Low Risk Aircraft Assets for Business Ventures

Insights from Aviation Data Analysis

Introduction of Dataset

This data come from Kaggle provides NTSB aviation accident information from 1962 and later about civil aviation accidents. Dataset includes incidents within the United States, its territories and possessions, and in international waters.

Data up to date as of 2023.

Data source is from Kaggle.

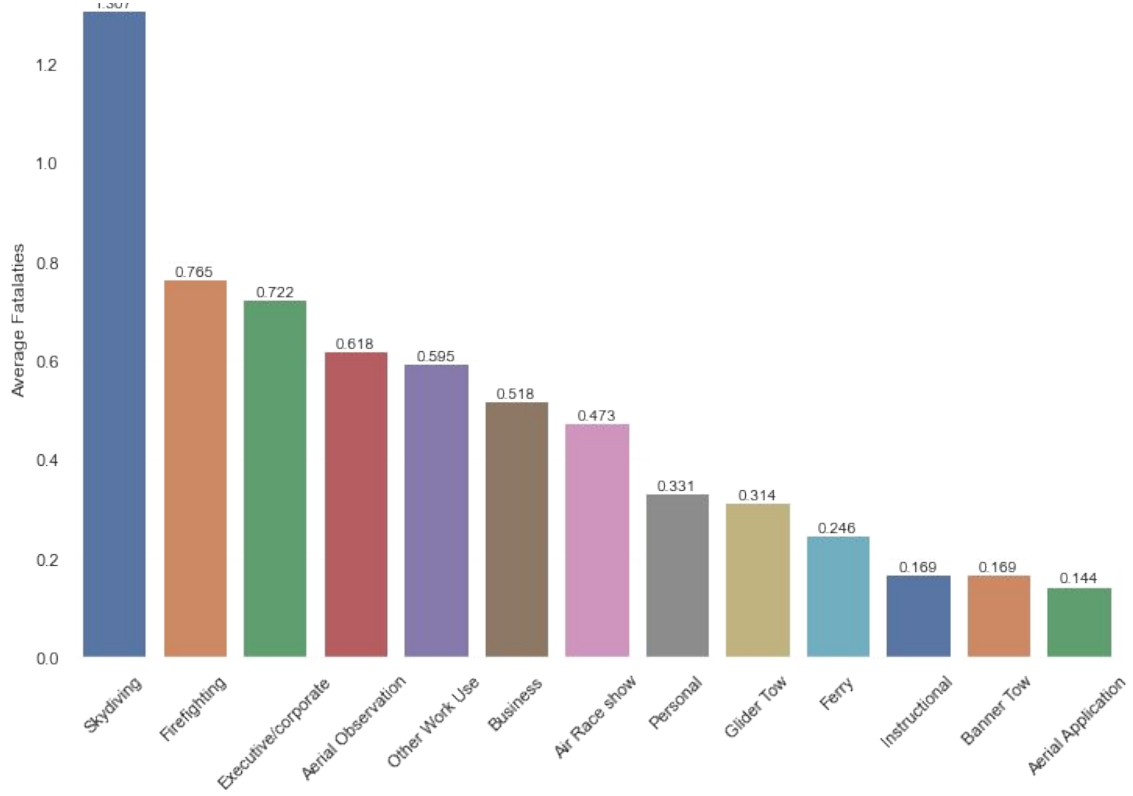
Goals of Data Analysis

- What types of flights have the highest average fatalities and damage to aircraft?

- What effect on safety do engines have and how much is this affected by weather?

- Which Make and Models have the lowest risk for commercial ventures?

