Aircraft risk assessment

Commercial and Private aircraft analysis

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Business Expansion Goals

- Exploring the potential of aircraft acquisition for portfolio expansion
  - Expanding into new industries and increasing diversification of company's existing lines of business.
- Analysis of aircraft by manufacturer and model
  - Understanding how the selection of aircraft may optimize our current method of transportation
  - Increase accuracy of preparation for entering into new industry
  - Attempt to identify the synergies that may arise from expansion of current portfolio

About Us

- We currently are a multinational company that invest in several industries sectors. Due to our long-term vision of maintaining growth for our stakeholders, we aim to keep risk as low as possible while striving to select business lines that has shown a growth trends which closely aligns with global economic cycles.
- Our latest expansion plans involves the purchase and acquisition of commercial and private aircrafts. Based on the outcome of our analysis, we will further proceed into qualifying which aircraft purchase combination strategy closely aligns with our current business strategy but also stay open to any potential evolution of our company that will further solidify our diversification of business's that decreases our risk exposure, increases our profitability and streamlines our operations.

Method of Analysis

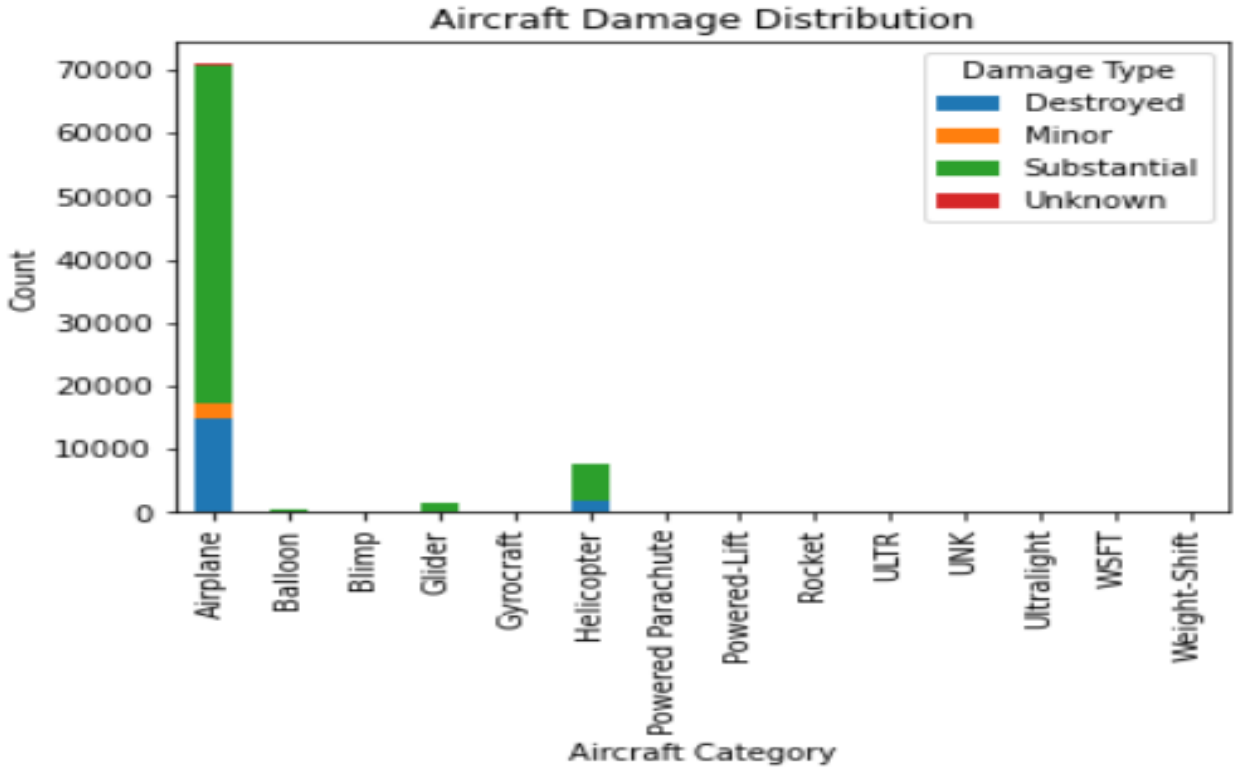
- Our approach to this analysis involves using publicly available data that has been collected over a period of 62 years (from 1962 to 2024) by the National Transportation Safety Board (NTSB) and is available on there aviation accident database.
- Statistical methods and Technologies used in this analysis will mainly be derived from the use of python programming language, pandas which is an open-source python library for data analysis and manipulation.
- We will also convey our findings with the use of visual representation of data and their relations in order to easily gain insight and make business decisions based on reliable information as much as possible. The visual representation will be created with another well known and reliable python library known as matplotlib. This technology allows its user to create static and interactive visualizations

