DATAN AFRICA

Committed to service

ASSESSING LOW-RISK AIRCRAFT FOR AVIATION EXPANSION

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Content

Overview

Introduce the project. Provide a quick background and rationale. Briefly share its overall scope as well as expected outcomes.

Datan Africa is interested in purchasing and operating airplanes for private and commercial purposes to diversify its portfolio. The risks of this venture are unknown and an in-depth risk analysis is required to determine the aircraft with the lowest risk. The data for this analysis was obtained from the National Transportation Safety Board, including aviation accident data from 1962 to 2023 about civil aviation accidents and selected incidents in the United States and international waters.

Objectives

Objective 01

.To determine the aircraft with the lowest risk.

Objective 02

To translate findings into actionable insights.

DATAN
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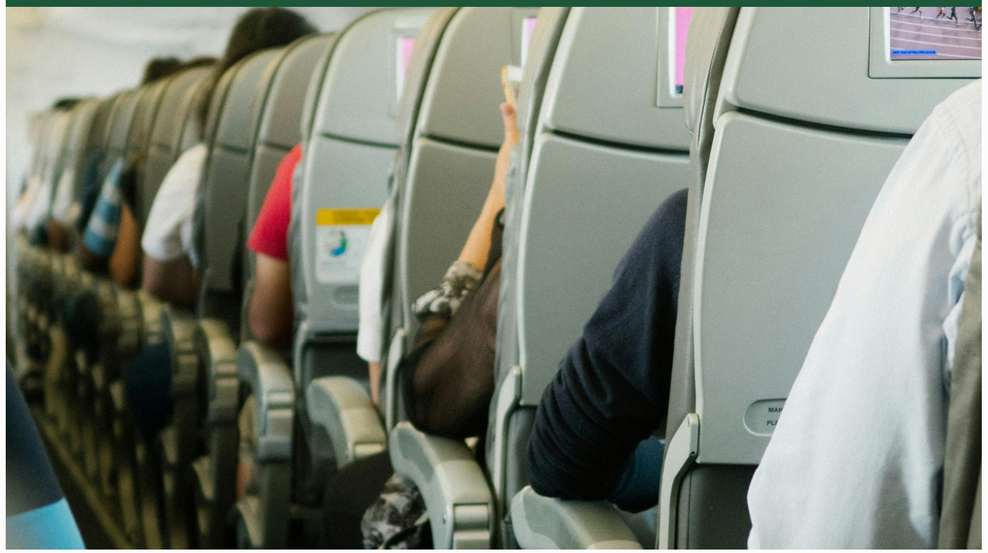
BUSINESS UNDERSTANDING

Commercial aircrafts



Commercial airliners are used to haul passengers and freight on a scheduled basis between selected airports

Private aircrafts

Private aircraft are airplanes or helicopters owned or operated by individuals, corporations, or private organizations for personal or business use, rather than commercial airline services.

Potential risks

The greatest risk to operating aircraft is the risk of accidents. Accidents result in the loss of lives as well as damage to aircraft.

AIM: PURCHASE AND OPERATE PLANES FOR COMMERCIAL AND PRIVATE USE

BUSINESS QUESTIONS

- How safe is it to operate commercial and private aircraft?
- Which aircraft category is most prone to accidents?
- Are there certain locations with a high number of accidents?
- What is the survivability rate in case of an accident?
- How does weather affect aircraft accidents?
- What is the distribution of accidents based on the make, model, and purpose of flight?
- What is the general distribution of accidents based on engine type.

