Analysis of Aviation Accident Data

Joy Gitau • 26.09.2024

Introduction

As our company expands into the aviation industry, it is essential to assess the risks associated with purchasing and operating various aircraft.

This project aims to analyze aviation accidents data and identify trends, risk factors, and ultimately recommend the aircraft types that present the lowest risk for our new business venture in commercial and private aviation.

Data

We are working with a version of the Aviation Accident & Synopses, which can be found on Kaggle and was originally from the National Transportation Safety Board that includes aviation accident data from 1962 to 2023 about civil aviation accidents and selected incidents in the United States and international waters.

Objectives

The primary goal of this project is to analyze aviation accident data to identify low-risk aircraft for purchase and operation to inform our company decision.

To achieve this, we will focus on the following key question:

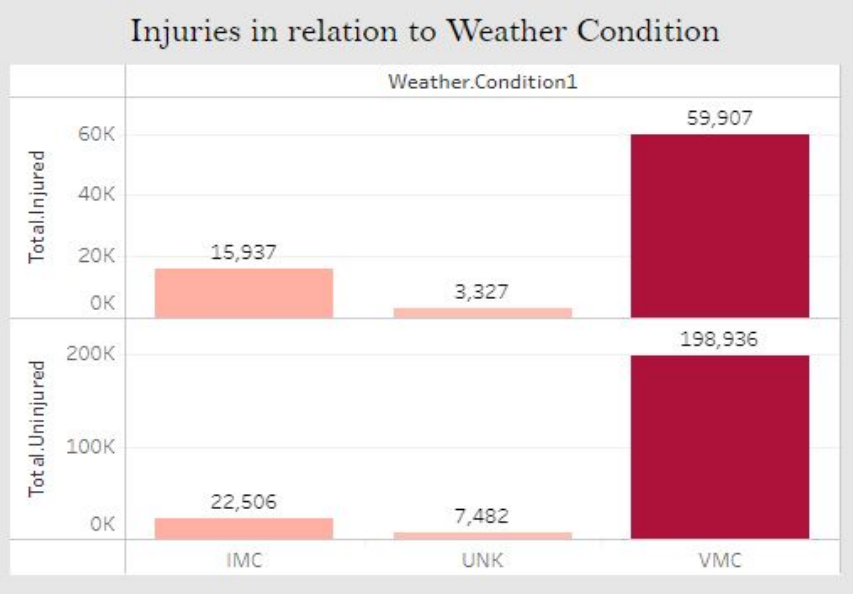
1. What are the potential Risks of operating aircrafts?
2. What aircraft have the highest and lowest risk?

