



CHOOSING SAFELY:
ANALYZING AIRCRAFT
RISKS FOR STRATEGIC
INVESTMENT.

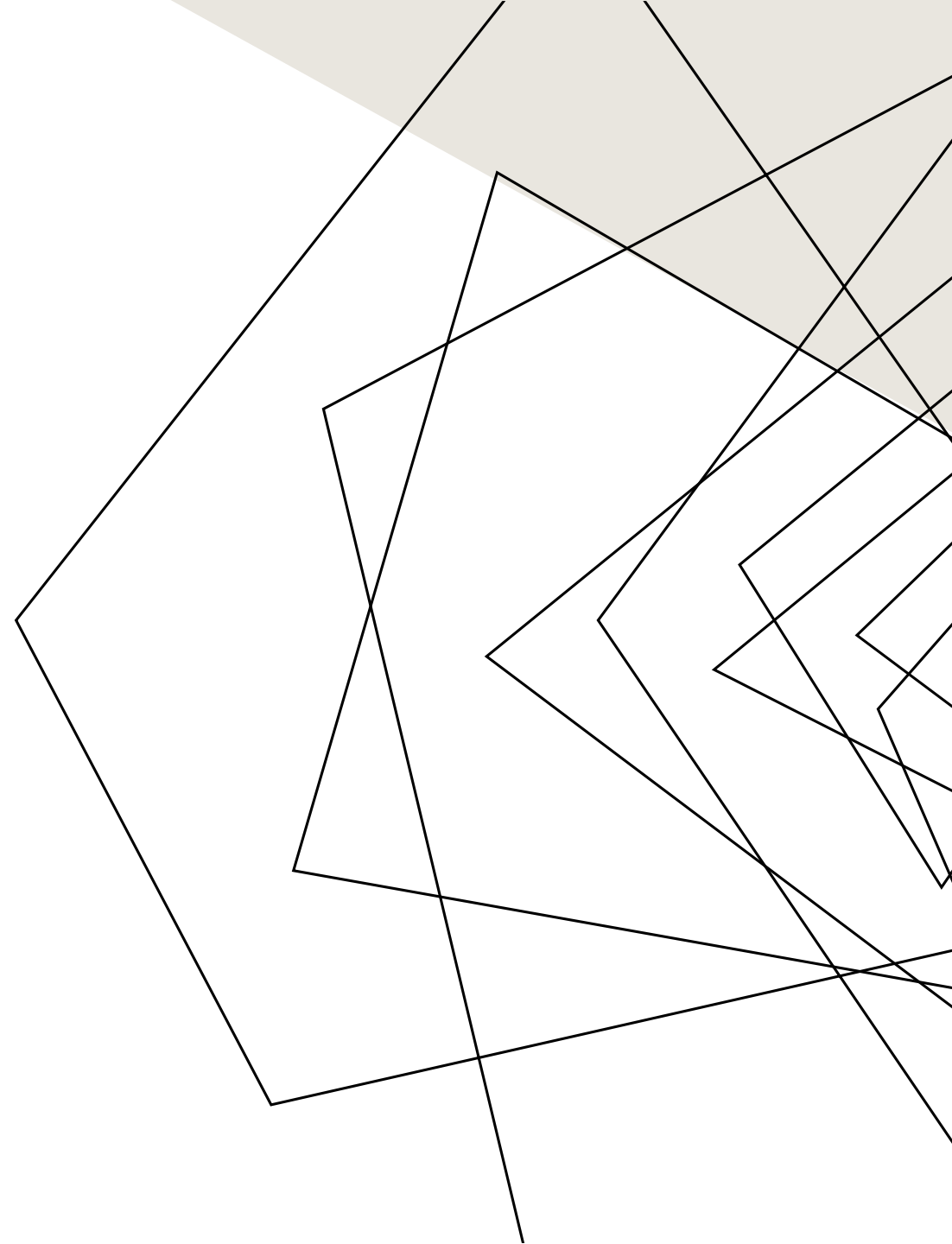
INTRODUCTION.

As we enter our company's expansion into the aviation industry, we are venturing into a field that brings enormous opportunities but also huge risks. Air travel-either commercially or privately-is a high-stakes industry in which safety is of paramount importance.

