# Navigating Aviation Risks: Insights for Fleet Selection

# INTRODUCTION

## Overview

To support the organization's expansion into the aviation sector, a risk analysis has been conducted to evaluate various aircraft models based on historical safety data. The objective was to identify low-risk aircraft that align with the organization's goals for safe, reliable, and sustainable operations. This report provides data-driven recommendations to guide strategic aircraft acquisitions for the new aviation division.

# Questions to answer

**The presentation aims at answering the following questions:**

**1. How does the number of engines relate to the number of accidents.**

**2.How does flight purpose relate to the number of accidents?**

**3.Are there better aircraft models than others in relation to accidents?**

**4.Do Instrument Meteorological Conditions (IMC) contribute to accidents compared to Visual Meteorological Conditions (VMC)?**

**5.Is the number of accidents increasing or decreasing over time?**

# DATA UNDERSTANDING

The analysis is based on data obtained from the NTSB Aviation Dataset, which includes: Source: NTSB (National Transportation Safety Board). Key Variables: Weather conditions (IMC vs. VMC). Aircraft model. Purpose of flight(eg. personal, business etc) The dataset has been cleaned and processed ensuring accuracy and consistency in analysis.

# DATA CLEANING AND MANIPULATION

loaded the aviation dataset and

1.Dropped the data which was duplicated.

2. Cleaned the column names and standardized them.

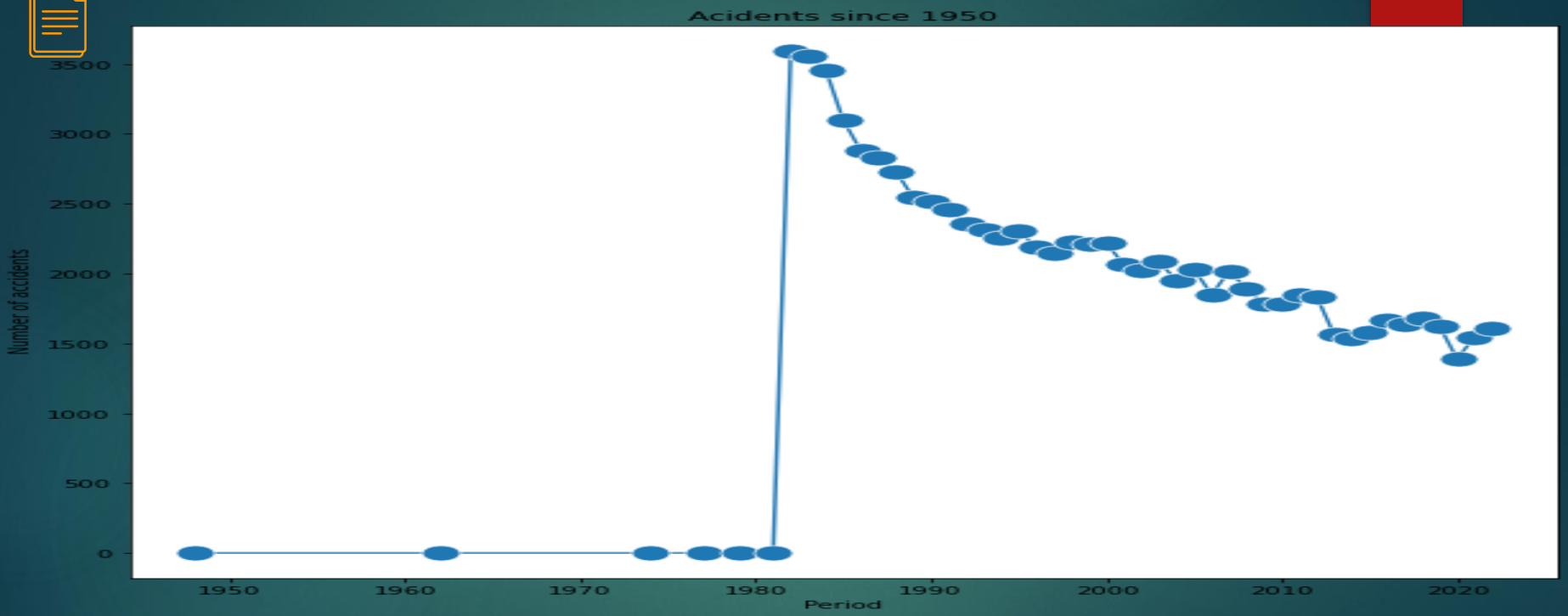
3.Dropped columns which were not essential for the analysis.

