AIRCRAFT RISK ASSESSMENT FOR COMMERCIAL AND PRIVATE OPERATIONS

Business Understanding

- Our company is expanding in Aviation industry and are interested in purchasing and operating airplanes for commercial and private enterprises,however they lack knowledge about the potential risks involved in an aircraft.

- They want to purchase an aircraft model which will not cause financial losses and also has low risk of accidents.

- We will check on the history of the aviation data in different aircraft model and evaluate the accident count,severity of injuries and whether the aircrafts are for Private or Commercial purpose and generate Dataa driven insights to guide the company in decision making.

Overview

▶ This project aims to analyze the history of the Aviation data and decide which aircraft model has the lower risk for commercial and private enterprises.

▶ The analysis will help the company in determining which aircraft is safest to purchase and operate to minimize the potential risk of accidents.

▶ The audience of this analysis is the Head of the new aviation division who will help decide which aircraft to purchase,this will be possible after translating my findings and giving actionable insights.

▶ The Dataset 'AviationData.csv will help in analysing by identifying the patterns,the trends and accidents rates based on the aircraft model,type of injuries, weather conditions and other factors that contribute to the risk of each aircraft.

Goals

▶ The project goal is to determine which aircraft models present the lowest operational risk for the company to expand to aviation industry business.

▶ The relevant variables that will help us access risks include:

✓ Evaluating the accident history

✓ Severity of injuries

✓ Phase of flights

✓ causes of incidents/accidents like weather conditions

Data Understanding

- For analysis,I used descriptive analysis by analysing the injury severity whether it is fatal,serious,minor,incident and non-fatal.

- Calculation of the total number of accidents based on the aircraft make and model.

- Checking the broad phase of flight where accidents appeared the most.

- Checking whether the weather conditions influenced the number of accidents.

Data Analysis

▶ Calculating the Total number of accidents and Injury severity based on the aircraft make and model .

