AIRCRAFT ANALYSIS

Introduction

By evaluating the safety performance of different aircraft models and utilising historical data from the National Transportation Safety Board (NTSB) aviation accident database, this aviation safety study seeks to inform a company's aircraft purchase decisions. The investigation will explore critical factors influencing aircraft safety, with an emphasis on risk minimisation and operational safety enhancement for both commercial and private aviation.

Business Understanding

- Operational and Environmental Factors: In variable weather conditions and throughout crucial flight stages (such as takeoff and landing), aircraft must operate safely. To ensure constant safety, we want models that can adapt to a variety of operational demands and conditions.

- Specific Suggestions: Aircraft selection is contingent upon the nature of the intended use, be it educational, business, or personal travel. Our research will assist in determining which models are most appropriate for our particular operating requirements, enabling us to select aircraft that operate effectively in both private and commercial settings.

- Safety First: We are in line with the company's emphasis on safety and risk management by selecting the safest aircraft models, which lowers the possibility of such events.

Data Understanding

The data used is from the National Transportation Safety Board was understood in order to explore and familiarize ourselves with the dataset, ensuring it meets the requirements for analysis.

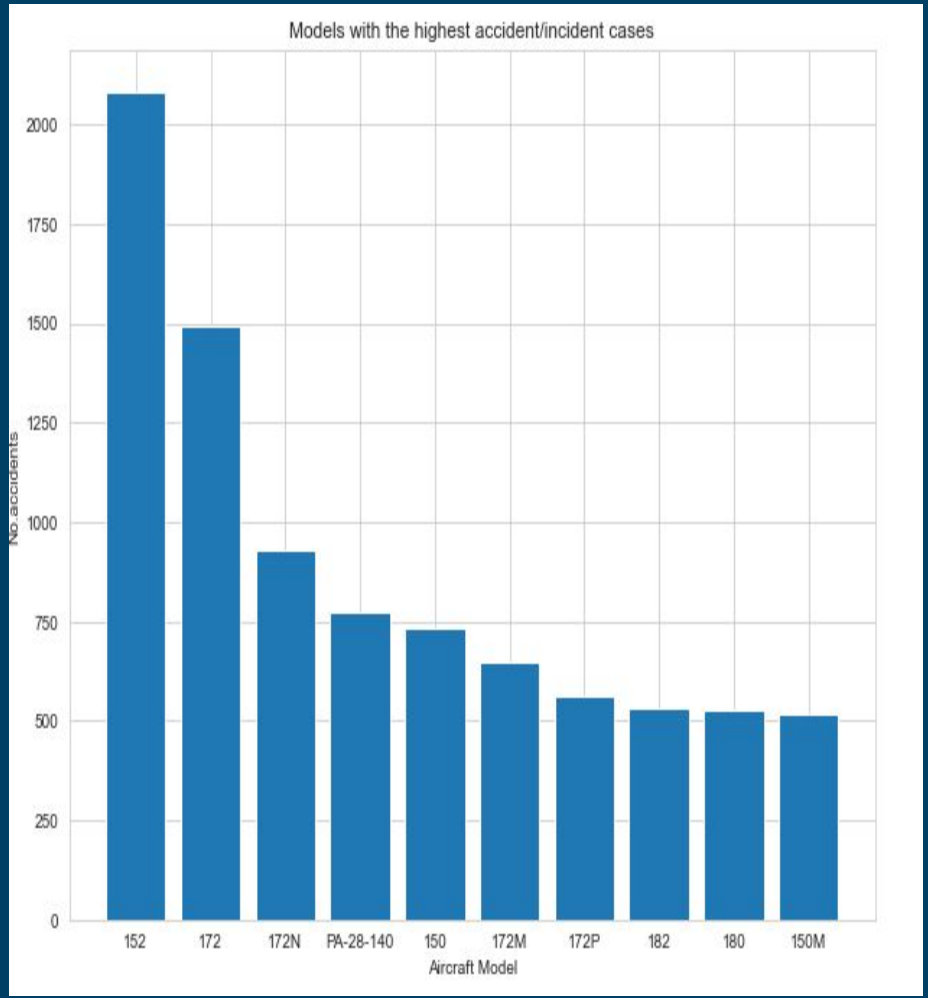
The dataset has 90348 records and 31 columns and covers a time period from 1942-2022.