Analysis

- We are concerned with answering the following questions:
  - which commercial aircraft has the highest and lowest risk
  - which private aircraft has the highest and lowest risk
  - what is the the survival rate of passengers on each type of aircraft
  - which manufacturer makes the lowest risk aircraft

which commercial aircraft has the highest and lowest risk

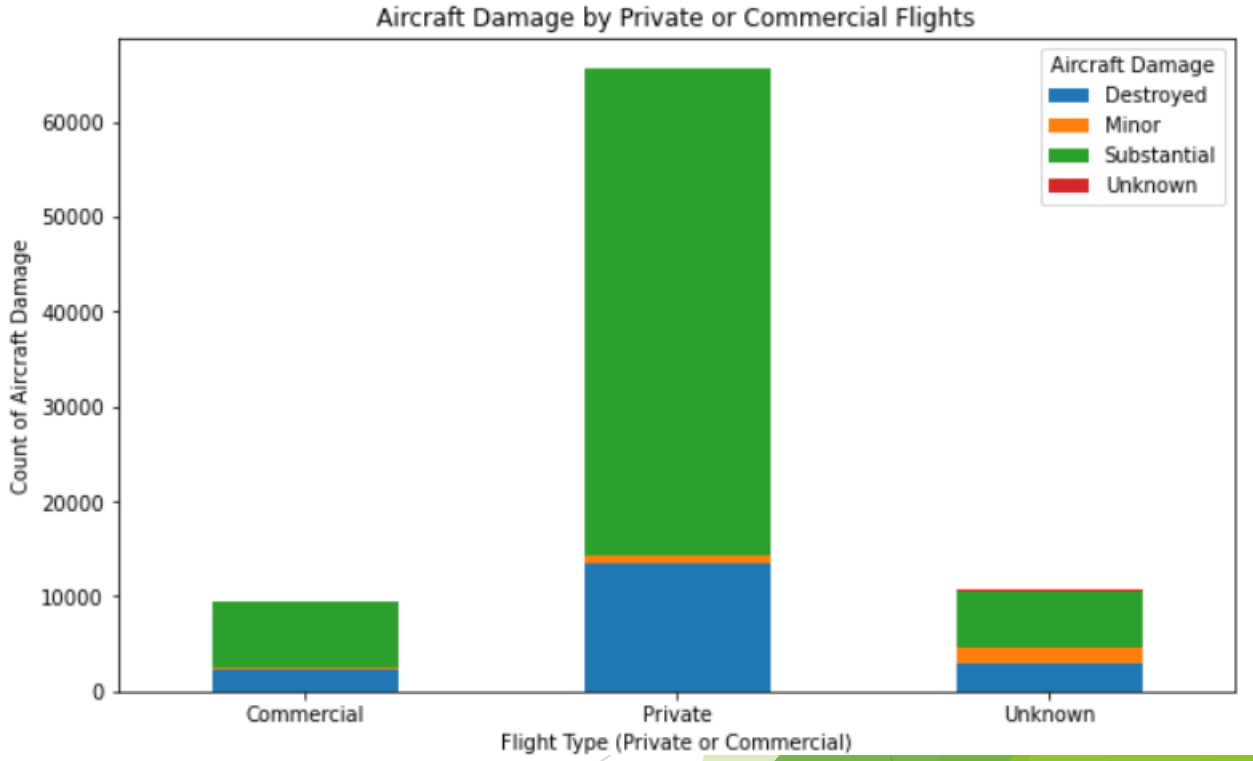
- Based on the analysis done on the available dataset, Airplanes have the highest risk. Risk is defined by Damage type which consist of three sub categories listed in order of most to least damage
  - Substantial
  - Destroyed
  - Minor



which private aircraft has the highest and lowest risk

Based on dataset, private and commercial use case has been attained by categorizing a ‘Purpose of use column’ between private and commercial. For example, personal, business, corporate were considered private. And ferry, aerial observation, banner tow were considered commercial.