Top 10 Aircraft models by Number of Accidents

Top 10 make with highest injury severity by Aircraft make
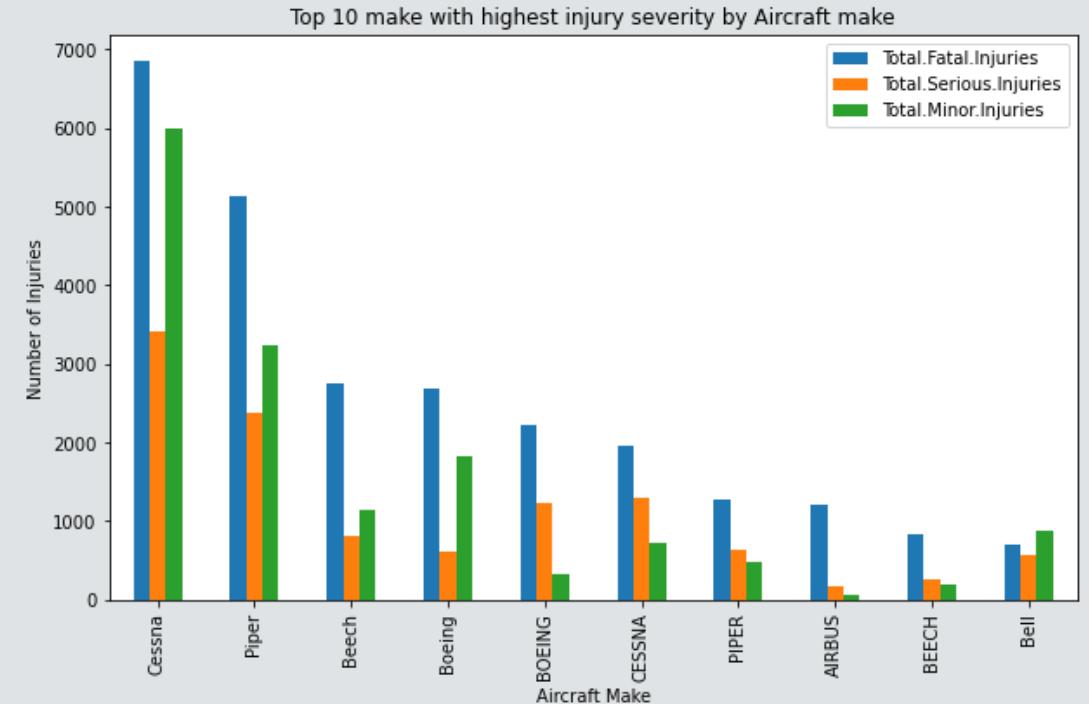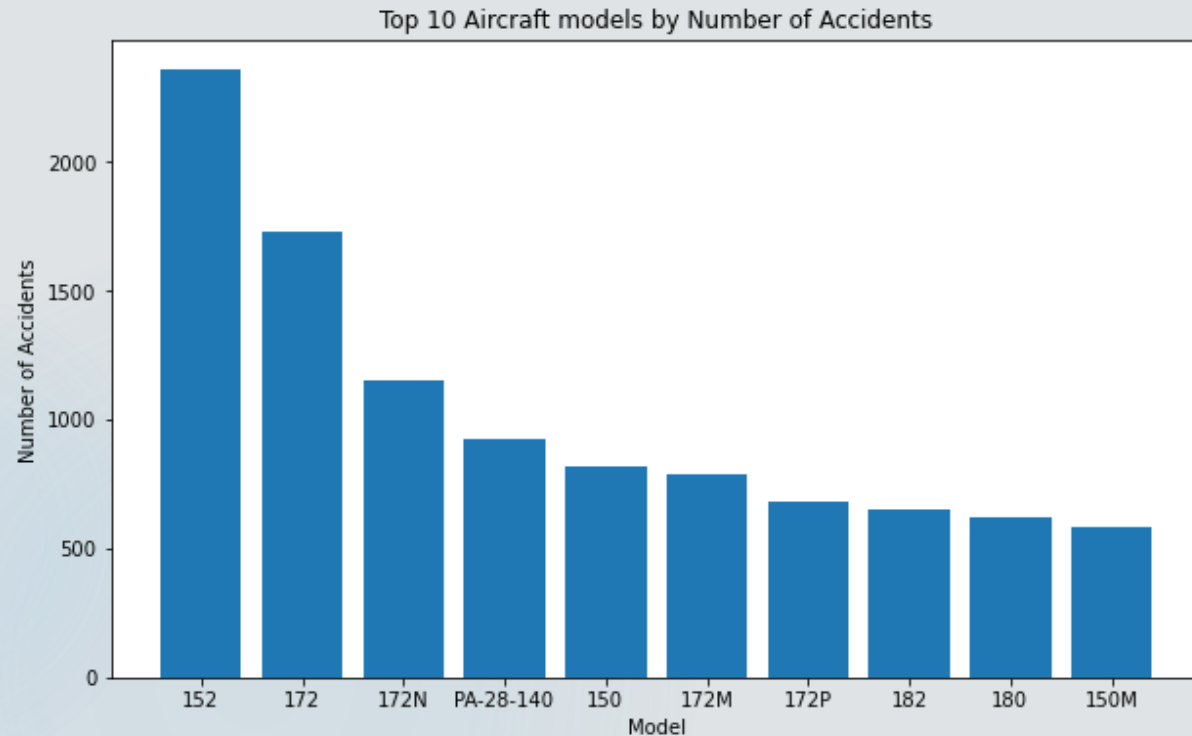
▪ From the above bar chart,the aircraft model with the highest accident rates and has the highest injury severity is Cessna 152 and so we should avoid it and pick the one with the lowest risk rate.

# Top 5 Aircraft model with the lowest risk of accident

▶ Below is a Bar graph with Top 5 Aircraft models with lowest risk of accidents.

