Aviation Business: Opportunities and Risks

Data Analysis

Exploring New Aviation Business Lines

Business Flights with Airplanes

- **Target Audience:** Business executives, corporate teams, high-net-worth individuals.
- **Benefits:** Flexibility, time-saving, personalized services.

Business Flights with Helicopters

- **Target Audience:** Business professionals, tourists, short-distance travelers in urban areas.
- **Benefits:** Access to remote locations, reduced travel time, scenic routes.

Flights for Skydiving

- **Target Audience:** Thrill-seekers, tourists, adventure sports enthusiasts.
- **Benefits:** Unique experience, growing adventure tourism market.

Data used

The National Transportation Safety Board aviation accident dataset

National Transportation Safety Board

The National Transportation Safety Board website - ntsb.gov

Data on accident: Date, type, location, make, model, purpose of flight, aircraft damage, passengers fatality, weather conditions, airport location and code, aircraft category etc.

Removed Data: Ameteur aircraft, NaN value rows, 1982, USA only, coordinates, investigation type, schedule, airport code, airport name, air carrier.

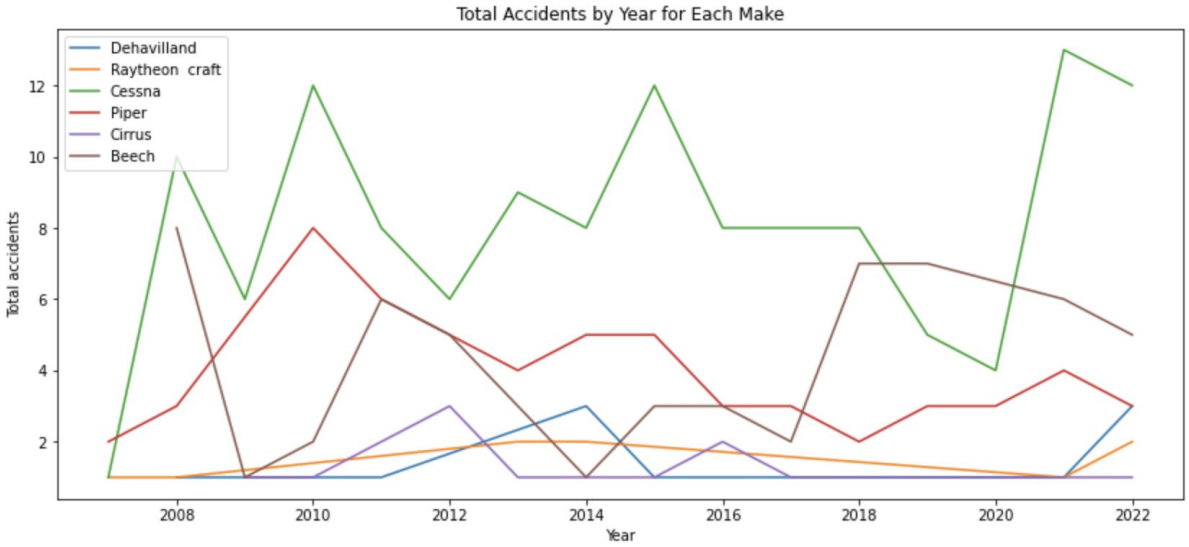
Initial Dataset: 88889 rows, 31 columns
Filtered Dataset: 18167 rows, 22 columns

Process Steps

Business flights

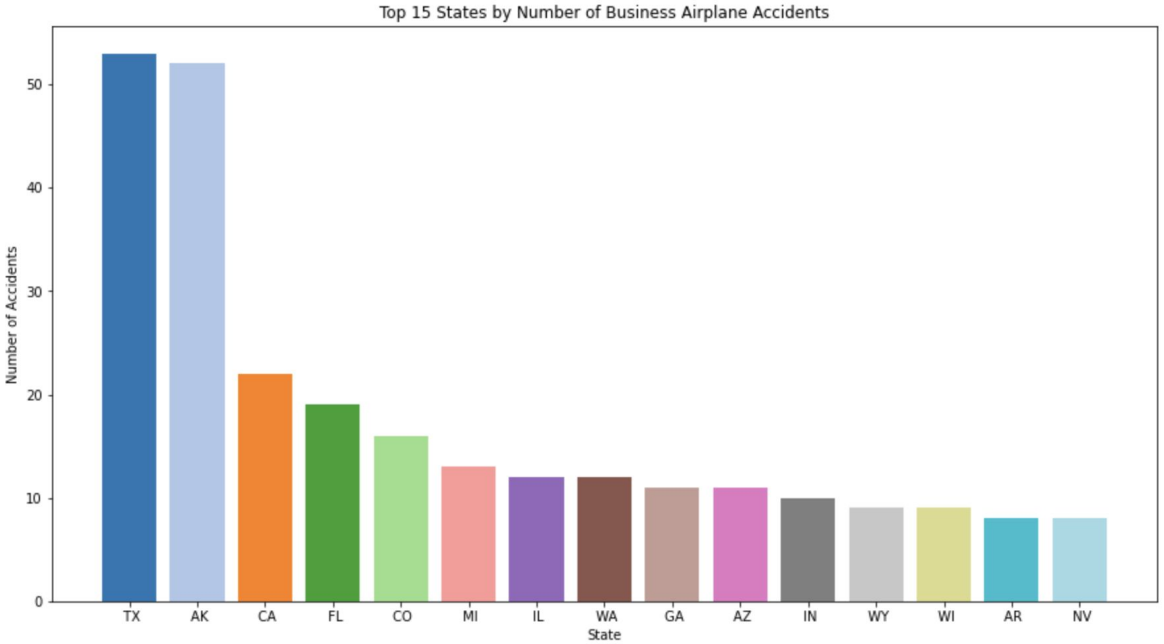
- Business aviation industry in the U.S. is $150 billion.
- Employs over 1.2 million people.
- Compound annual growth rate (CAGR) of 4.46%.