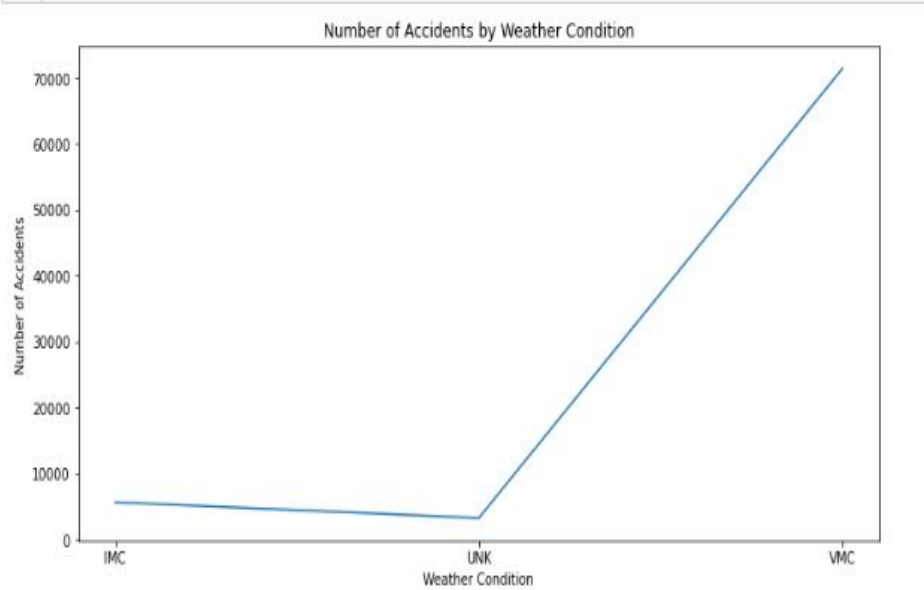
Process Steps

These are the steps followed to generate insights

The potential Risks of operating aircrafts

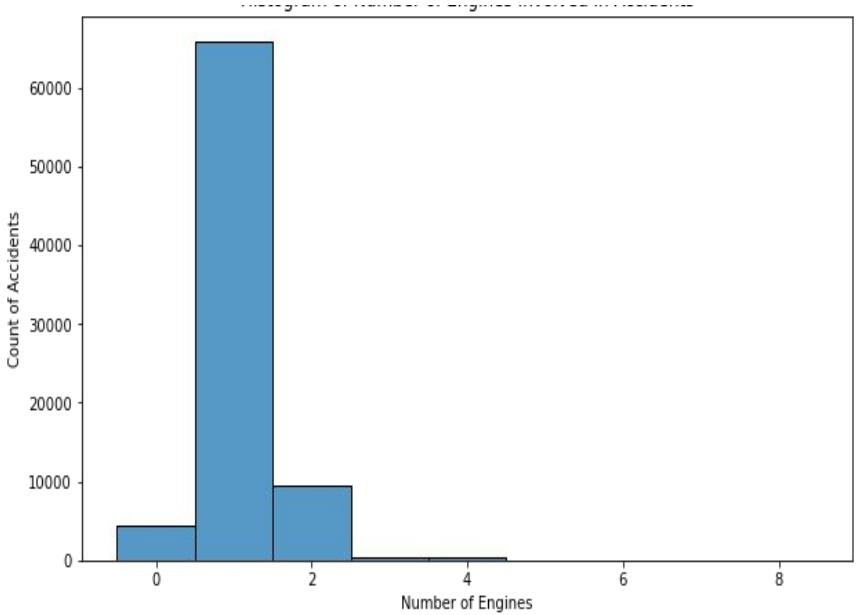
Weather Condition

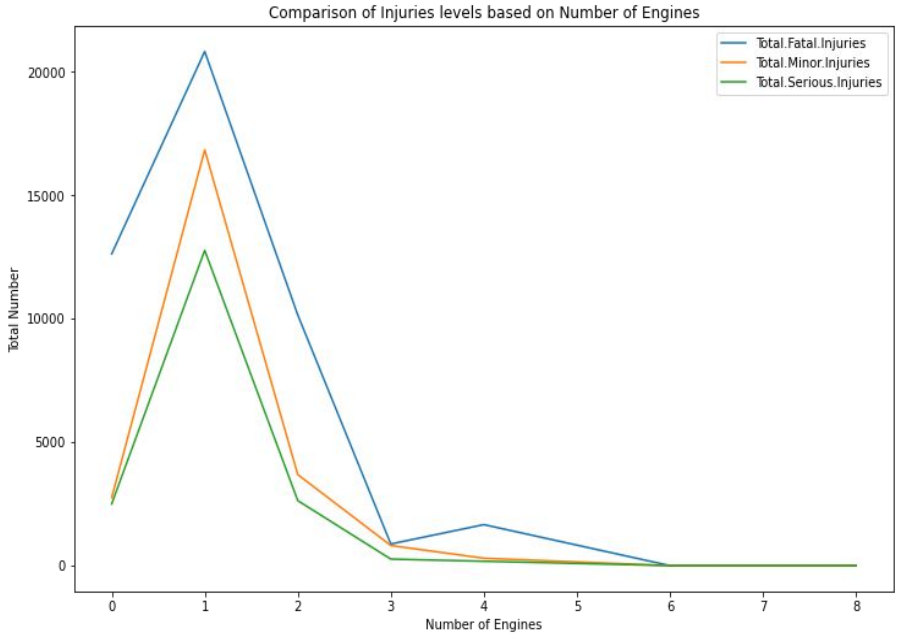




We see that VMC weather condition has a result of more accidents. VMC allows pilots to use visual reference as compared to IMC where aircraft instruments are used for navigation of weather conditions