Top 10 Aircraft models by Number of Accidents
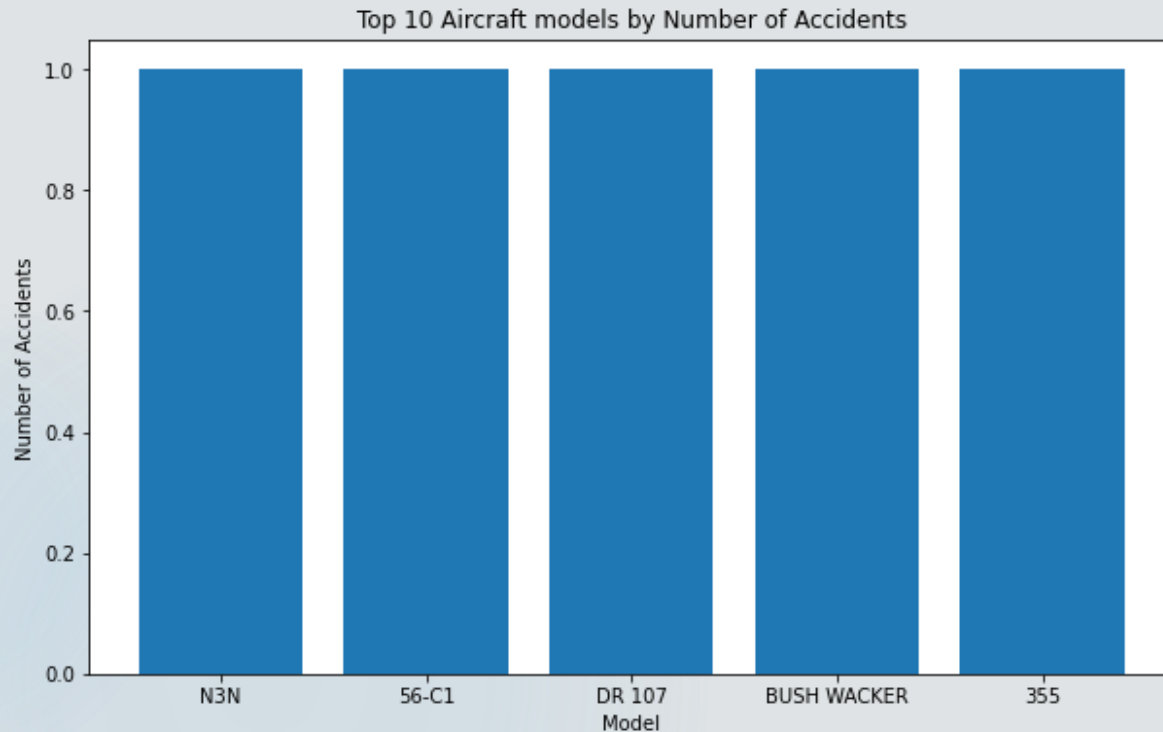
▶ From the above graph,we can see that the aircraft with the lowest risk of accidents is Naval Aircraft Factory N3N which is used for Personal purposes and so it is for Private Use.

▶ The aircraft Model with low accident rates ,low fatality and highest number of uninjured is the best for commercial use and the airplane model is vickers VC10 and it has caused no injuries and have few numbers of non-injured.

Number of accident based on the Phase of flight

► The analysis shows that the accidents can be caused by the phase of flight like Landing,Takeoff,Cruise,maneuvering.