Business flights - Airplanes



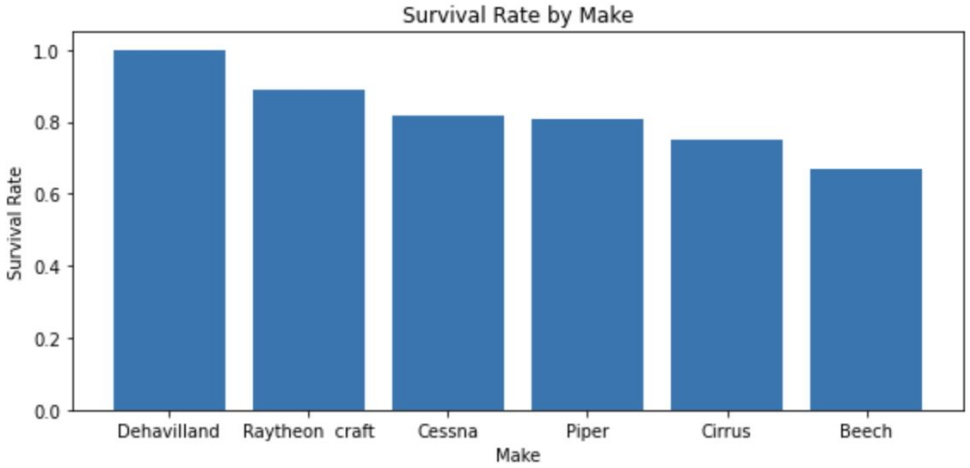
No clear trend in any manufacturer in number of accidents over the last 15 years.

Business flights - Airplanes



States with higher risks of accidents: Texas, Alaska, California, Florida.

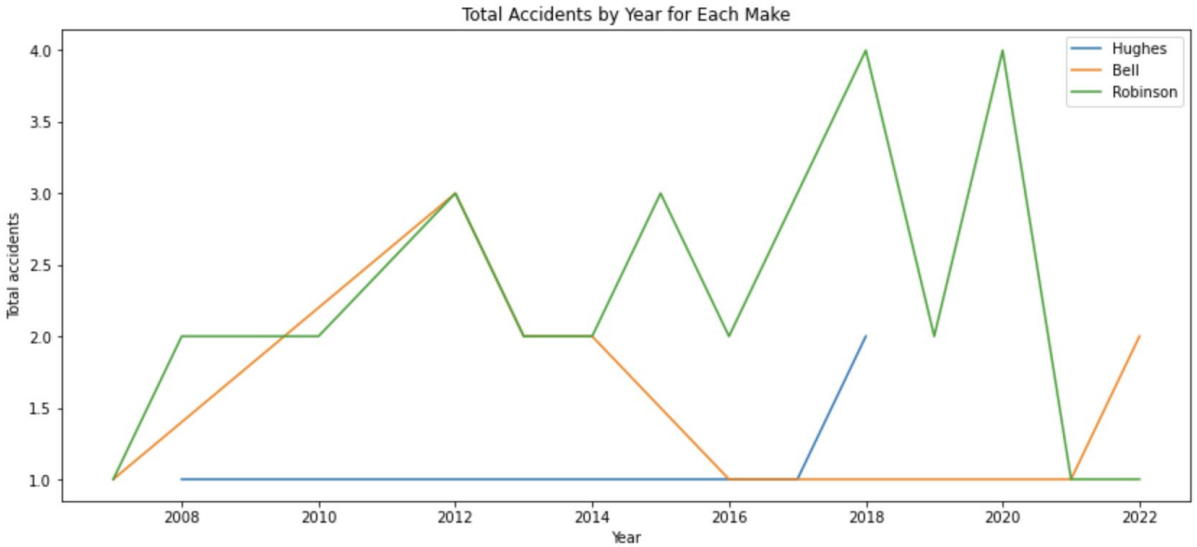
Business flights - Airplanes



Airplanes Models to consider:

- Piper - M350 and M500 (formerly PA-46).
- Cessna - Citation line, Model 525 and 700.
- Cirrus - SR 22.