Data Cleaning

In order to guarantee the accuracy and calibre of the dataset, data cleaning is an essential stage in the data analysis process. It entails locating and fixing mistakes or discrepancies in the data, which is necessary to generate accurate and dependable findings.

Data Analysis

According to the data, the Cessna 152 has been involved in the most incidents, with 2,083 investigations, followed by the Cessna 172 with 1,494 cases, and the Cessna 172N with 930. Piper models, such as the PA-28-140 (775 cases) and the PA-28-150 (731 cases), are also frequently mentioned. This suggests that these aircraft, especially popular training planes like the Cessna 152 and 172, are often linked to incidents, likely because they are widely used in flight schools and private flying.



Data Analysis

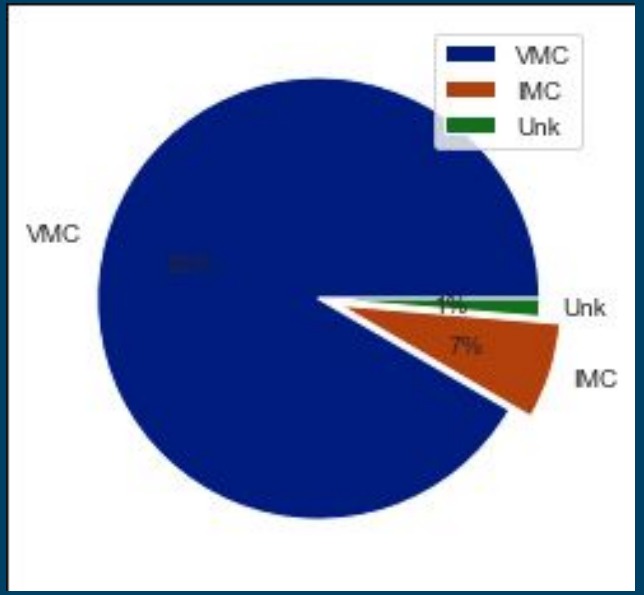
It's important to consider how different aircraft models perform in various weather conditions, as weather plays a big role in flight safety. In this analysis, we will focus on the impact of weather. We have three categories of weather conditions:

- **VMC (Visible Meteorological Conditions)**

- **IMC (Instrument Meteorological Conditions)**

- **Unknown**

By comparing how different aircraft handle these weather conditions, we can see which models perform better in certain situations. This will help us make informed decisions about which aircraft are safest and most suitable for different flying environments.