Flight phase by Number of Accidents
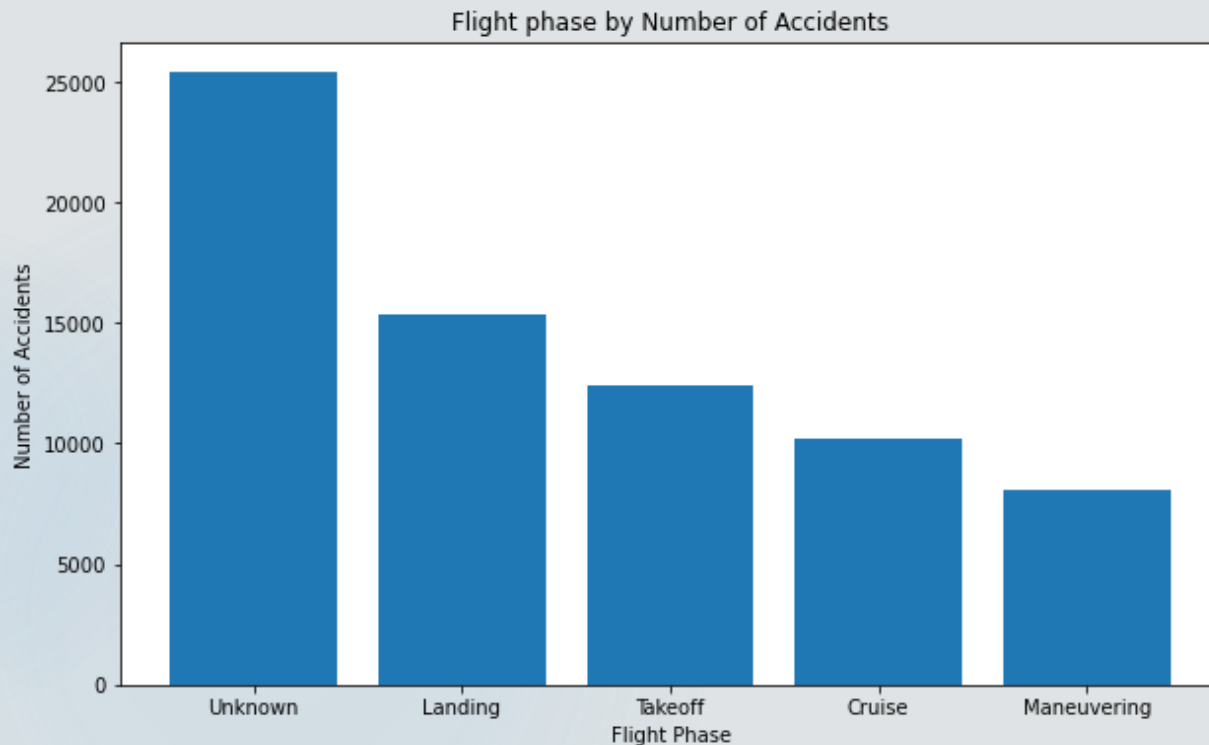
► The graph shows that apart from the data that is unknown,most accidents were caused when the airplane model was Landing.

Number of accidents based on the Weather conditions

▶ There are different types of weather conditions:

✓ VMC-Conditions suitable for visual flying.

✓ IMC-Conditions that require instrument flying.