Business flights - Helicopters



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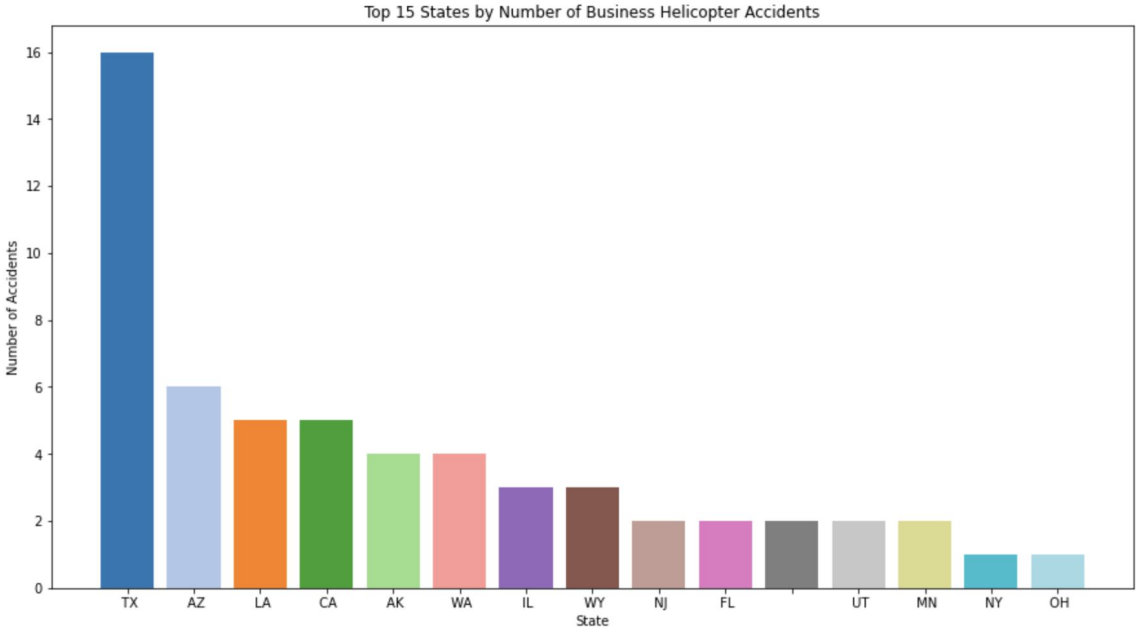
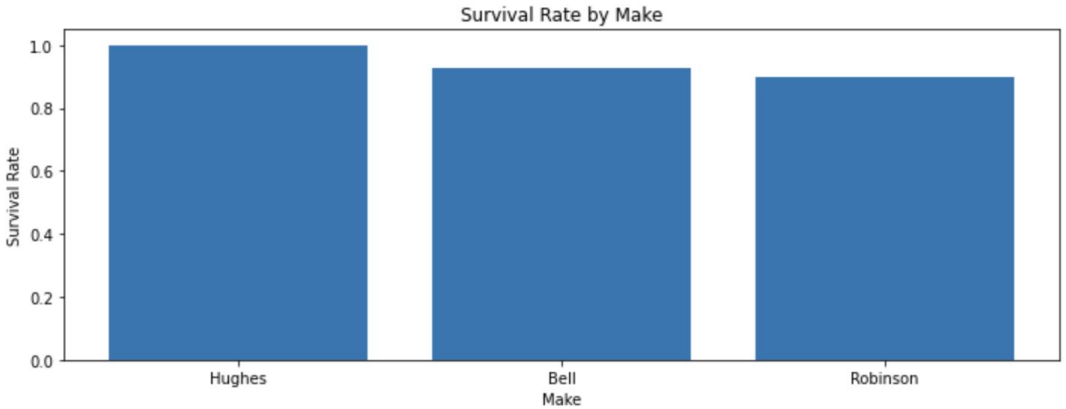
Business flights - Helicopters



States with the highest risks for helicopter flights:

Texas, Arizona, Alaska, California, Louisiana, Washington.