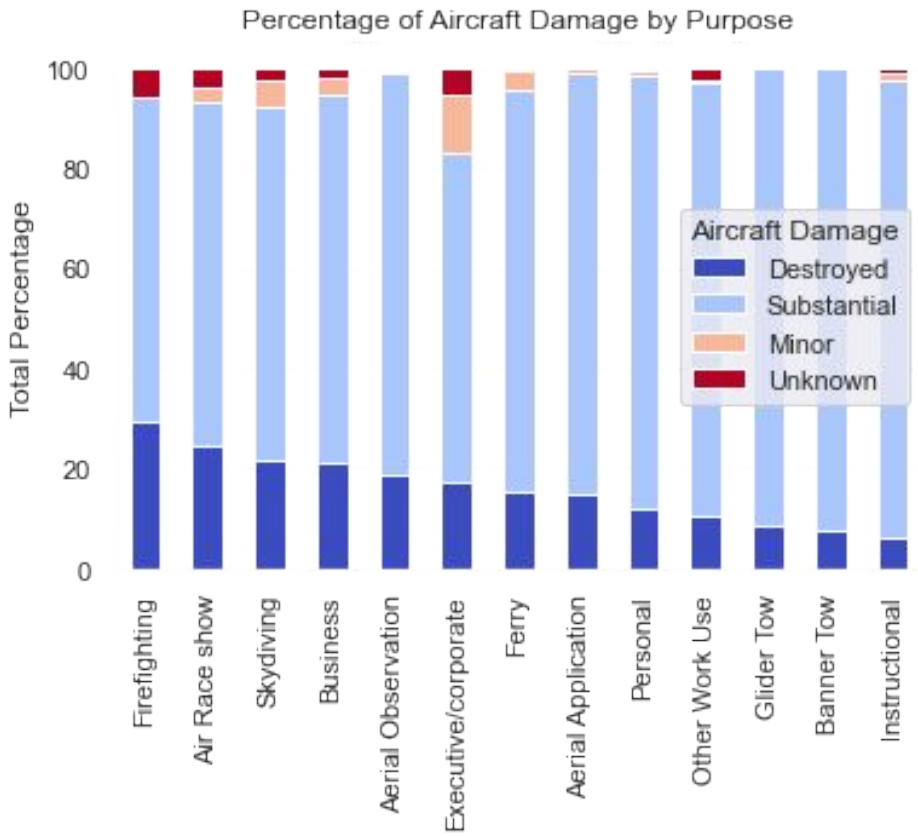
Understanding Fatality Rates Across Flight Types



- Shows average fatalities by flight purpose
- Higher fatalities per accident means higher insurance costs
- Applications with the least risk are:
  - Instructional
  - Banner Towing
  - Aerial Application

Aircraft Damage Across Flight Types

- Shows Aircraft Damage by flight purpose
- Applications with the least risk are:
  - Glider Towing
  - Banner Towing
  - Instructional



Engine Impact on Safety & Weather Influence

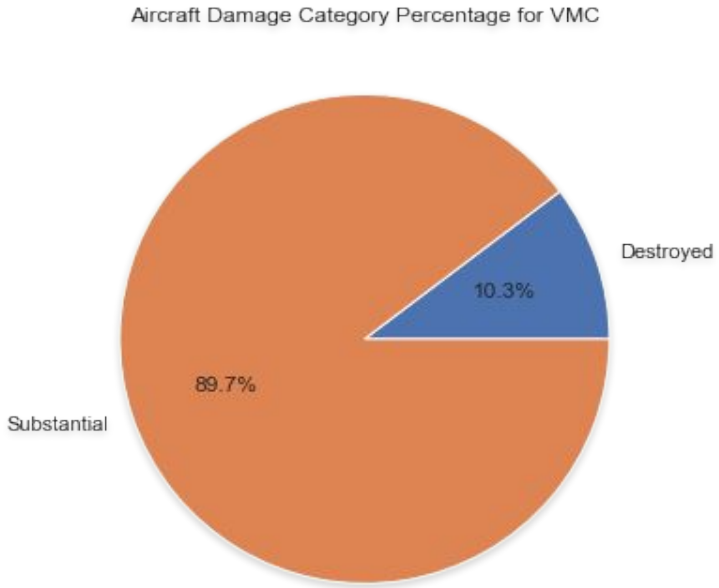
VMC(Visual Meteorological Conditions)

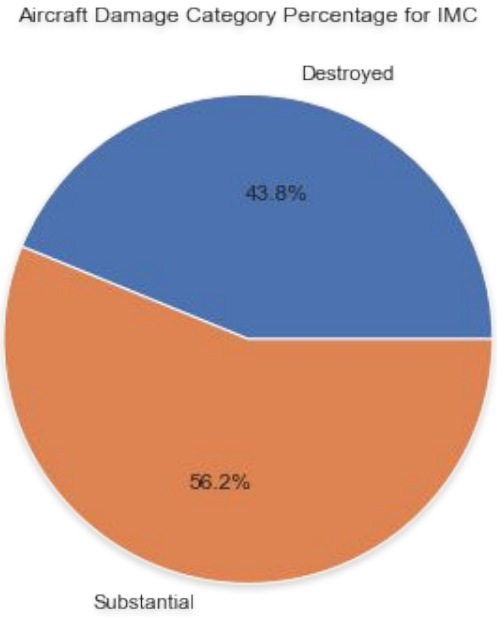
- Definition: Clear weather conditions that allow for visual flight.
- Visibility: Excellent visibility (>3 miles) with no restrictions on seeing terrain or other aircraft.
- Cloud Clearance: Minimum of 3 miles visibility and clear of clouds.

