Aircraft Safety Analysis for Business Expansion

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Project Overview: Aircraft Risk Analysis

As part of a plan to enter the aviation sector, this project analyzes aircraft accident data to support safe and informed investment decisions.

Using key factors like engine type, injury severity, flight phase,and aircraft damage, we identify risk patterns across aircraft models and operating conditions.

The goal is to guide stakeholders in selecting safer aircraft, improving pilot preparedness, and reducing operational risks.

 BUSINESS UNDERSTANDING

As a strategic plan to diversify its portfolio, our company plans to enter the aviation industry by purchasing and operating airplanes for commercial and private enterprises.

However, the company currently lacks knowledge regarding the potential risks associated with different types of aircraft.

This project aims to provide a data-driven evaluation of various aircrafts to guide the company in making informed purchasing decisions.

🎯 GOALS

- **Identify aircraft with the best safety, cost-efficiency, and performance.**
- **Evaluate risks based on accident history, maintenance, and manufacturer reliability.**
- **Recommend aircraft suited to the company's operational strategy.**

DATA UNDERSTANDING

The dataset used for this analysis provides a historical record of aviation accidents and safety incidences recorded from various regulatory bodies.

The dataset contains detailed information on aircraft accidents, injuries and aircraft types that provide an ideal understanding of the safety profiles of various aircrafts which is in line with our project's objective to identify the *lowest risk aircraft* for purchase.

KEY COLUMNS

The following columns are key to assessing the aircraft's safety and risk:

- **Total.Fatal.Injuries: The number of fatalities in the accident.**
- **Total.Serious.Injuries: The number of serious injuries in the accident.**
- **Total.Minor.Injuries: The number of minor injuries in the accident.**
- **Aircraft.damage: The extent of damage to the aircraft (e.g., Substantial, Destroyed).**

KEY COLUMS CONT

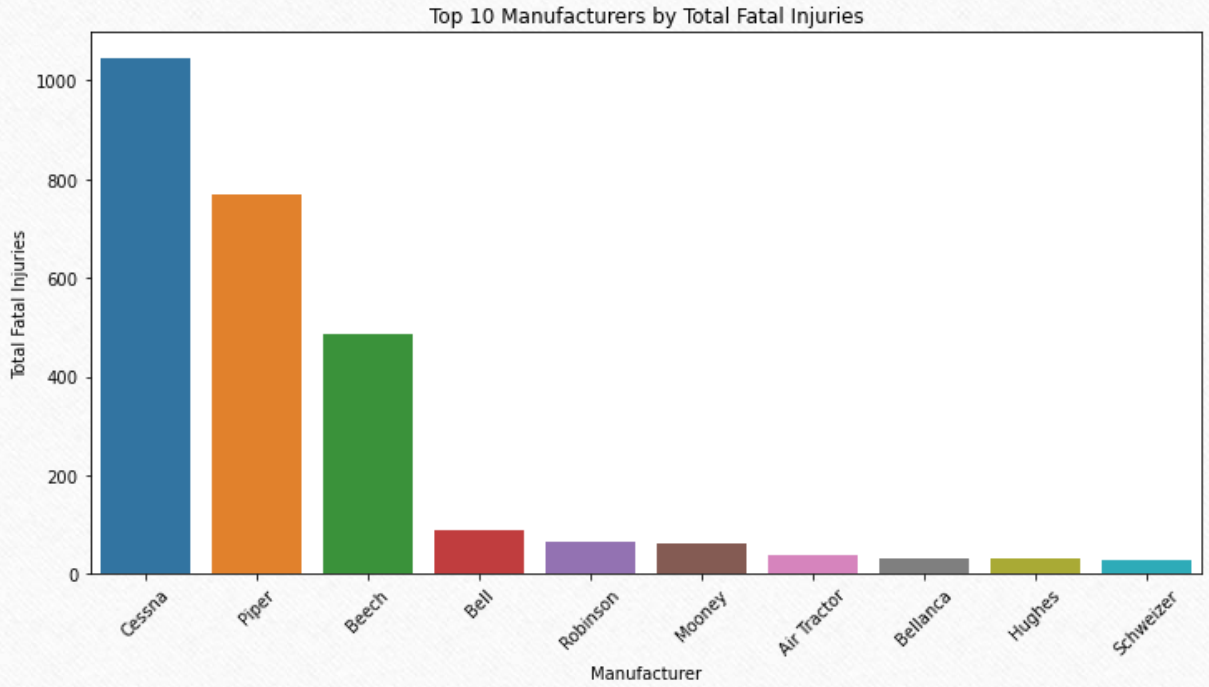
- **Make: The manufacturer of the aircraft.**
- **Model: The specific model of the aircraft.**
- **Engine.Type: The type of engine (e.g., Turbofan, Piston).**
- **Broad.Phase.of.flight: The different stages during which the aviation accident occurred.**