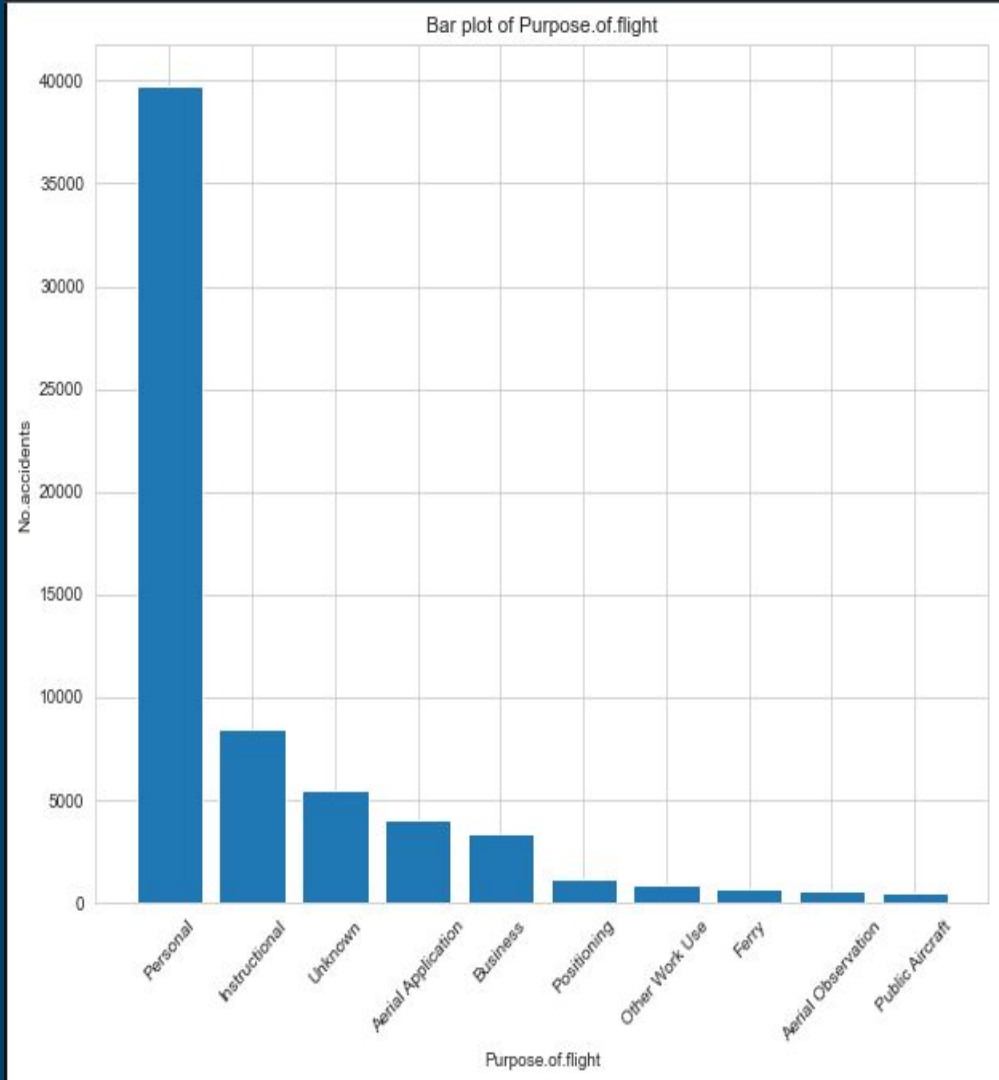


Data Analysis

The data shows that personal flights have the most accidents, with 39,762 incidents. This could be because private pilots have different levels of experience and may not follow strict maintenance rules.

Instructional flights, where students are learning to fly, also have a high number of incidents, with 8,486 reported. This is likely because students are still developing their skills.

Other types of flights, like crop-dusting (3,987 incidents) and business flights (3,337 incidents), also have some risk. These incidents may be due to the unique challenges of each type of flight, such as farming tasks or frequent travel for business.



Recommendations

In summary, a complete approach is necessary to ensure aviation safety, particularly for personal and instructional flights. Important tactics consist of:

Examining Aircraft Models: Pay close attention to frequently used models to make sure they are modernised with safety features and properly maintained.

Comprehensive Pilot Training: Implement thorough training programs, particularly in instrument flight, for models like the PA-28-181, 172N, and A36. This will enhance pilots' situational awareness and reduce reliance on visual cues.

Choosing Safe Aircraft: To mitigate the hazards associated with varied pilot experience levels and changing environmental conditions, select aircraft with a solid safety record and impose rigorous maintenance schedules.

Next Steps

Getting knowledge on lifespan, fuel efficiency, maintenance costs, and other parameters will be helpful in deciding which aircraft to buy for our fleet.

Thanks!

QUESTIONS
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