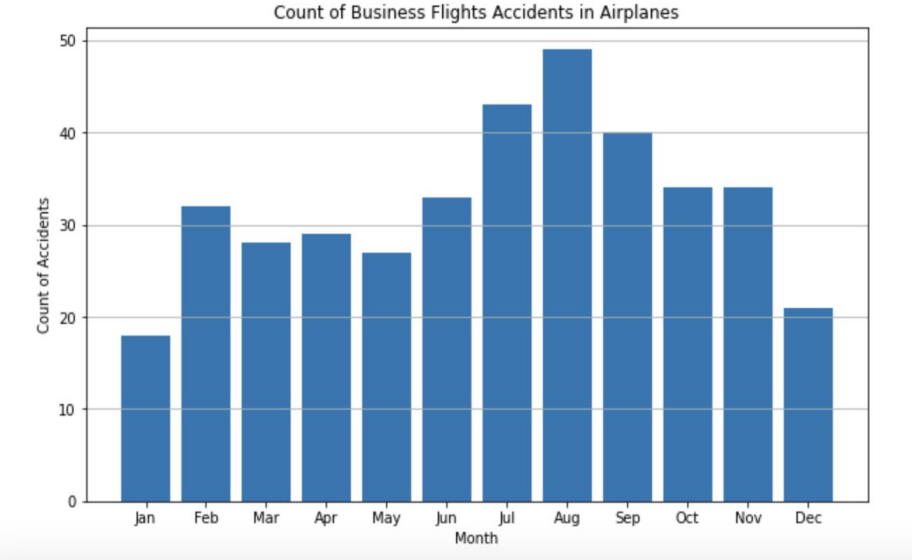
Business flights - Helicopters



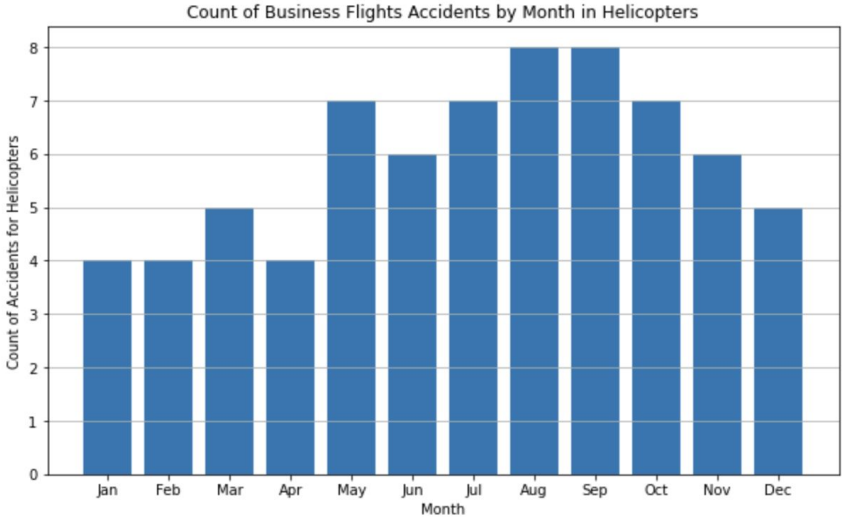
Helicopters Models to consider:

- Robinson R44 and R44 II.
- Bell 407.

Business flights



July and August are higher risk months, lowest risk are December and January.