DATA ANALYSIS AND VISUALIZATION

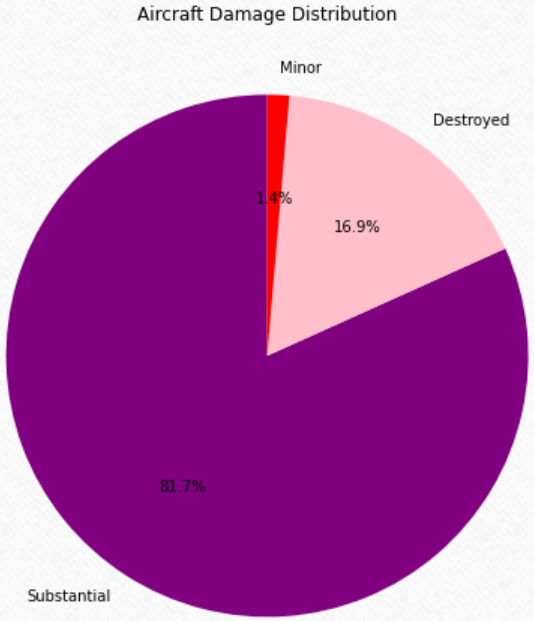
In this section we are going to ;

- **Identify which aircraft categories have the most accidents and which have the least.**
- **Calculate the average number of fatalities for each aircraft make.**
- **Identify which engine linked to the highest crash accidents**

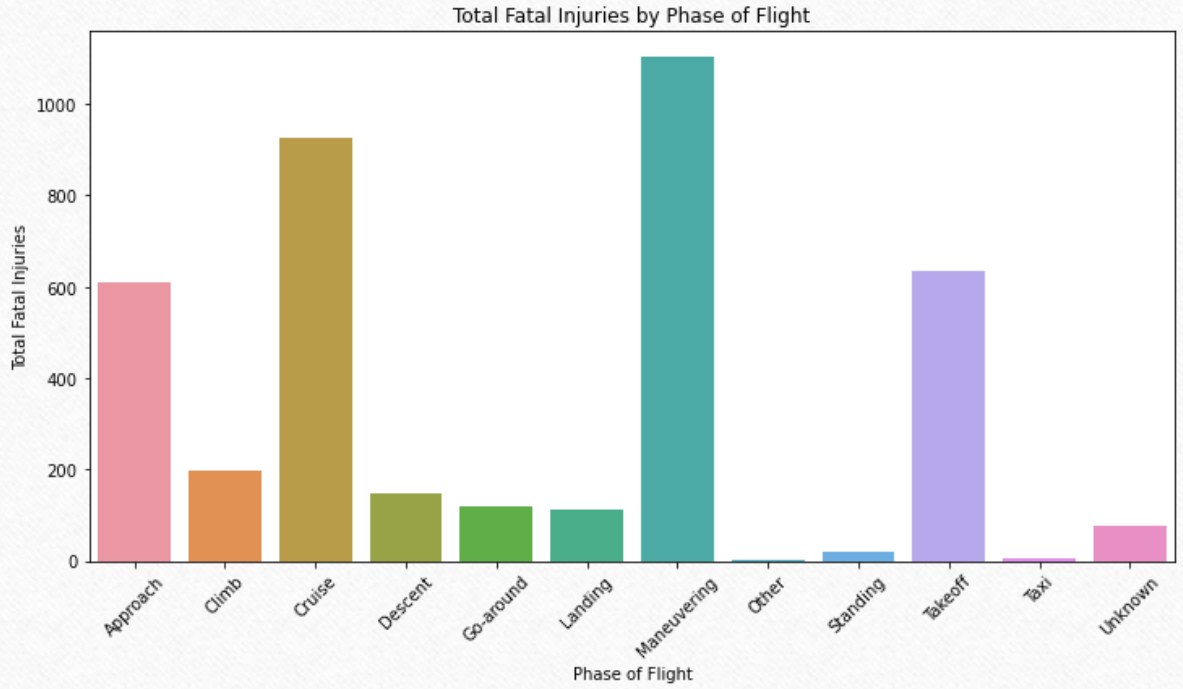
which aircraft categories have the most accidents and which have the least?