Our leadership has asked us to identify the safest and most reliable aircraft models that could fit their goal of establishing a safe and viable aviation division. However, entering a new industry-with limited prior experience-raises some very specific challenges in terms of understanding factors of aircraft safety and operational risk.

Through this analysis, I will dig into historical aviation accident data to answer a very critical question: Which aircraft present the lowest risk for the company to confidently invest in and operate?

These findings will provide actionable insights to create informed decisions, ensuring our new aviation division takes off on the right foot with its foundation: knowledge, safety, and operational efficiency.



BUSINESS
UNDERSTANDING.



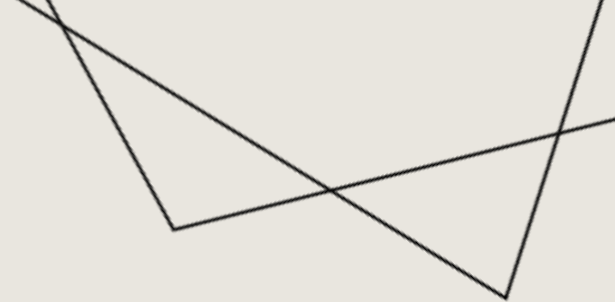


In this section, I want to answer the most important questions that have to be done in order to decide which is the safest aircraft to buy:

- What are the most important factors causing accidents in aviation?
- Is it weather-related? Pilot error? Aircraft type or condition?
- What aircraft models and makes have the lowest number of accidents and fatalities?
- Using these data, is it possible to find some models that are, in a statistical point of view, safer than others?
- What external conditions - weather and flight phases, to name a few affect the risk of accidents?
- Which are those aircraft types that present the best compromise between safety and efficiency from the operational viewpoint?



**DATASET
INFORMATION.**

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- **Aircraft Make and Model:** Aircraft that were involved in the accident.
 - **Weather Conditions:** Accident occurred during either IMC or VMC.
 - **Fatality Rates:** The overall number of fatalities in the accidents.
 - **Flight Phases:** Phases during which the accident happened, such as takeoff, cruise, and landing.

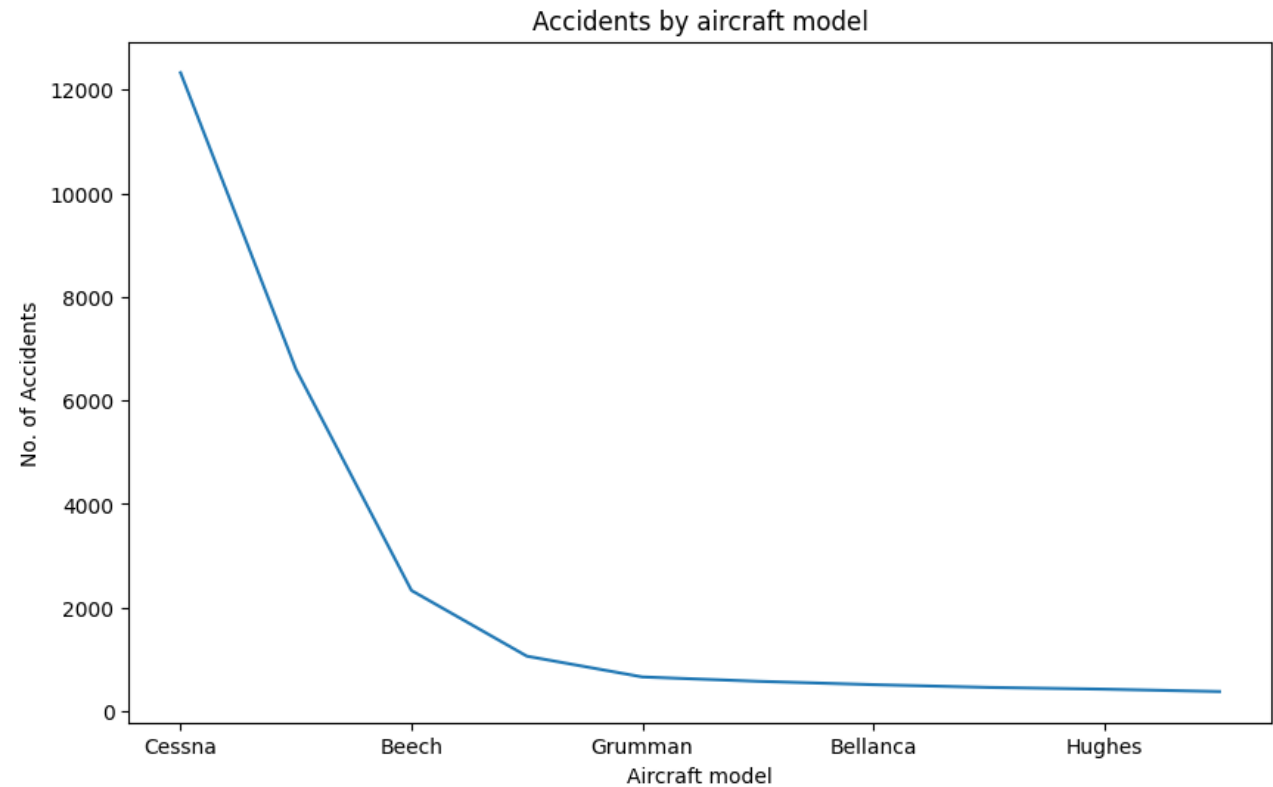
The resultant dataset forms the basis of our analysis, which aids in the identification of various trends and makes recommendations based on the facts.