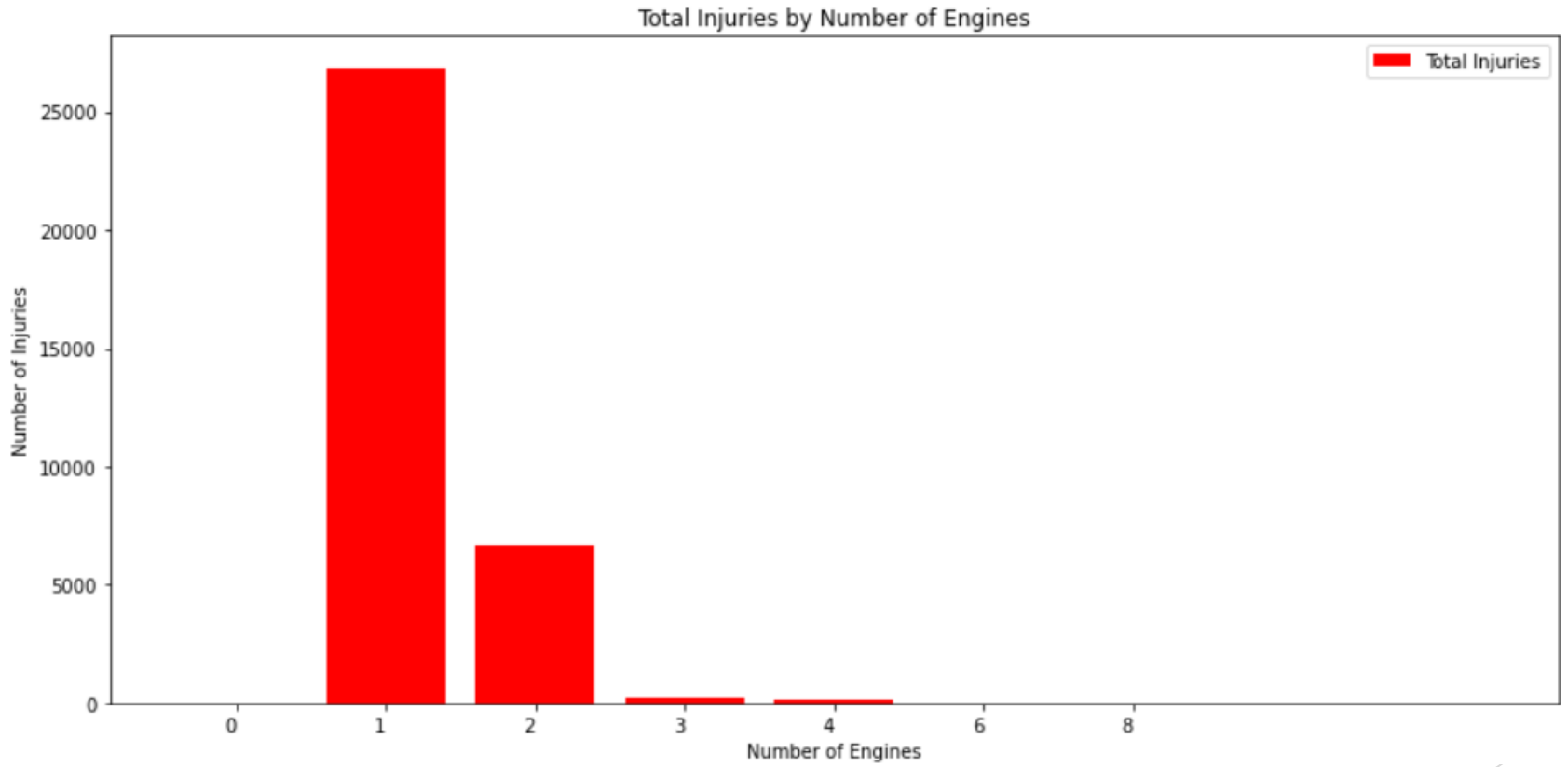
Private use has the highest damage rate compared to commercial