Number of Engines in Aircraft

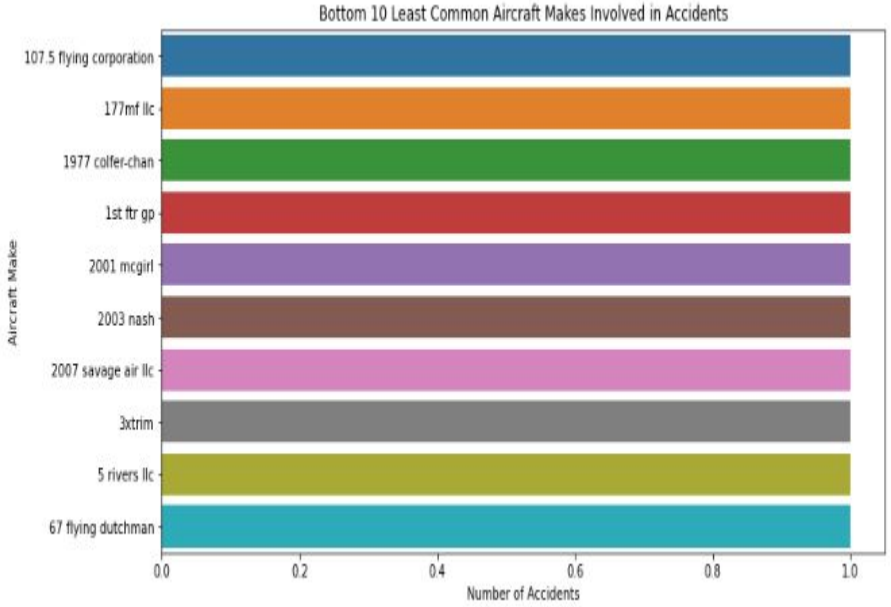


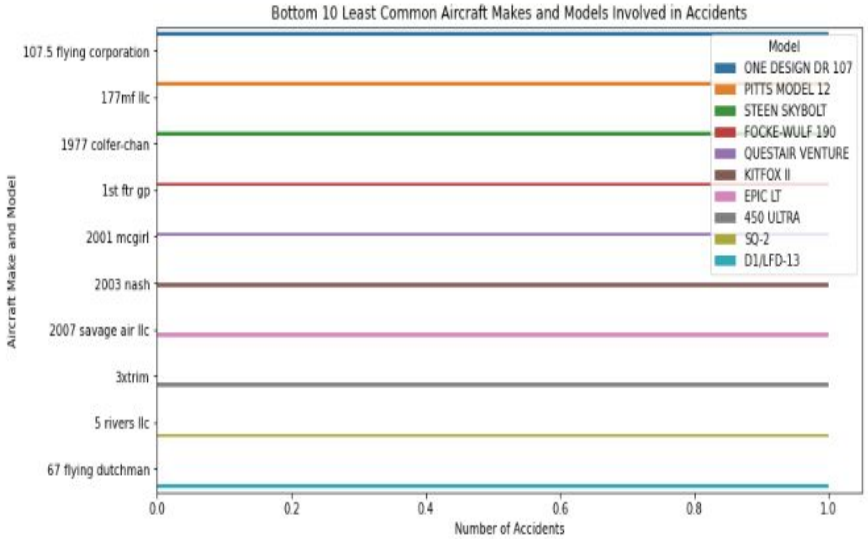


From the above visualizations, we notice that aircrafts with 1 engine have recorded a higher number of accidents and equally resulting to a higher number of injuries.