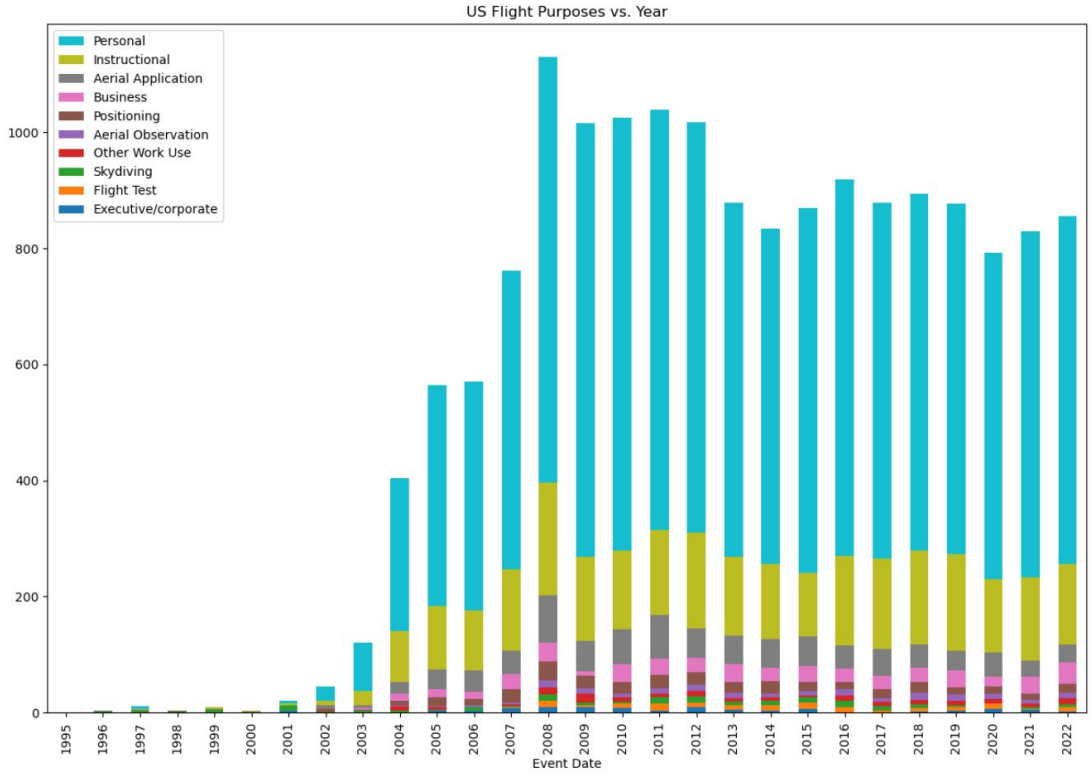


August and September are higher risk months, lowest risk are December through April.

Skydiving

Market Share

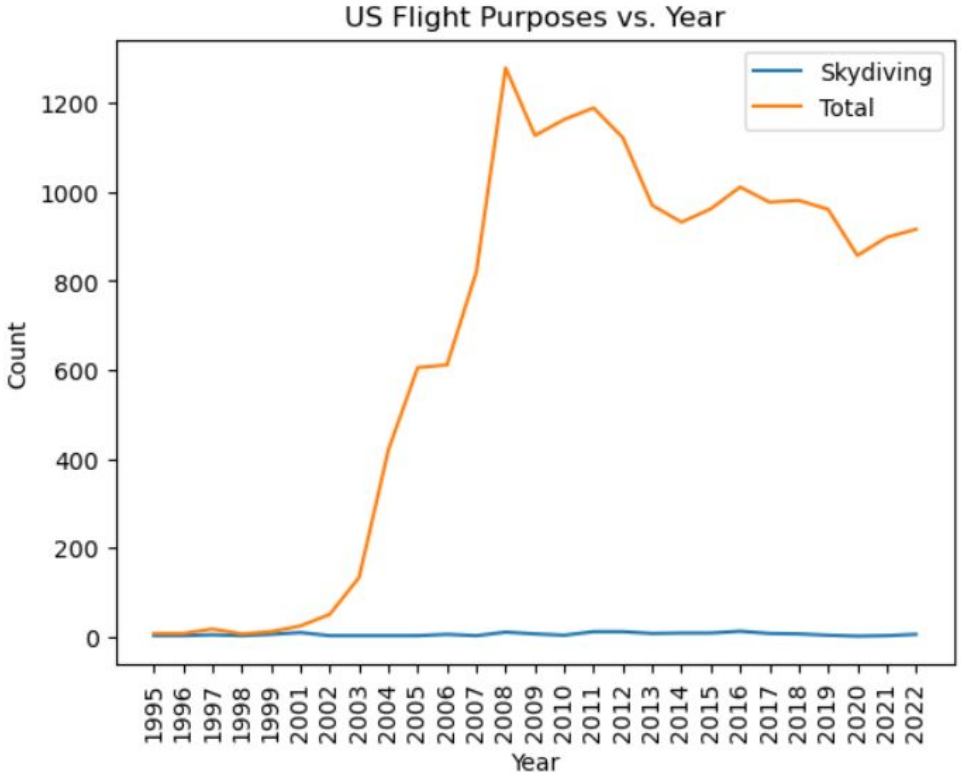
- 8th most common flight purpose in the dataset
- The skydiving industry is worth $ 11.5 billion as of 2023
- Projected to have an annual growth rate of 16%