IMC(Instrument Meteorological Conditions)

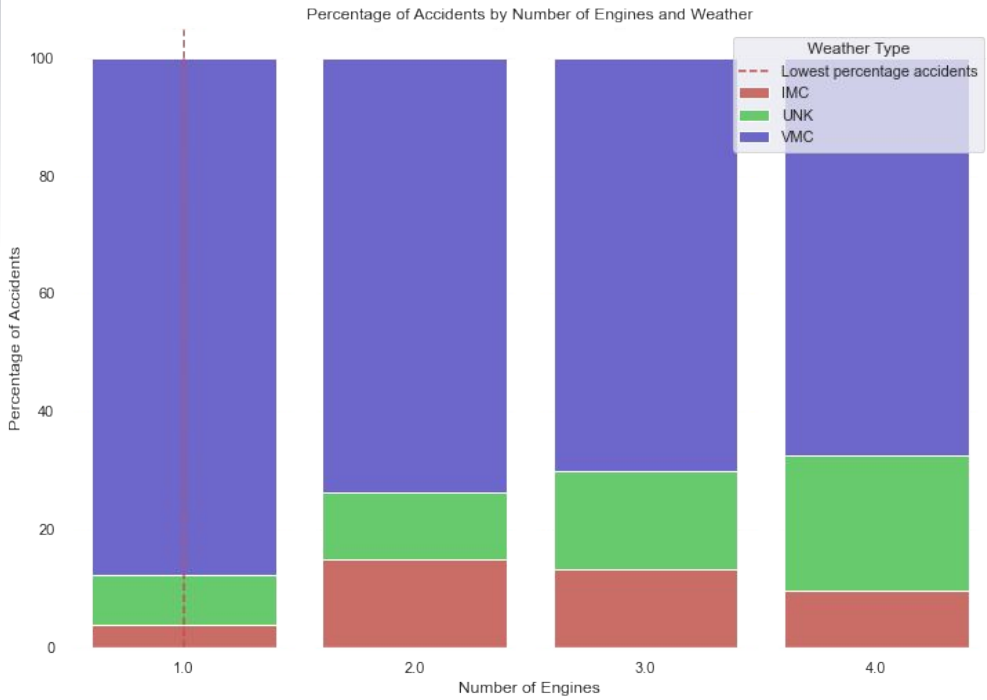
- Definition: Weather conditions where pilots primarily rely on instruments for navigation.
- Visibility: Reduced visibility (<3 miles) due to fog, rain, snow, etc.
- Cloud Clearance: Closer cloud clearance requirements, often relying solely on instruments.

Damage Caused by Weather





Total Number of Engines Impact on Weather Safety



Putting the Data Together

Combining all the data together a severity index was created using:

- Fatalities
- Serious Injuries
- Minor Injuries
- Flight Purpose
- Weather Safety
- Economic Loss

Low Risk Aircraft

- Analyzed the data to create a severity rating, constructing a data-powered scoring mechanism.
- The goal was to pinpoint the Aircraft makes and models posing the least risk, associating them with their respective business applications.
- The table displays the top 10 aircraft with the lowest risk.

Make	Model	Purpose	Accident Severity
ROCKWELL	114	Business	6.554
COLUMBIA	LC41-550FG	Business	6.554
TRUDEL	GP-4	Air Race show	6.419
DE HAVILLAND	DHC-3	Ferry	5.738
CESSNA	185	Ferry	5.738
CIRRUS	SF50	Ferry	5.738
PIPER	PA-32R	Instructional	5.507
AVIAT	F150-M	Instructional	5.507
TAYLOR	BC-65	Instructional	5.507
TTX AIR LLC	LANCAIR	Instructional	5.507

High Risk Aircraft

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Make	Model	Purpose	Accident Severity
LOCKHEED	LEARSTAR,-L-18-56	Skydiving	81.921
BEECH	65	Skydiving	79.921
BOEING	B17	Other Work Use	66.785
BEECH	C-45H	Skydiving	62.921
PIPER	PA31-350	Business	61.554
PIPER	PA-31T2	Business	61.554
MOONEY	M-20C	Instructional	60.507
LEARJET	25	Executive/corporate	58.166
CESSNA	560XL	Other Work Use	57.785
MITSUBISHI	MU-2B-30	Executive/corporate	57.166

Conclusion

Goal 1

Based on the data, skydiving, firefighting, and executive flights show the highest risk of fatalities, while instructional, banner tow, and aerial application activities demonstrate the least ris

Goal 2

The data suggests that a single-engine setup might be more conducive to surviving adverse weather conditions. The larger volume of data for single-engine aircraft likely contributes to its higher accuracy.

Goal 3

Utilizing a severity rating proved highly effective in consolidating the data into a numerical format. The amalgamation of data from our earlier objectives yielded valuable insights. Based on this analysis, we've formulated recommendations for 10 Make and Model combinations, each associated with a specific type of business.