Aircrafts with the highest and lowest risk

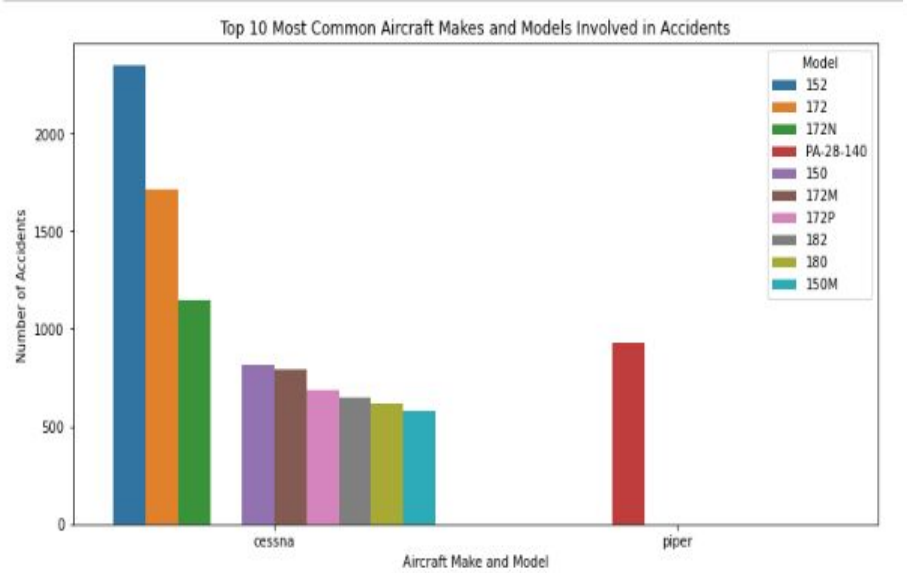
Low Risk Aircrafts:

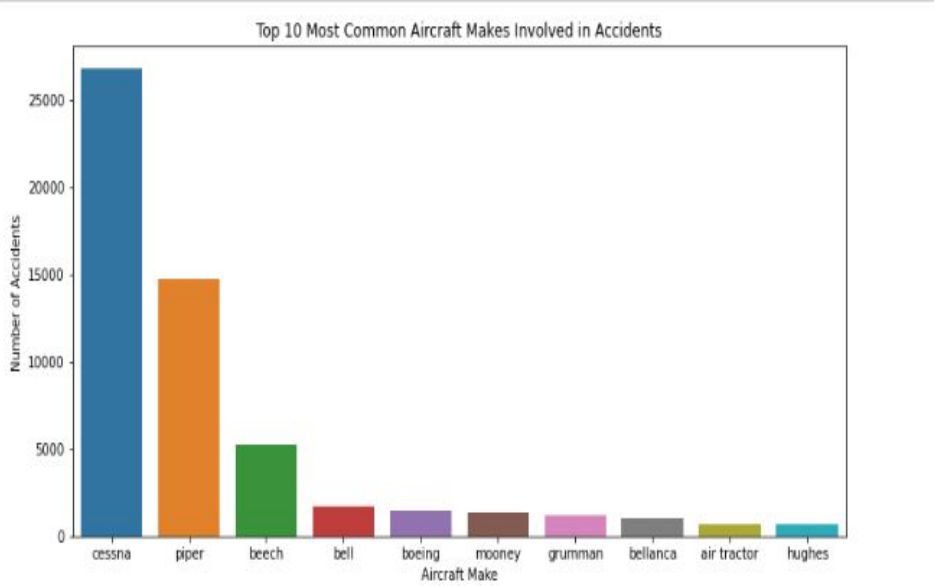




Evidently, There are many models and makes to see in the illustrations above, this is because we discovered that a high number of Aircraft Makes, over 6000, have experienced an accident at least once in the 81 years.
It is easier for us to focus on the Makes that have had multiple cases of accidents.