4.Fixing date formats, and adding a "Year" column

5. Prepared a clean, well-structured dataset ready for trend analysis and studying flight risks.

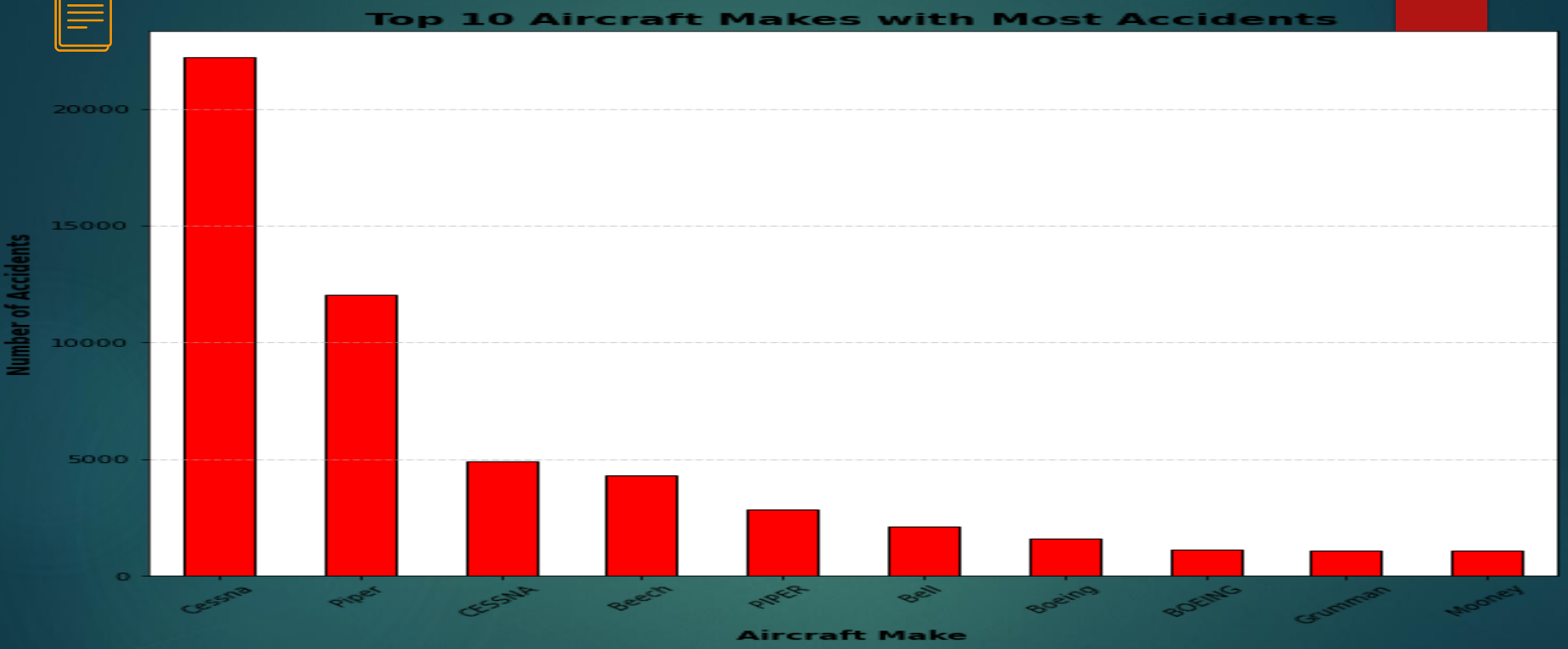
6. Finally imported the cleaned data set