✓ UNK- Weather condition unknown or unrecorded

Accidents by Weather conditions
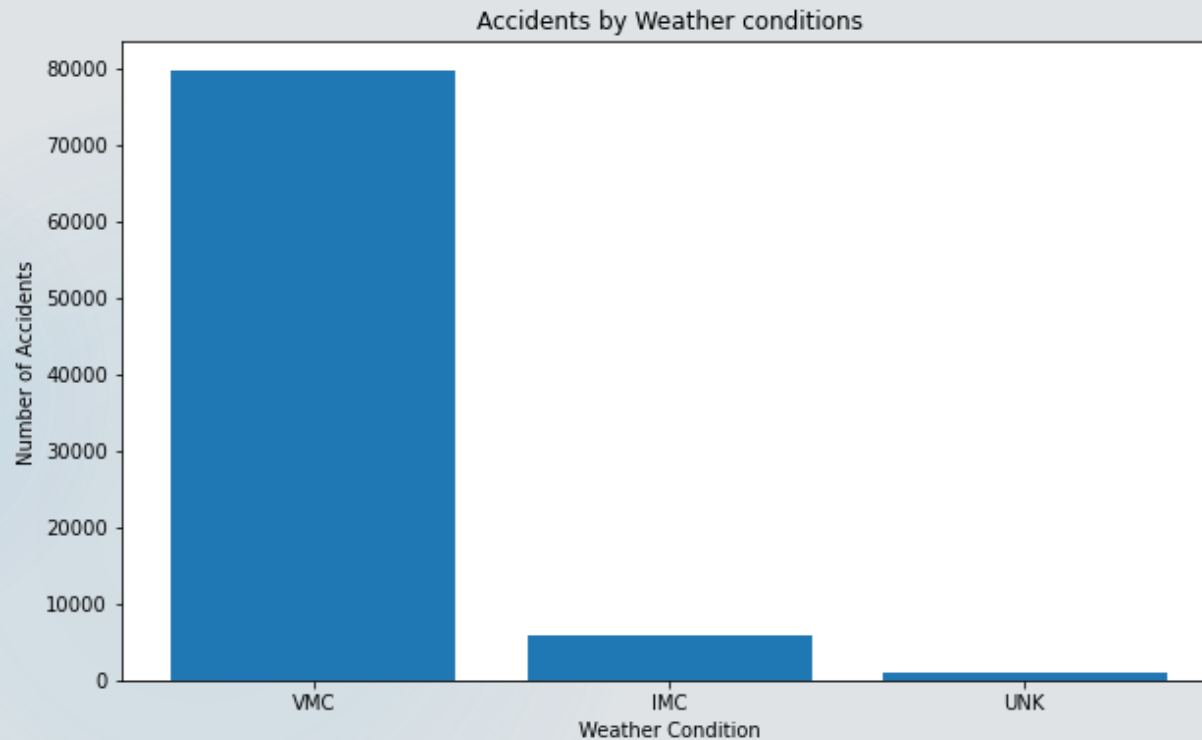
From the above data,most accidents happened during the VMC conditions which was a conditional suitable for flying so the weather did not influence the performance of the aircraft.

Findings

▶ From the above analysis,we tend to see most private flights have slightly higher accident rates than the commercial flights but also have low injury severity rate.

▶ Commercial flights experience few fatal injuries but depending on the model.

▶ Based on the analysis,the aircraft model which posses low injury severity and accident rates are advised.

▶ From my analysis,the weather condition did not affect much the performance of the aircraft .

▶ I can advise aircraft model like Naval Aircraft Factory N3N for private purposes as it has low injury severity and accidents

▶ For commercial purpose,I can advise Public Aircraft vickers VC10 as it has low accident and fatality rate with a number of uninjured.

Metrics of success

- My project would be successful if I would be able to identify:

✓ Aircrafts models with high percentage of minor injuries or no injuries and low percentage of fatal injuries are preffered.

✓ Aircraft models with lower accident rates are preferred and also identify aircrafts with high accident rates and serious fatal injuries so as to avoid them.

✓ Aircraft models with low cost effectiveness but has low accidents and injury rates for investment.

Recommendations

▶ Based on the analysis and the metric of success,below are my recommendations:

1) Identify aircraft models with high risk of accident with fatal and serious injuries as they would posses a high risk and avoid them.

2) Prioritize aircraft model with low risk of Fatal and Injury rates

3) Regular update risk assessment and re-evaluate aircraft models as new data is updated.

4) New models tends to have lower risk than the old ones so invest in modern aircraft models.

Next Steps

▶ Start evaluating aircraft models identified in the analysis for both private and commercial use so as to purchase.

THANKYOU

▶ Is there any question or needed clarification on the analysis or recommendations presented?

▶ Name: Vivian Nyawira Njagi

▶ Contacts: 0746649202

▶ Email address: viviannjagi16@gmail.com

▶ Linked in Profile: Vivian njagi