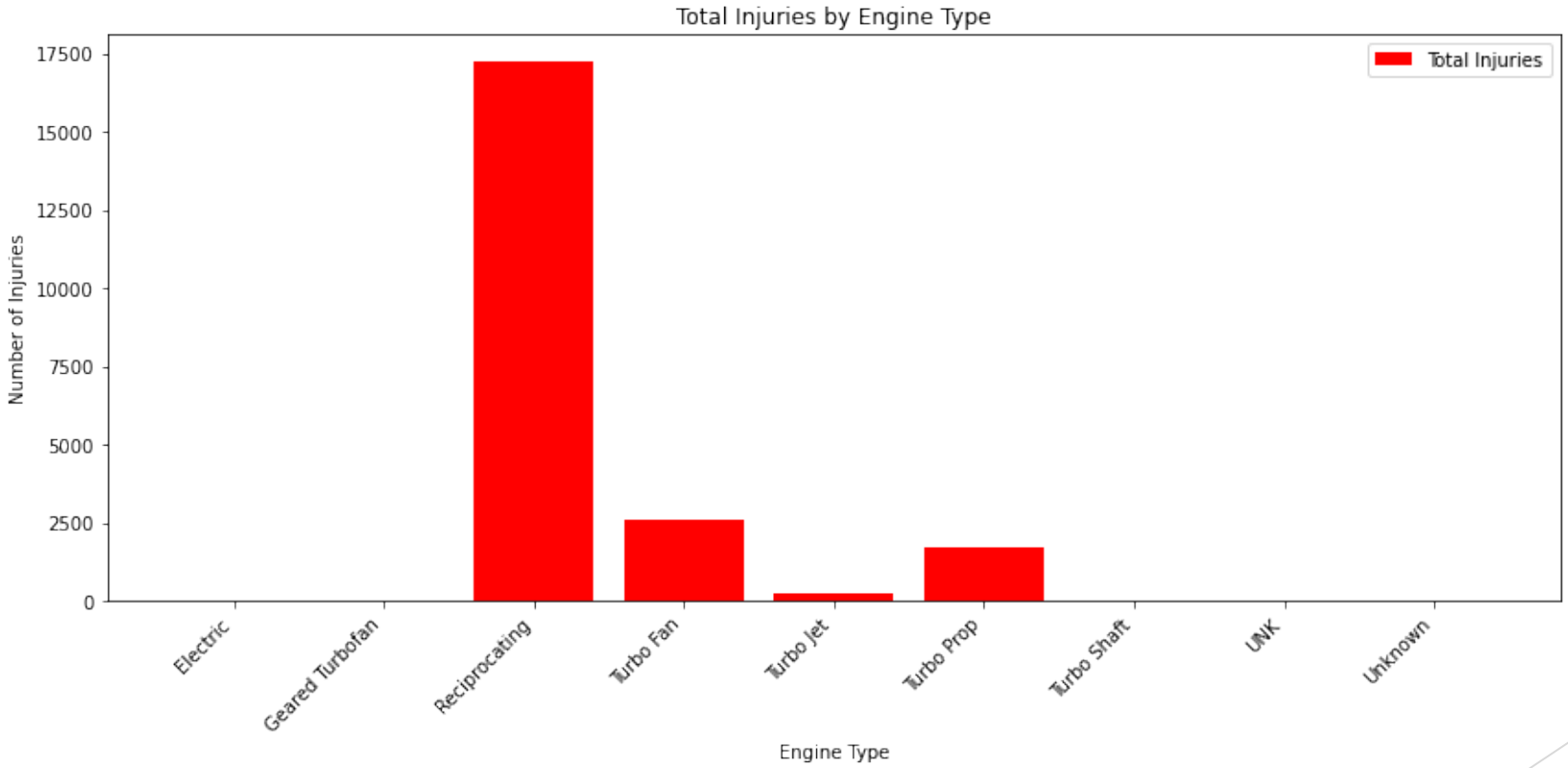
which manufacturer makes the lowest risk aircraft

- The dataset does not have data based on manufacturer directly, but does have data on make and model. These two fields can closely give us the answer we are looking for. Within this dataset there are too many makes so the number of engines were used as a substitute. It turns out that the single engine airplanes have the highest number of injuries. The dual engine airplanes are second place for this metric. This information shows that the dual engine aircraft is a better choice