# Trend Analysis of Accidents over Years



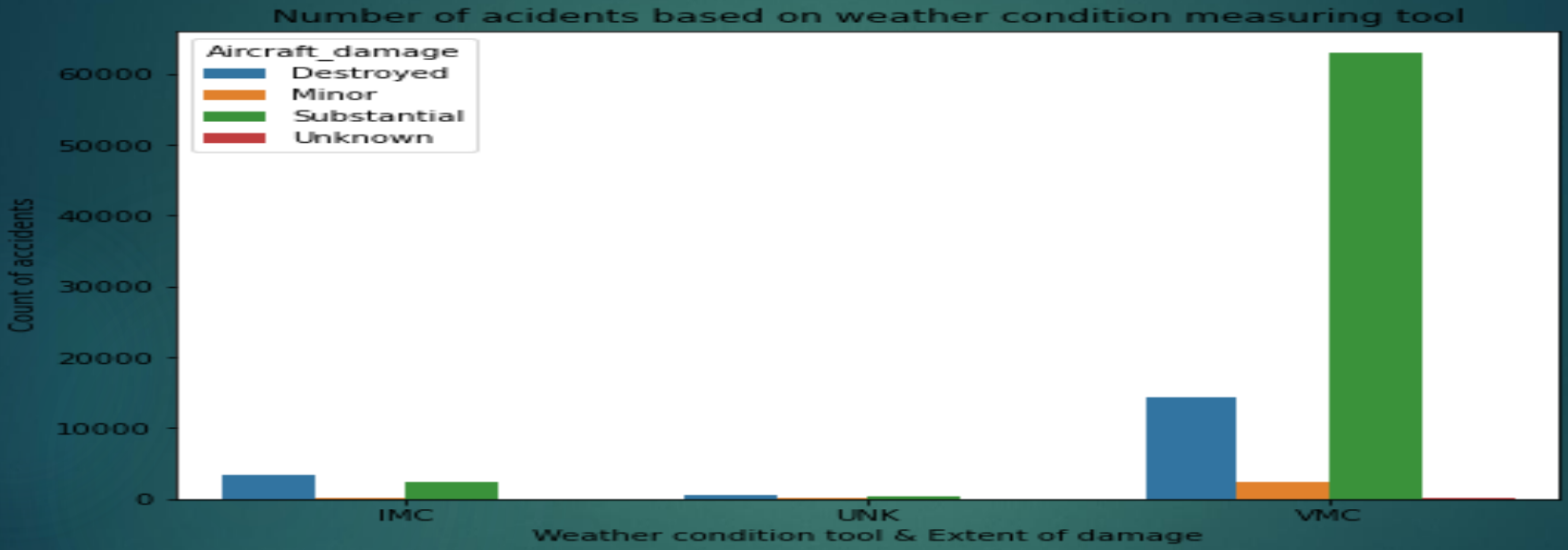

**Overtime there has been a significant decrease in the number of accidents that occur in each year, meaning that the aviation safety has been improved, and I believe it can only get better.**