DATA ANALYSIS.

GRAPH 1: ACCIDENT RATE BY AIRCRAFT MODEL.

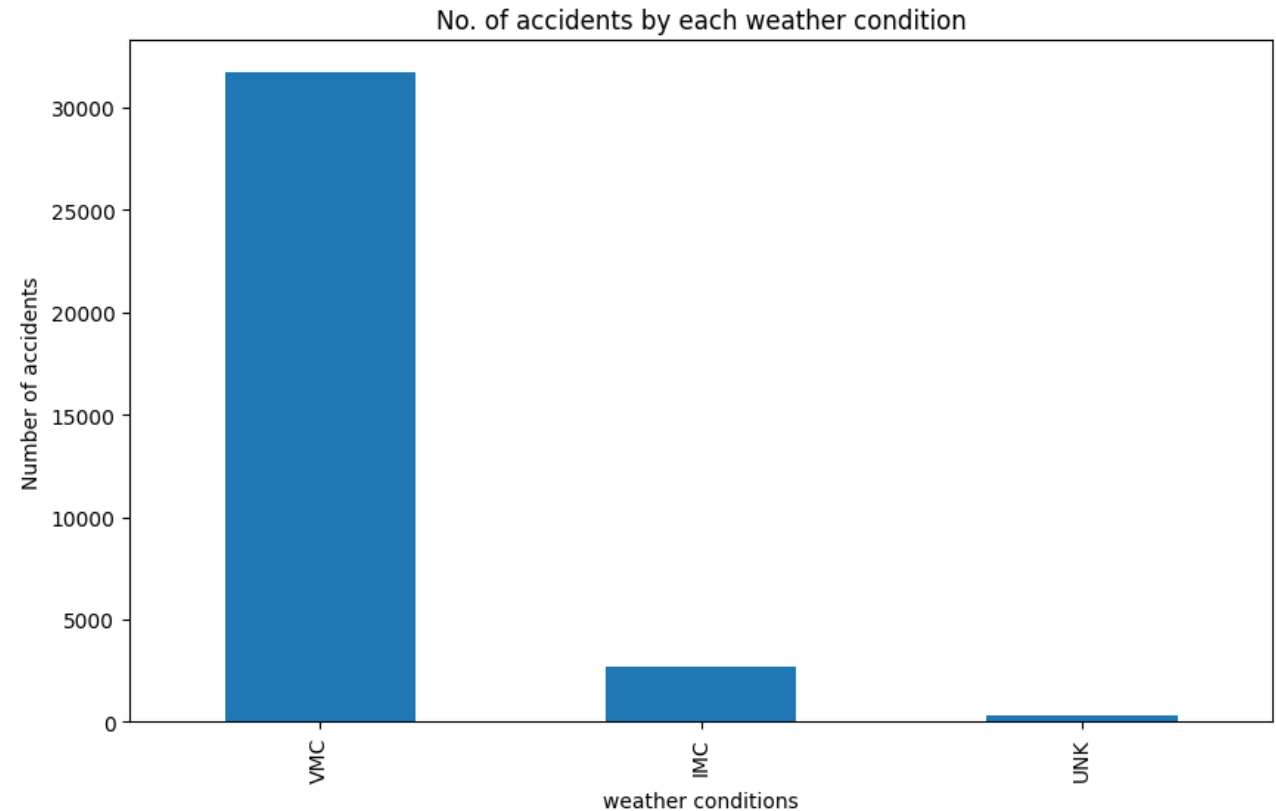
- This graph compares the accident rates of various aircraft models, highlighting which models have higher or lower rates of accidents and fatalities.