Total injuries by Number of Engines



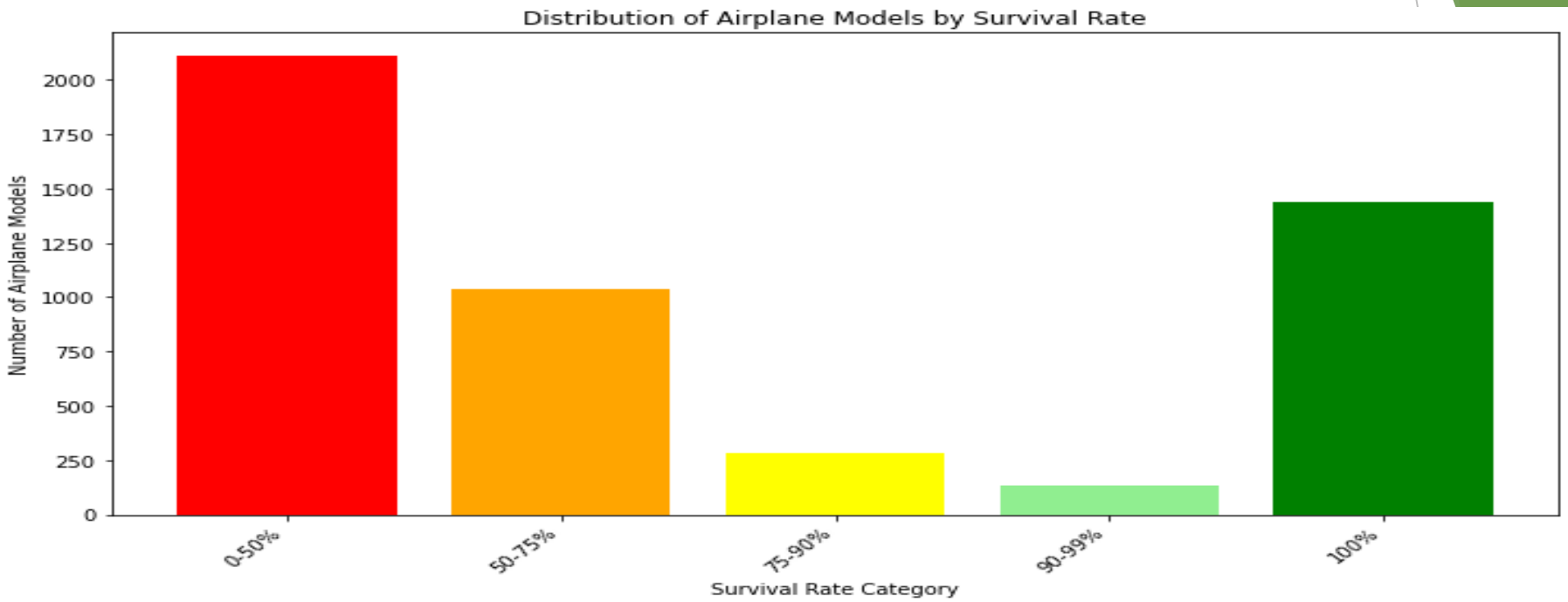
What engine type is the safest



what is the survival rate of passengers on each type of airplane Model

- Ultimately. The preservation of life is the most important metric that we should be concerned about. On the next slide shows the percentile distribution and what airplane models are in each percentile. From the 90-99% and the 100% should be the ones considered.

Survival rate by Models



Airplane Models by Survival Rate Category

Survival Category	Airplane Models
0-50%	SEA-ERA, EAGLE 540, EA300, Titan Tornado II, SE5-A...
50-75%	Lightning, PIETENPOL AIR CAMPER, PA46R, JR. SR, MD 11F...
75-90%	DC-3T, A 1B, PA 32-260, 525B, AA 5...
90-99%	777 - 236, A319 132, DC-9-82, 777-236ER, 320-200...
100%	HPL 1 HIGH WING PARA, BL, BT13, BT 15, BRISTELL S-LSA...

Conclusion

- Our analysis shows that the safest aircrafts for our business has the following features and combinations:
  - Airplane
  - Dual engine
  - Jet propulsion
  - Models:
    - 777-236, A319, DC-9-82, 777-236ER, 320-200
    - HPL 1 High Wing PARA, BL, BT13, BT 15, BRISTELL S-LSA

*this is a short list of models that fall into our category.