# Aircraft makes with the most accidents



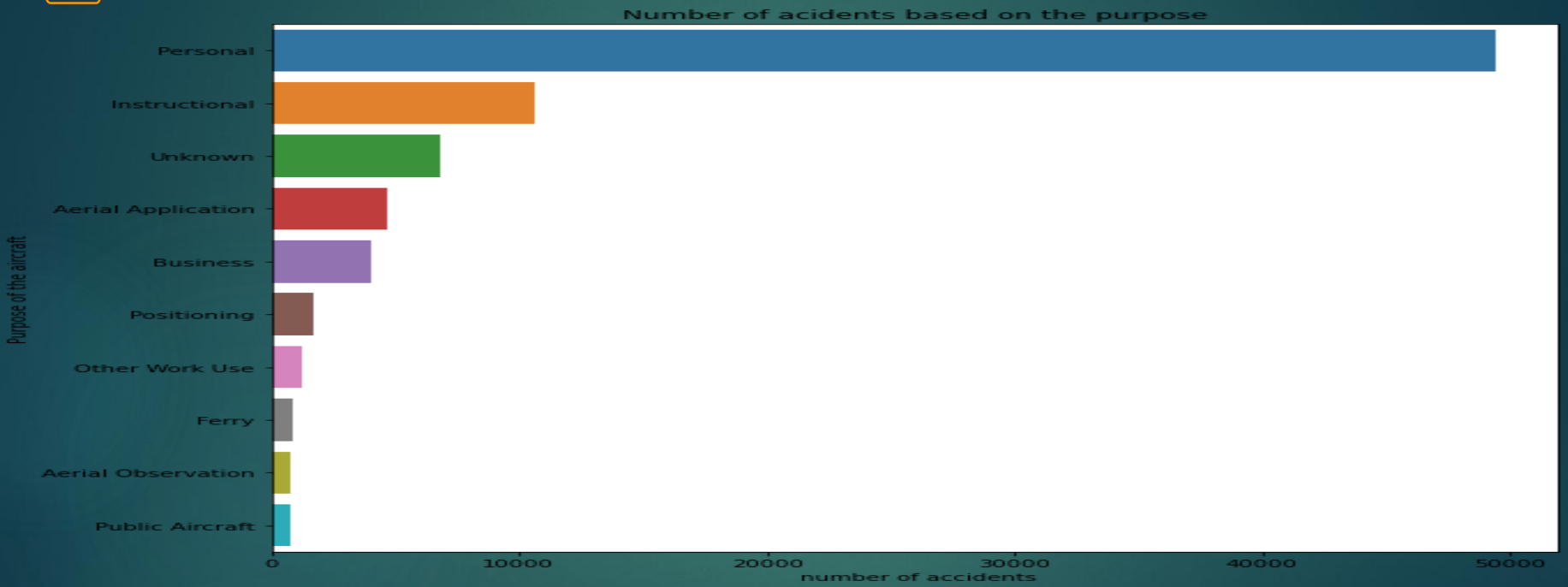

**Cessna are prone to accidents with the highest number of accidents while Mooney has the least number of accidents.**

# Accident Counts and Weather Condition MEASURING Tools



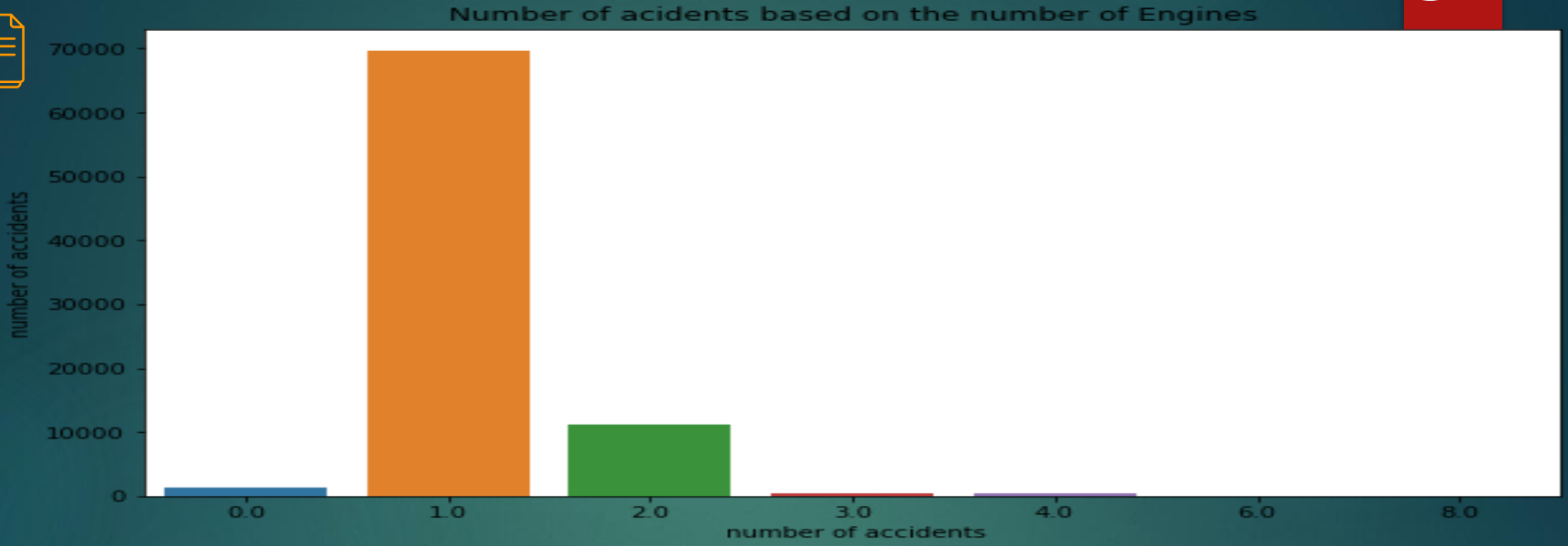

**There are high rate of accidents when pilots fly without relying on instruments that is VMC. In cases where the pilots use the instruments that is IMC, there is little and close to none levels of accidents.**