Skydiving

Market Share

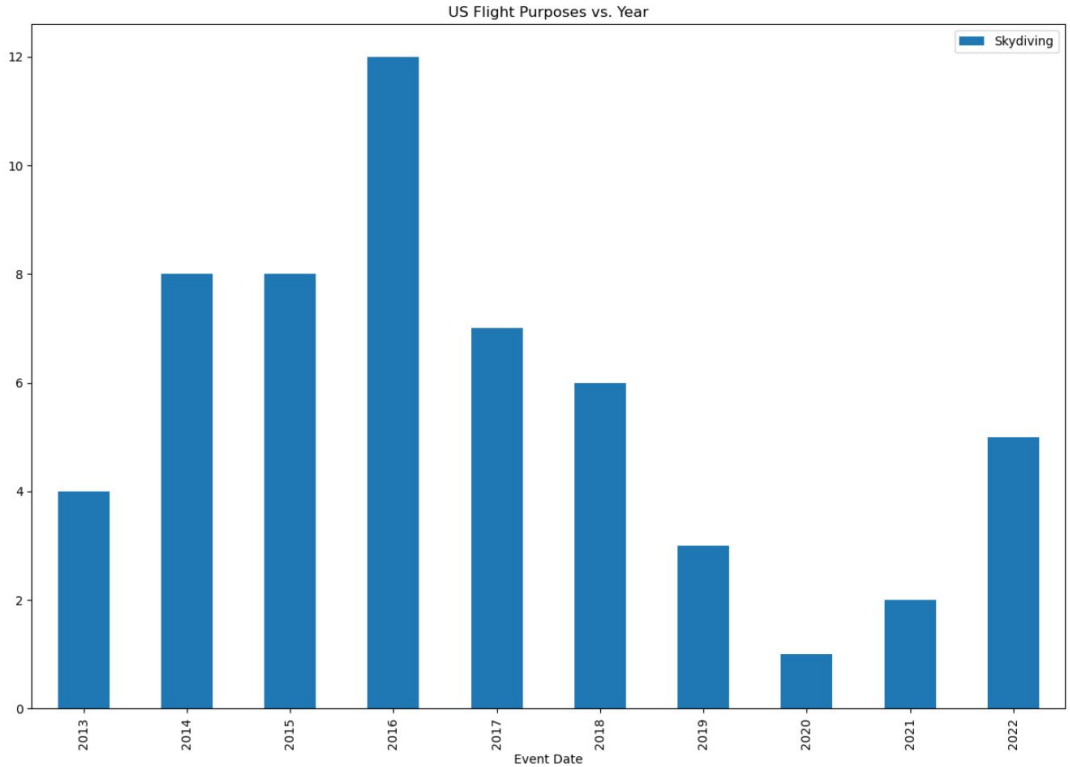
- The skydiving market has not seen a significant increase in crashes when compared to the rest of our dataset.
- Assuming that crashes are proportional to the total number of flights, the market hasn't seen any significant growth in the last two decades



Skydiving

Market Share

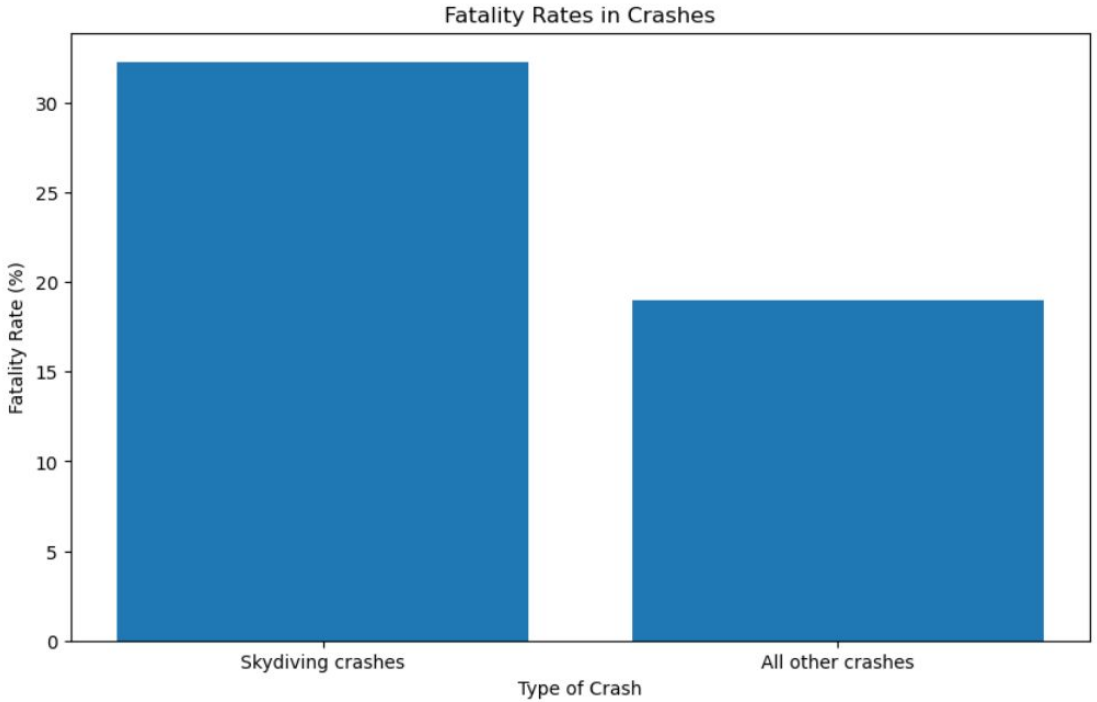
- Crash rates have increased since 2020.
- No significant change in crash rates over the last decade.



