

AVIATION INDUSTRY OVERVIEW

EXPANSION INTO THE AVIATION INDUSTRY



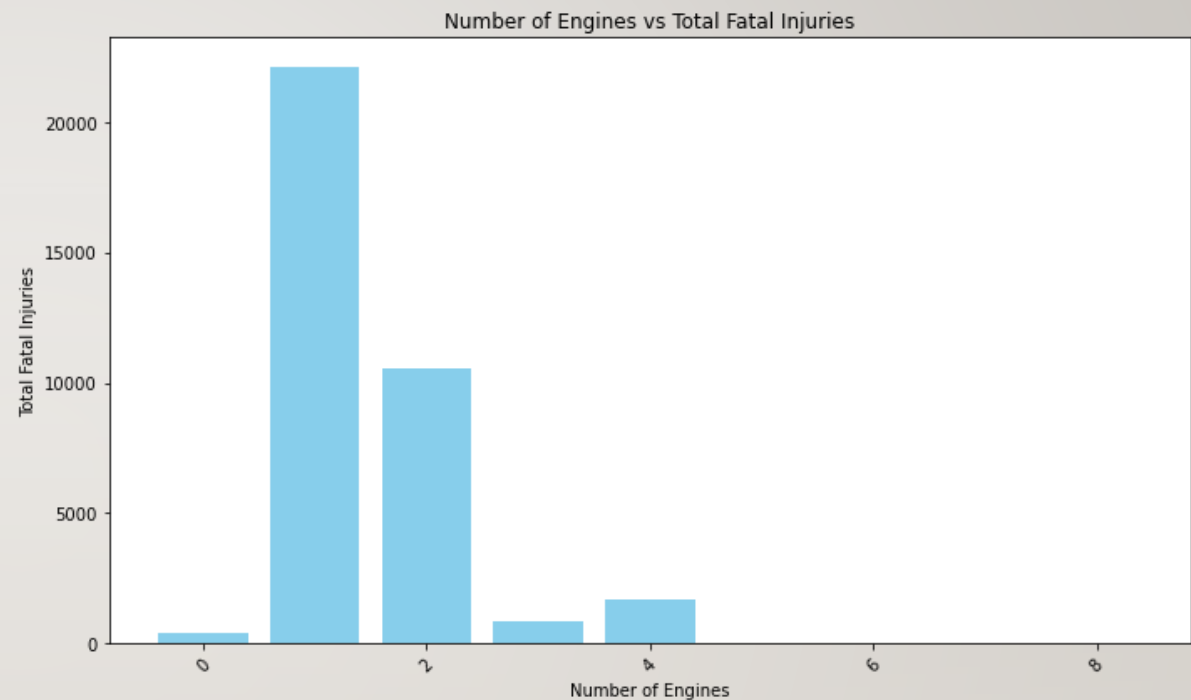
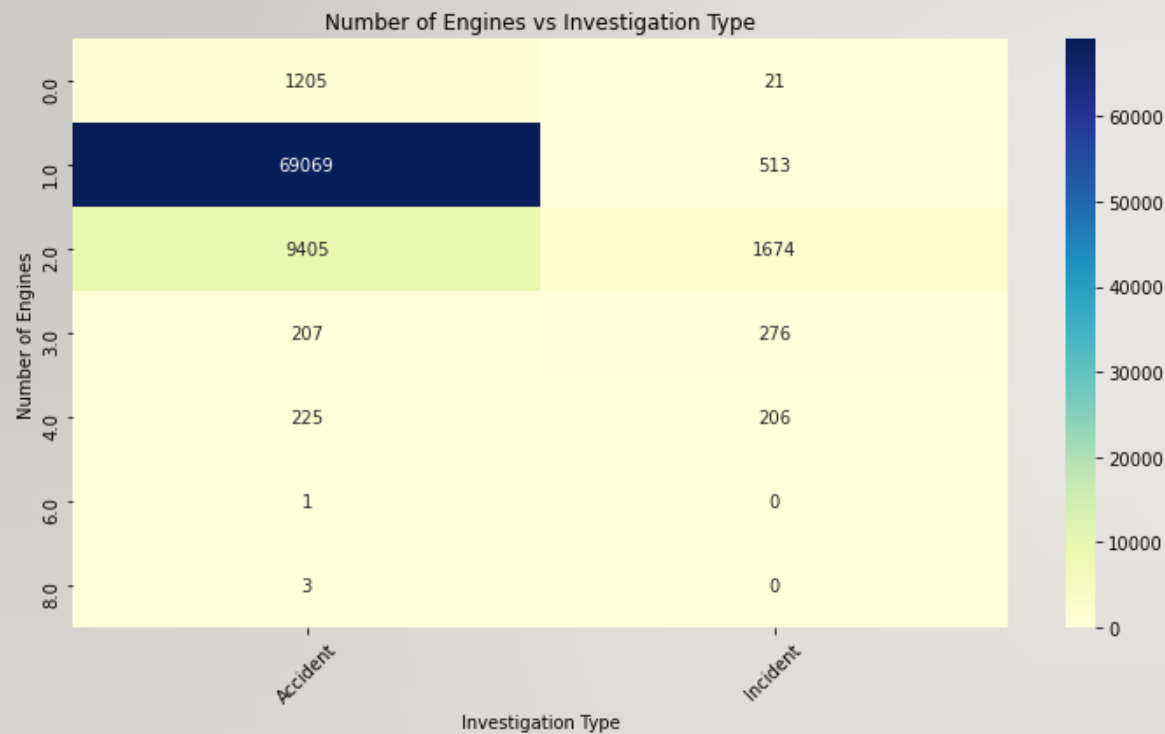
BUSINESS STATEMENT