# Number of accidents based on the purpose



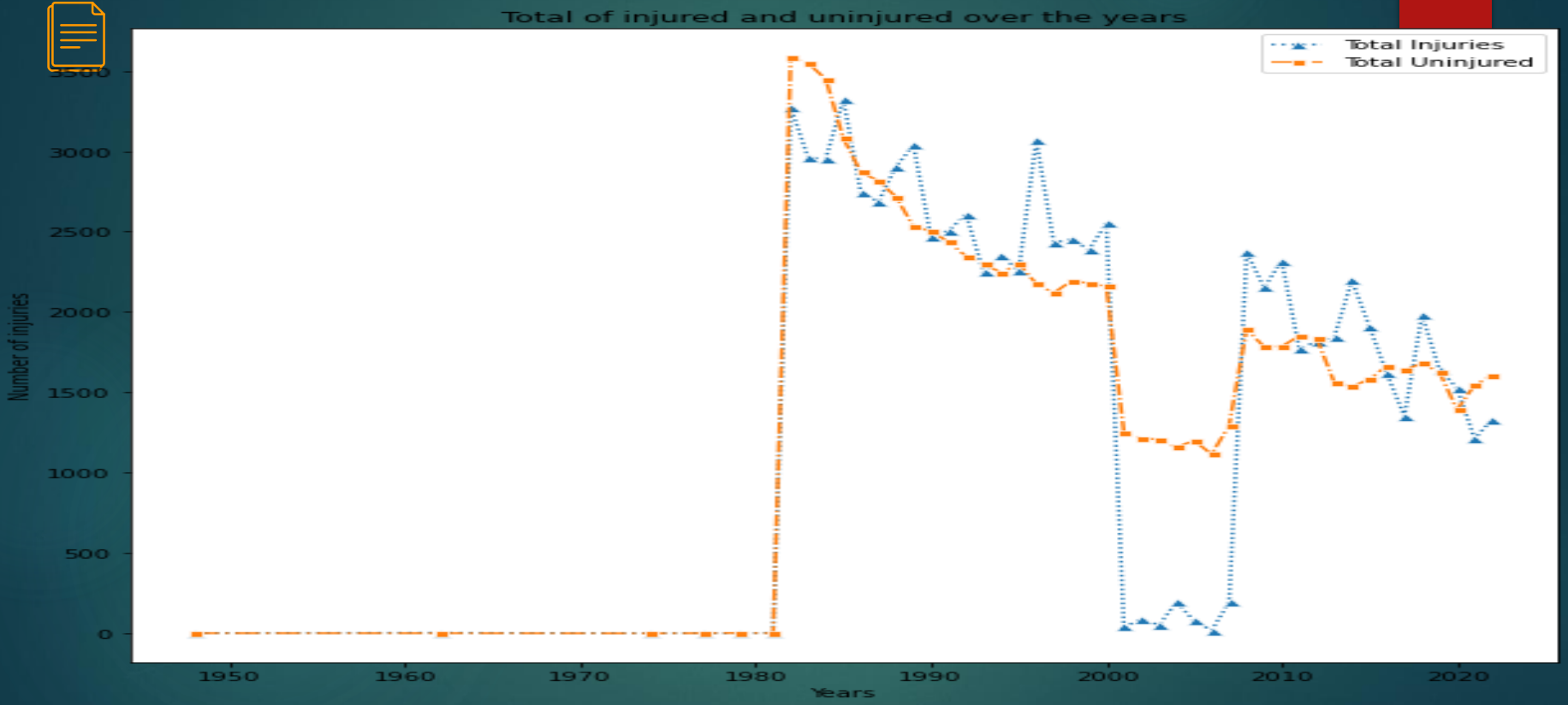

**Aircrafts whose purpose is personal have the highest numbers of accidents occuring, but I can consider the organization lucky because it wants to conduct its endevour as a business, thus its purpose will be "public aircraft" which has the least amount of accidents.**

# Accidents in relation to number of Engine




**Aircraft with one engine result in the highest number of accidents. The number of accidents deacrease with an increase in the number of engines. From two to four engines there is a significant decrease in the number of accidents, but theorganization should consider acquiring aircrafts with more than six engines whose accident numbers are close to none.**

# Number of injuries and the uninjured




**There have been a reduction in the number of injuries due to aircraft accidents over time . While the number of uninjured has been decreasing which is not a good sign.**

# Recommendations



1. Aviation accidents are notably influenced by weather conditions, with clear skies (VMC) accounting for the majority due to higher flight activity, while adverse conditions (IMC) pose significant risks, underscoring the importance of robust pilot training and advanced navigation systems.
2. The organization should consider acquiring aircraft, Boeing, Grumman or Mooney, which have considerably low accidents as compared to the other types of aircraft.
3. In relation to the number of engines, the organization should acquire aircrafts that have more than six engines. In my analysis I have discovered that aircrafts with less than six engines are often involved in accidents while those with more than six engines are close to none.
4. Since the organization is considering to take up this venture as a business, they have an advantage because public aircrafts have considerably low accident levels as compared to the use of aircrafts for personal purposes.
5. The organization should venture into this business because over the years the number of, the number accidents has been reducing, thus injuries have been decreasing significantly while the number of uninjured people has been increasing, this is a sign that safety measures have been improving over the years and it can get better.

**Any questions?**

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