Skydiving

Fatalities

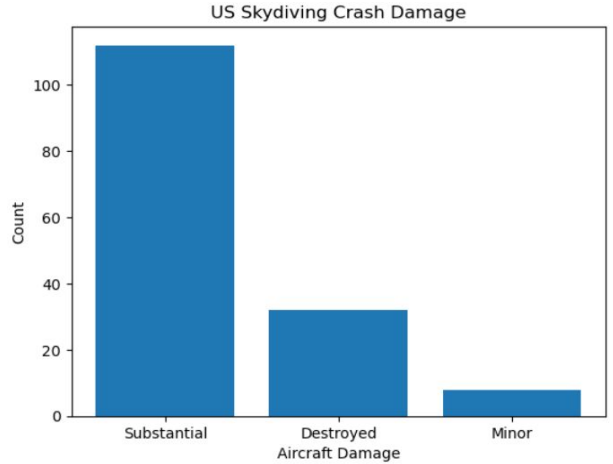
- Significantly higher fatality rates when compared to the rest of the flight purposes.
- Skydiving crashes have a fatality rate of 32.3%.
- All other crashes combined have a fatality rate of 18.96%.
- Skydiving accidents result in 1.7x more fatalities than all other crashes combined.

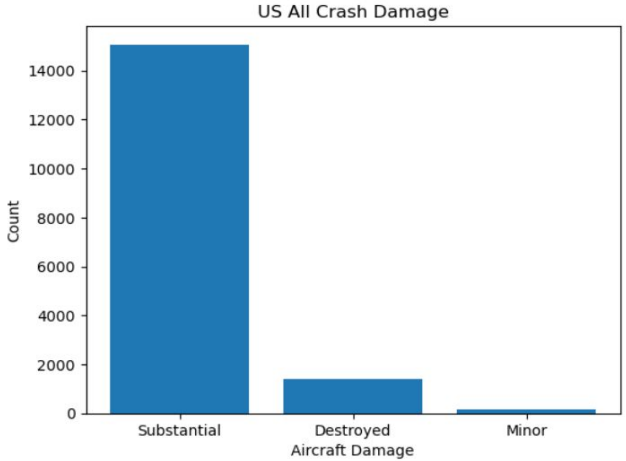


Skydiving

Crash Damage

- Skydiving crashes result in 21% destroyed aircraft
- All other crashes result in 8.3% destroyed aircraft



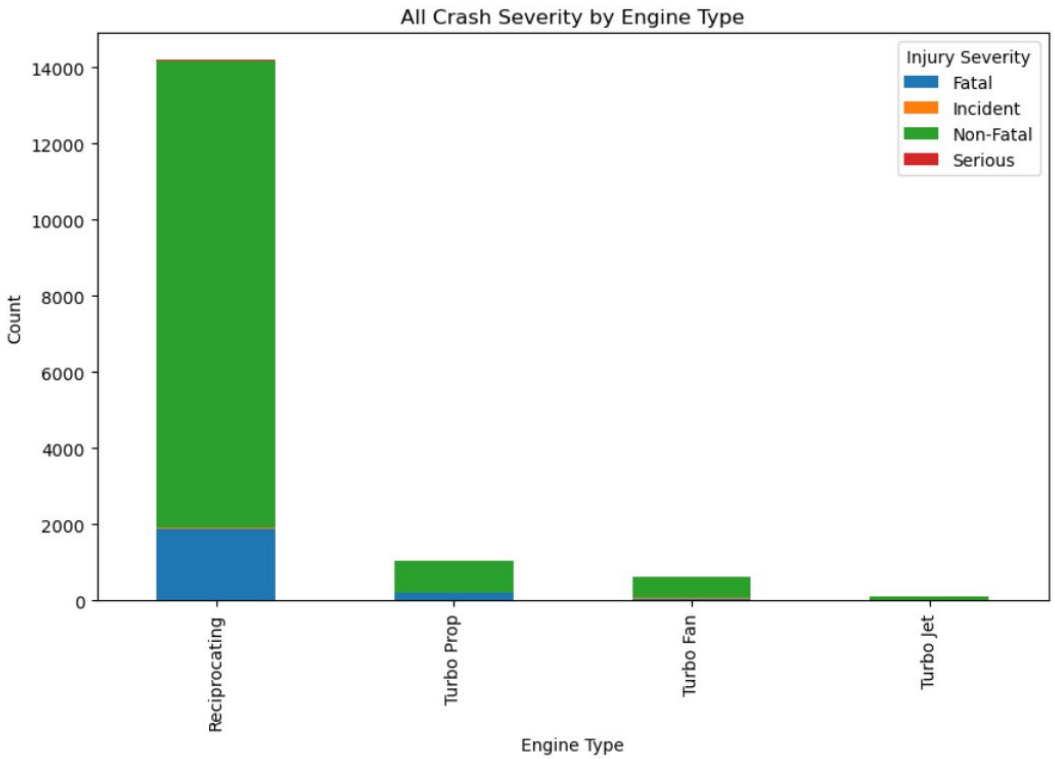


Skydiving

Engine Type - All Crashes

- Out of all crashed aircraft in the dataset, the most common engines were reciprocating and turboprop.
- 89% of all crashes had reciprocating engines.
- Turboprops had the highest fatality rate of 20%.