Key Insight: The Cessna aircraft make has the highest rate of accidents, therefore making it not a good choice for recommendation.



GRAPH 2: IMPACT OF WEATHER CONDITIONS ON ACCIDENTS

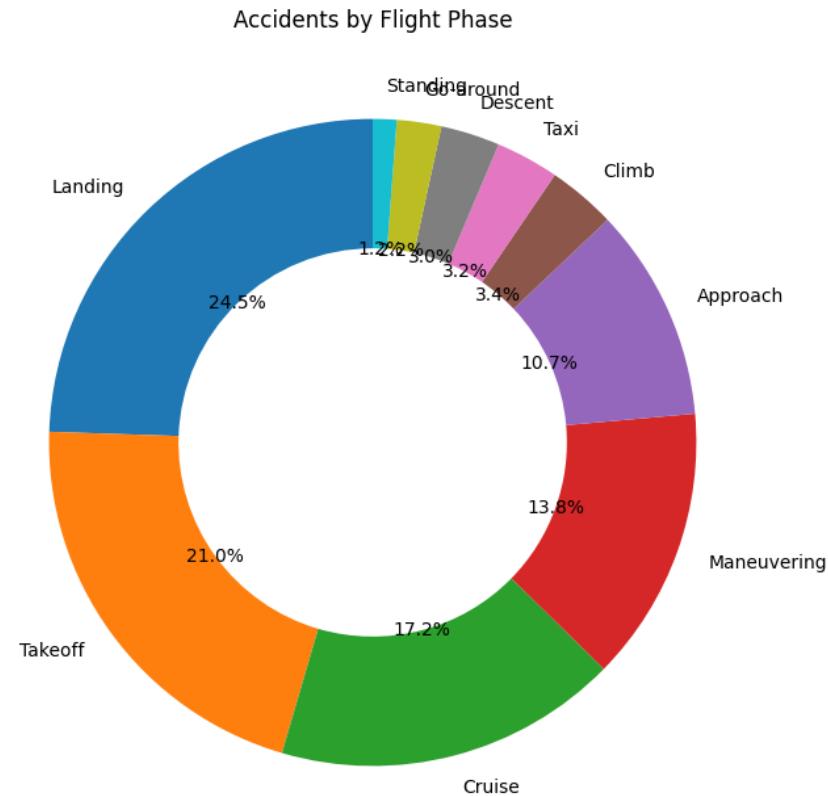
- This graph shows the distribution of accidents based on weather conditions (IMC vs. VMC).
 - **Key Insight:** A significant number of accidents occur under IMC, suggesting that aircraft with advanced avionics and weather navigation systems are essential for operating in unpredictable weather.



GRAPH 3: FATALITIES BY FLIGHT PHASE

This graph outlines the phases of flight (takeoff, cruise, approach, landing) where accidents are most frequent.

- **Key Insight:** Most accidents occur during landing, that is 24% and takeoff phases(21.0%), indicating the importance of selecting aircraft with reliable performance during these critical moments.