- As the company considers expanding into the commercial and private aviation sectors, it is essential to evaluate the risks linked to various aircraft types.
- This analysis reviews historical aviation data to identify trends in accidents and fatalities, providing insights to support risk-aware aircraft acquisition decisions.
- The following questions guided the objectivity of the analysis, aligned with the main risk areas identified: a) Engines - What are the historical accident and fatality rates for aircraft with a set number of engines ? b) Risk of aircraft damage - How frequently do different aircraft types experience damage incidents and what is the extent or severity of the damage? c) Make and Model – How different manufacturer aircrafts recorded fatality rates

DATA REVIEW

- **Data Source:** The dataset was sourced from the National Transportation Safety Board and contains historical aviation safety records of incidents and accidents involving various aircraft types, starting from 1962.
- **Data Preparations:** The dataset was cleaned to remove inconsistencies and incomplete entries, enhancing the quality and reliability of the analysis.
- **Relevance to Analysis:** This dataset offers valuable insights into accident trends, fatality rates, and aircraft damage, enabling an assessment of the risk profiles of different aircraft types to support informed decision-making.

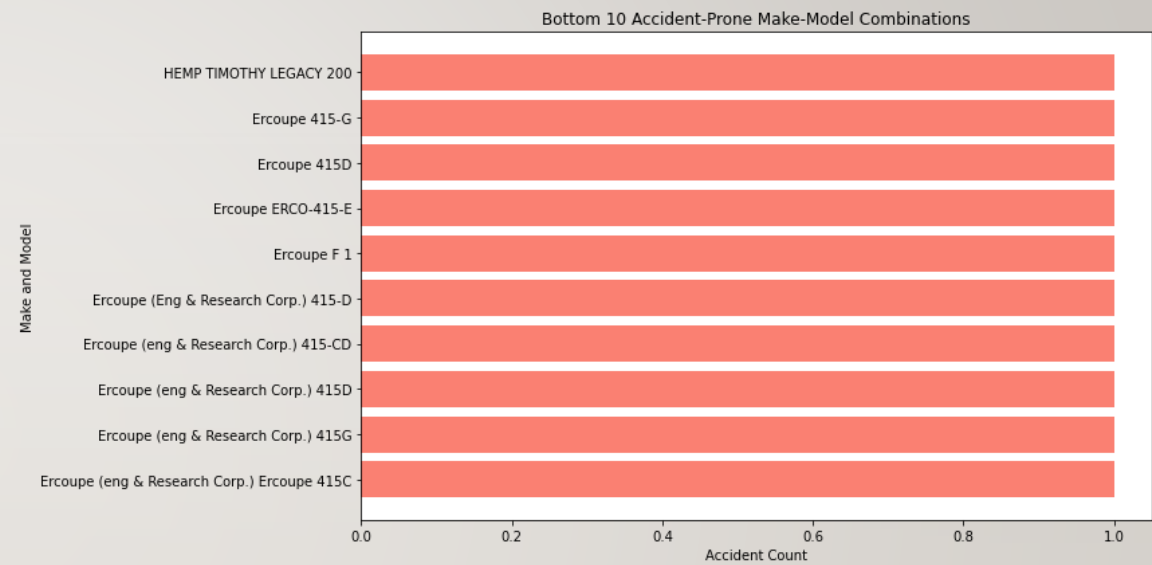
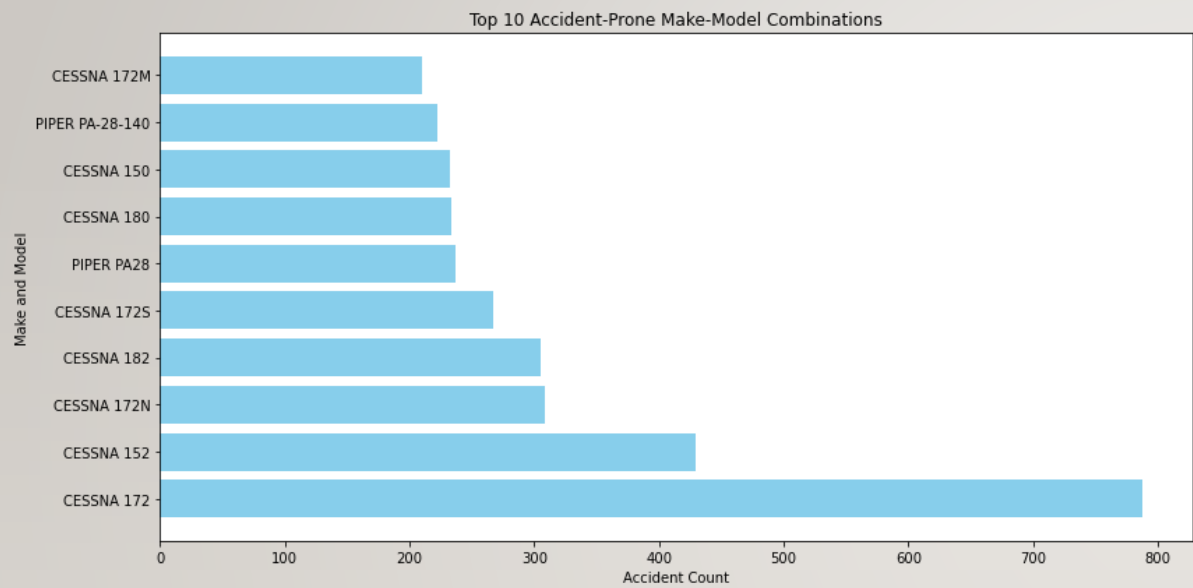
I. ENGINES: To assess the relation between number of engines and accident type and fatality counts , data was grouped and carefully filtered to come up with inferences that the more the number of engines the safer the aircraft. The charts below highlight these findings



