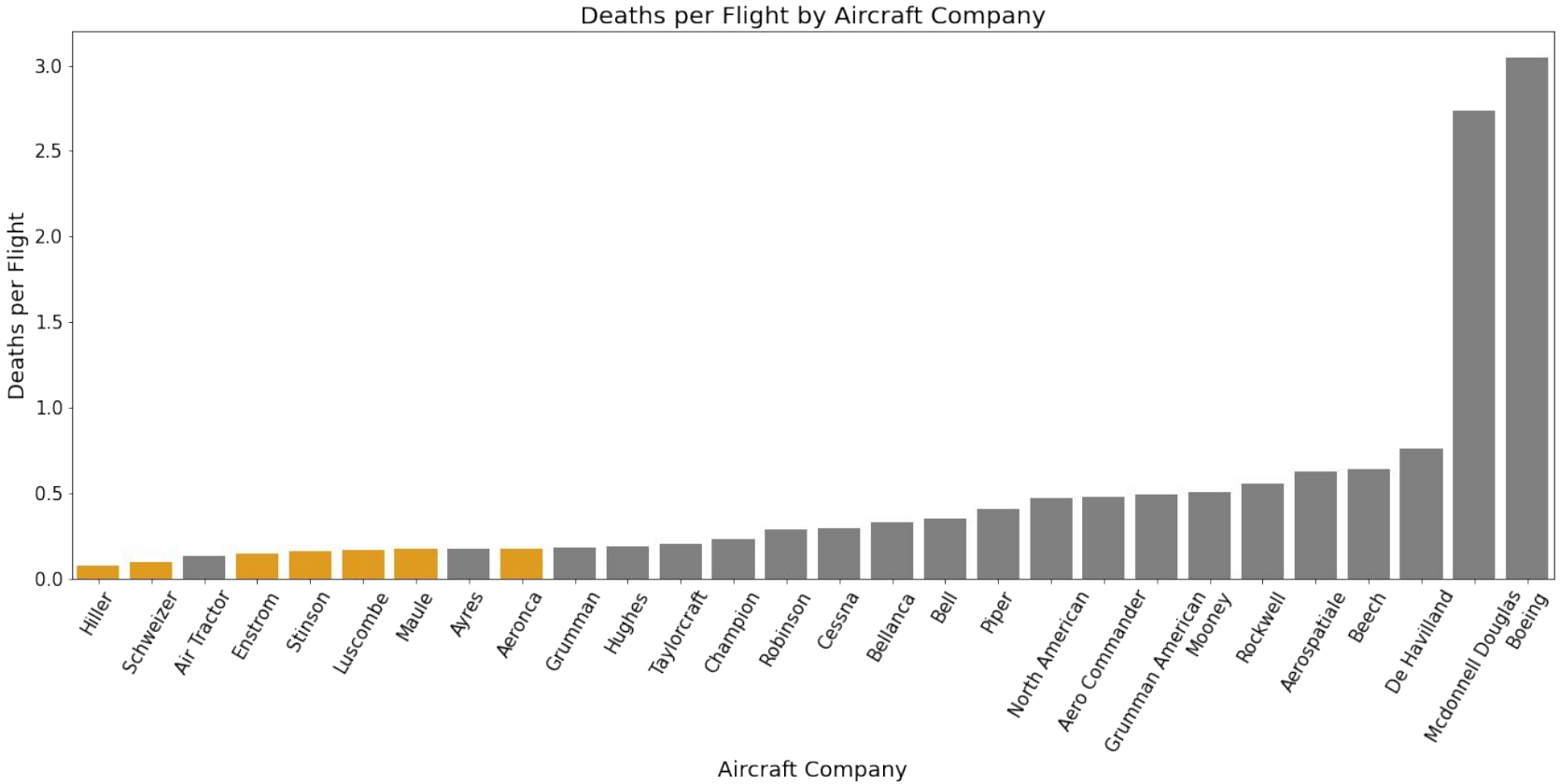


Limitations

- Analysis limited to making recommendations regarding the *least risky* aircrafts
- Least risky aircraft might not be the safest aircraft from the pool of all possible aircrafts
- Within this dataset, least risky = safest aircraft

Recommendations

Recommendation 1 Engines

Invest in aircraft:

- That have more than two engines
- Are ***not*** classified as a ‘reciprocating’ engine

Recommendation 2: Make

Select aircraft made by one of the following companies:

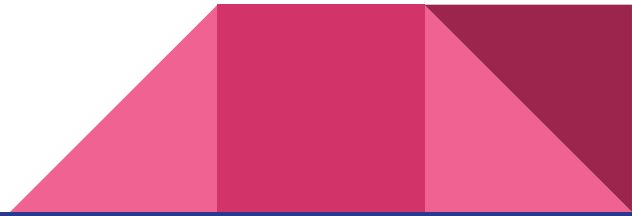
- Hiller
- Schweizer
- Stinson
- Maule
- Enstrom
- Luscombe
- Aeronca

Recommendation 3: Pilot Training

Focus training of pilots on the ‘Takeoff’ and ‘Landing’ phases

Next Steps

1. I would be interested in gathering and looking into two sets of data:
    a. price data for aircraft from the recommended companies
    b. pilot training program data



Thank you!

Github Repository:
https://github.com/ckucewicz/aircraft_safety_project

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