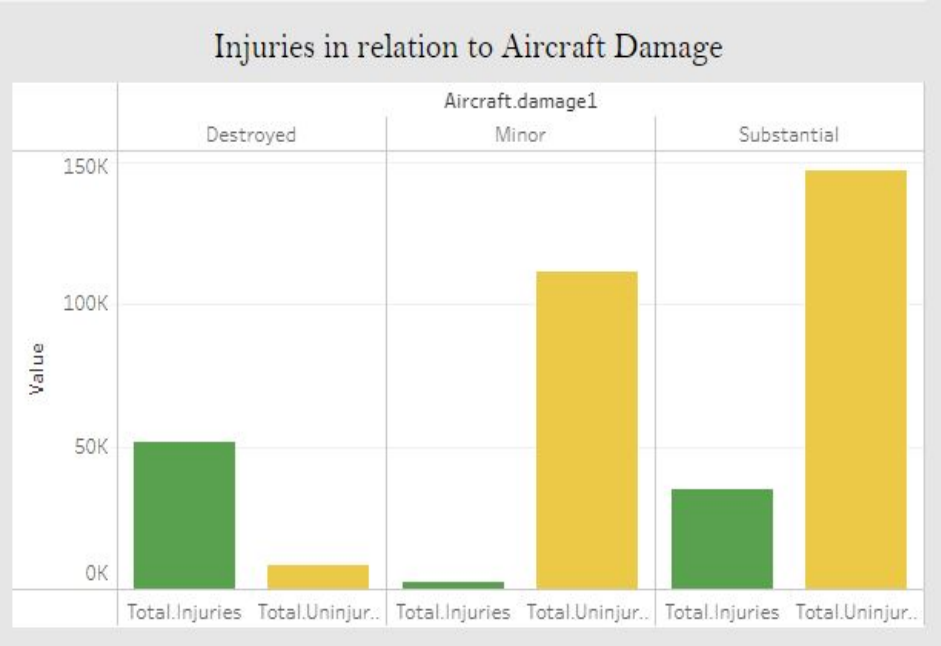
Highest Risk Aircrafts: Cessna and Piper

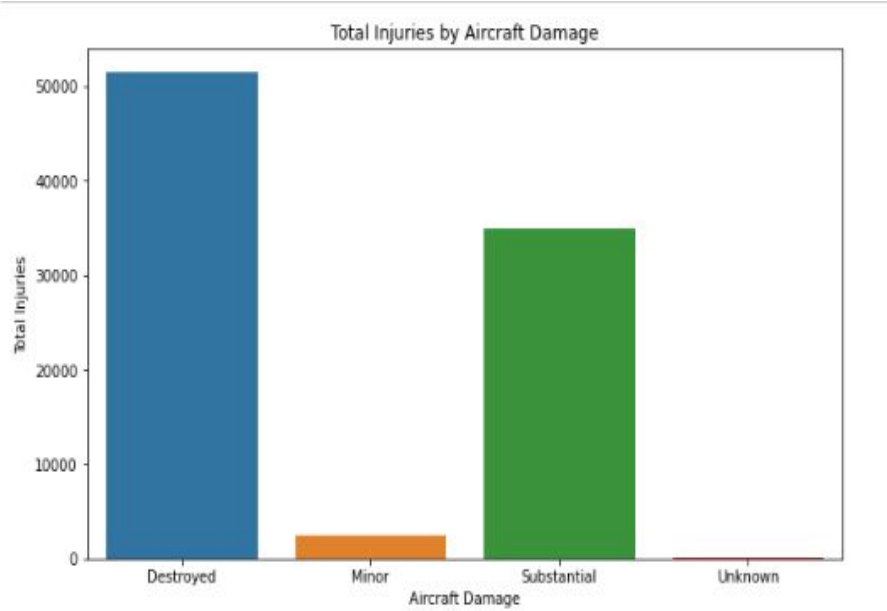




From the above bar charts, we can see the top 10 Aircraft Make as well as the specific Models. When selecting the Make of the Aircraft, we should least consider the Cessna and Piper and to further reduce the risk, we should avoid the top 10 most risky Aircraft Makes.

Aircraft Damage





From the above graphs we can see that the more damage that the accident causes on the aircraft, the higher the number and severity of injuries. Therefore, it is important for us to mitigate the risk of accidents even as we consider investing in the industry.

My Recommendations

It is recommended to prioritize aircraft types with lower risks and establish protocols for managing adverse weather conditions.

1. When selecting the Make of the Aircraft to purchase, we should least consider Cessna and Piper.
2. We should ensure we utilize IMC weather condition aircraft instruments.
3. Consider aircraft types that have 2 or more engines since the acciedent rate is lower.

Thank you!

Presentation by: Joy Gitau

Links & Resources:

Github Link

Tableau Dashboard