2.Aircraft Category: To evaluate the risk associated with specific type of aircraft, the type of aircraft was analysed against type of aircraft damage.Aircraft damage was also assessed against total fatal injuries



3.Make & Model Combination: An analysis of make and model combinations was conducted to determine accident counts for each pairing.This helped identify which combinations were most and least prone to accidents. Combinations associated with a higher frequency of fatal accidents were highlighted, providing further insight into aircraft types that pose greater safety risks.



Result & Findings

- Aircraft with one or two engines accounted for the highest number of accidents, while aircraft equipped with eight engines showed significantly no accident, suggesting that a higher number of engines may contribute to greater safety.
- Majority of aircraft makes and models experienced either substantial or complete damage during incidents, indicating a higher level of risk associated with acquiring them. Only a few aircraft types recorded minor or no damage, suggesting a lower risk profile.
- Cessna 172 aircraft recorded the highest number of accidents, the Cirrus Design Corp SR22 had fewer total accidents .
- Aircrafts with minimal accidents such as the Rans S6S, Hawk Arrow II, Kitfox Super Sport suggests that factors like design, usage, or operational procedures may contribute to their safety.



Recommendations

Prioritize Aircraft with higher engines counts and Electric Engine for improved Safety and Reliability:

- Focusing on aircraft with more engines has shown to significantly reduce the risk of accidents, indicating a clear correlation between the number of engines and improved safety. To further enhance safety and minimize operational risks, it is recommended that the company prioritize acquiring aircraft with higher engine counts.
- Transitioning to electric engine for new fleet acquisitions improves safety while reducing long-term operational costs. This shift would not only boost reliability but also position the company as a forward-thinking player in the evolving aviation industry.



Recommendations

Make & Model Combinations

- Purchasing aircraft based on historical safety performance, accident records, and maintenance requirements is essential to reduce operational risks and ensure long-term reliability.
- It is advised that the company avoid acquiring aircraft like the Quicksilver, which has been associated with a higher number of incidents, or any aircraft linked to fatal accidents. Instead, the company should prioritize aircraft models with fewer or no accidents. Aircrafts such as the Cessna T210L and Beech B23, exhibit greater durability therefore should be considered safer options.

Strategic Recommendations for Improving Aircraft Safety and Minimizing Risk:

- The company should develop operational strategies that prioritize Instrument Meteorological Conditions (IMC), as these conditions have been associated with fewer accidents compared to Visual Meteorological Conditions (VMC). When planning flight purposes, it is advisable to focus on specialized aircraft missions, such as firefighting, air drops, and glider towing, which have shown lower incident rates. In contrast, aircraft used for personal and instructional activities have exhibited a significantly higher number of incidents, highlighting the greater exposure to risk associated with these types of flights.