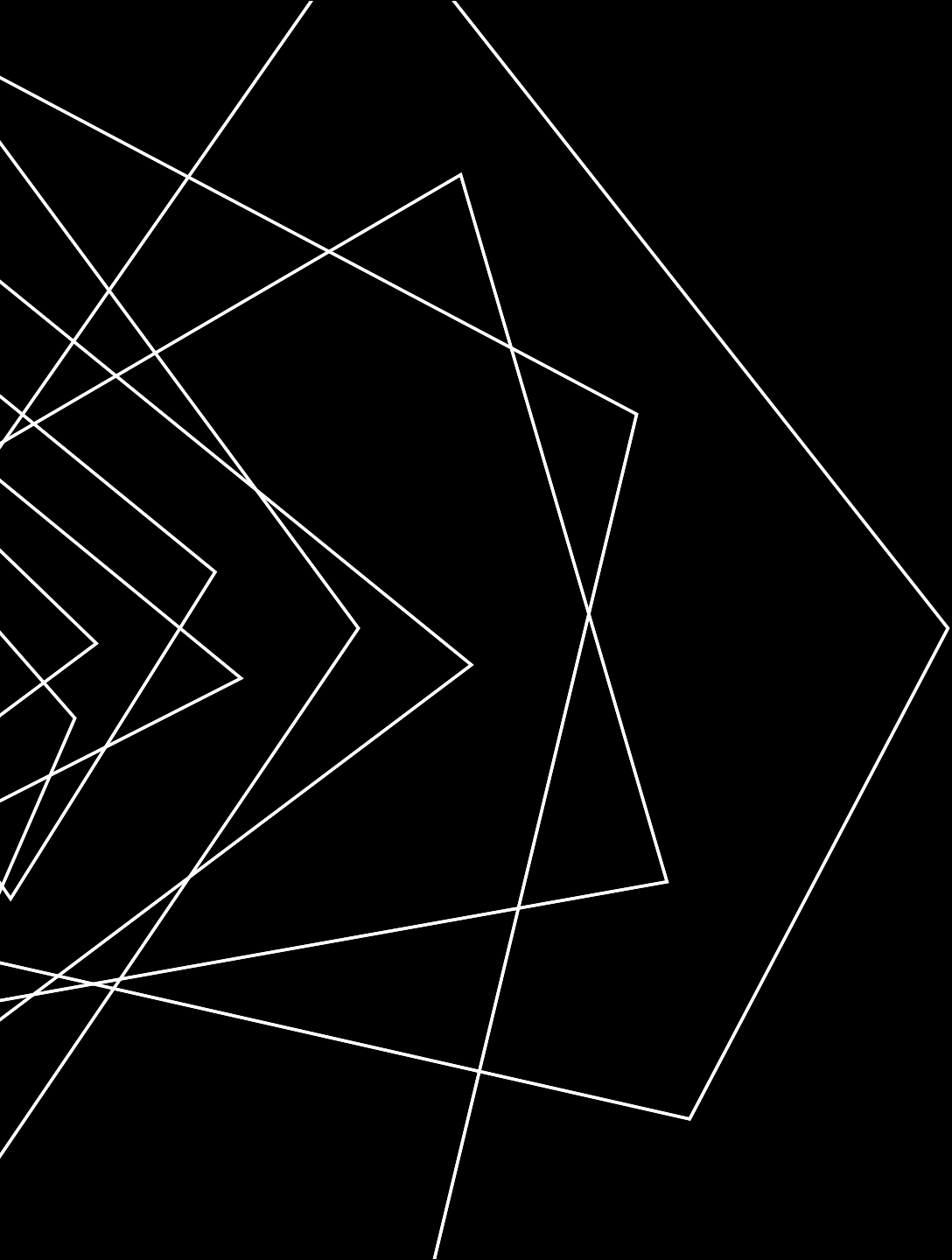
KEY FINDINGS

- **Aircraft Model Safety:** The Boeing aircraft experienced a significantly higher likelihood of survival, has consistently demonstrated lower accident and fatality rates compared to other aircraft models, making it a top contender for purchase.
- **Weather's Role:** A substantial number of accidents occur under **IMC**, highlighting the need for aircraft equipped with advanced weather navigation systems to mitigate risk.
- **Engine Reliability:** Aircraft with **reciprocating engines** tend to show better reliability and fewer accidents. The **Beechcraft Bonanza** is an example of a model that benefits from this engine type.

RECOMMENDATIONS

Based on the analysis, the following recommendations are made to guide aircraft purchasing decisions:

- **Purchase the Boeing aircraft:** This model has one of the lowest accident rates, making it an ideal choice for private and commercial operations.
- **Invest in Aircraft with Advanced Avionics:** Aircraft with advanced weather navigation systems, such as **Garmin G1000**, are crucial for operating in regions with unpredictable weather.
- **Ensure Strong Performance in Critical Flight Phases:** Focus on aircraft that perform reliably during **takeoff, approach, and landing**, as these are the phases most vulnerable to accidents.



THANK YOU

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