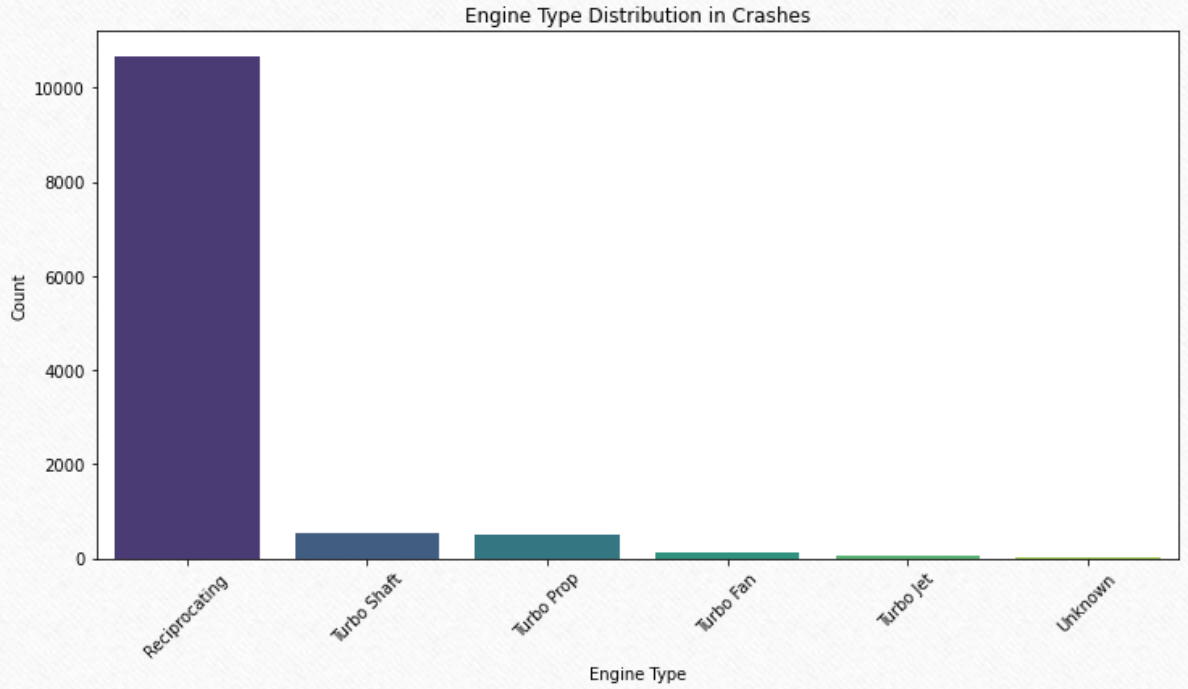
Aircraft Damage Per Accident



Fatalities by phase of flight



Engine linked to the highest fatalities



🔑 RECOMMENDATIONS

- **Invest in Reliable Engine Types**

Favor turbofan or turbine-powered aircrafts for both commercial and private operations.

- **Strengthen Pilot Preparedness - Focus training efforts on cruising and maneuvering, which pose the highest risk.**

- **Select Proven Makes and Models.**

🚀 Next Steps

- **Create a scoring matrix based on engine type, historical crash safety, and weather performance to evaluate aircraft options.**
- **Schedule consultative sessions with top-performing aircraft makers to understand model safety records and innovation in crash prevention.**
- **Use historical data to simulate crash scenarios across aircraft types and flight phases to estimate operational risk exposure.**

ANY QUESTIONS ?

Thank You