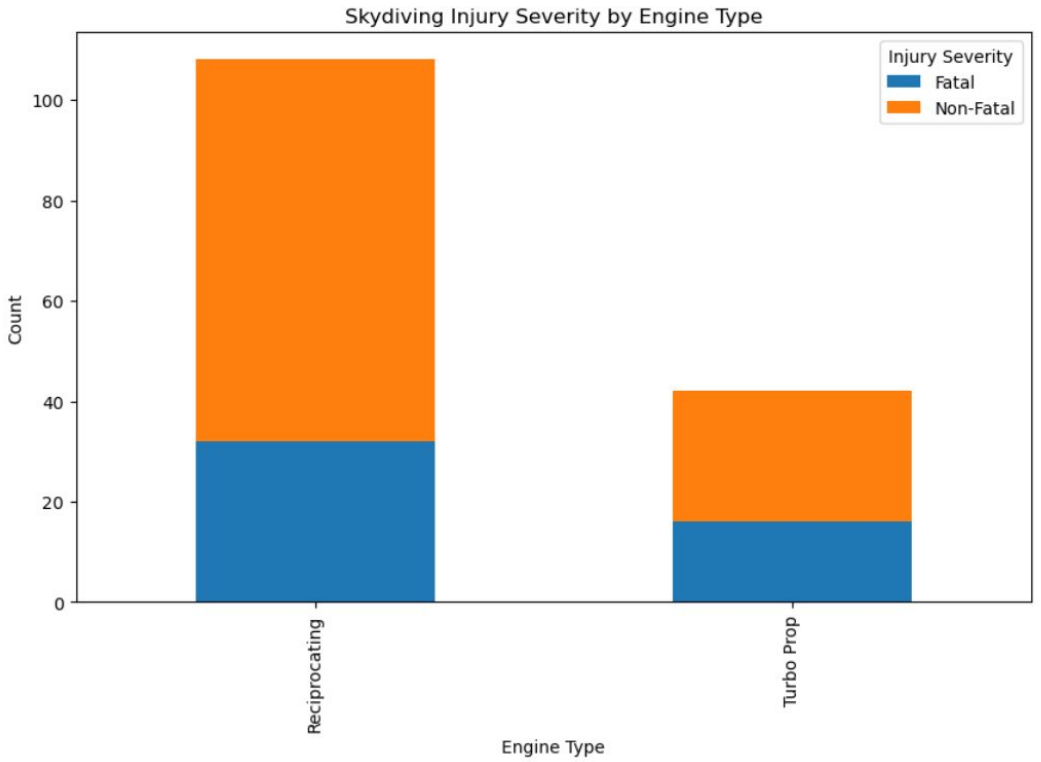
Injury Severity	Fatal	Incident	Non-Fatal	Serious
Engine Type				
Reciprocating	1894	14	12260	16
Turbo Prop	210	5	831	2
Turbo Fan	43	24	546	1
Turbo Jet	22	5	88	0



Skydiving

Engine Type - Skydiving

- All US skydiving planes in our dataset were equipped with reciprocating and turboprop engines.
- Reciprocating engines have a 28.8% fatality rate, and Turboprop engines have a 39.5% fatality rate.
- These percentages are much higher than all other aircraft fatality rates with the same engines.
- Turboprop fatality rate is nearly double when compared to the rest of the dataset



Recommendations

Airplane Business Flights

Models to consider:

- Piper - M350 and M500 (formerly PA-46).
- Cessna - Citation line, Model 525 and 700.
- Cirrus - SR 22.

States with higher risk to avoid: Alaska, Texas.

Summer is a high risk season, winter is best to start as its low risk season.

Helicopter Business Flights

Models to consider:

- Robinson R44 and R44 II.
- Bell 407.

States with higher risk to avoid: Texas, Arizona.

Summer is a high risk season, winter is best to start as its low risk season.

Skydiving flights

Not recommended

- Very high fatality rate.
- Small market.
- Complete destruction of the aircraft is significantly more common.

What's next

Market Research

In-depth analysis of market trends and customer preferences

Profitability

Evaluation of potential revenue streams and cost management

Operational Feasibility

Assessment of logistics, safety, and regulatory requirements.

Analysis extension ideas

Additional data

Analyze the total flight hours to understand accident rates per flight hour/mile flown.

Additional subjects

Look at the correlation between the age of the aircraft and accident rates.

New opportunities

Explore other business ideas within given data set

Thank you!

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