Data Understanding

Data source: National Transportation Safety Board (USA)
Link:https://www.kaggle.com/datasets/khsamaha/aviation-accident-database-synopses

Data description
Years:1962-2023
Columns:31
Rows:88889
Missing values:Yes

15 Relevant columns were chosen for analysis

- **Event Date**
- **Country**
- **Injury Severity**
- **Aircraft Damage',**
- **Make**
- **Model**
- **Amateur Built**
- **Number Of Engines**
- **Engine Type**
- **Purpose Of Flight**
- **Total Fatal Injuries**
- **Total Uninjured**
- **Weather Condition**
- **Broad Phase Of Flight**

DATA ANALYSIS

Data cleaning and preparation

Data cleaning

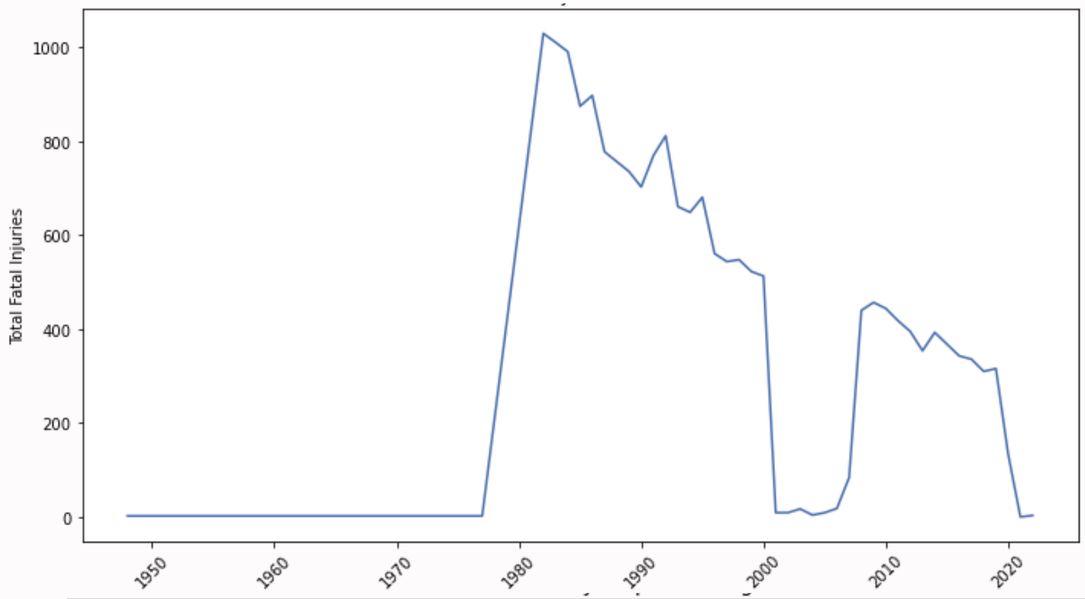
1. Standardising the column names
2. Dropping columns with missing values.

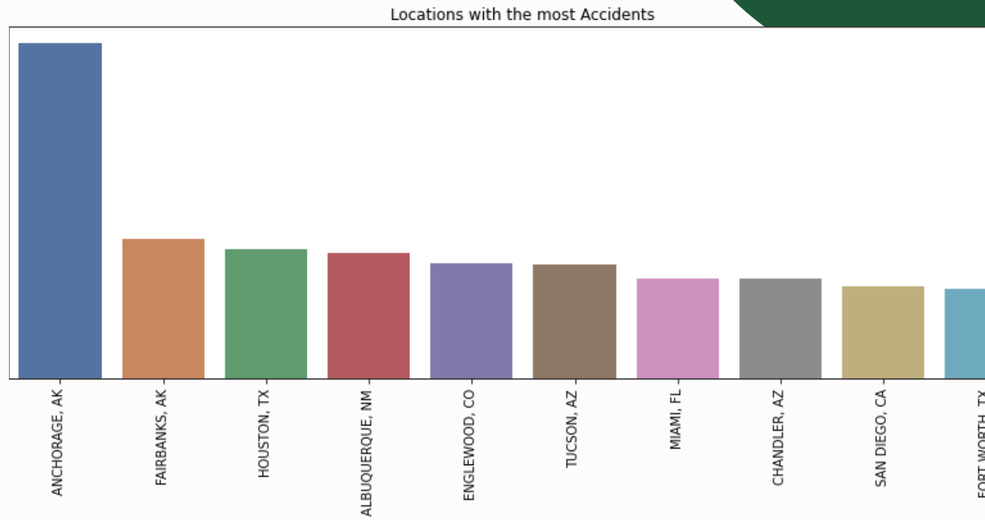
TOOLS USED

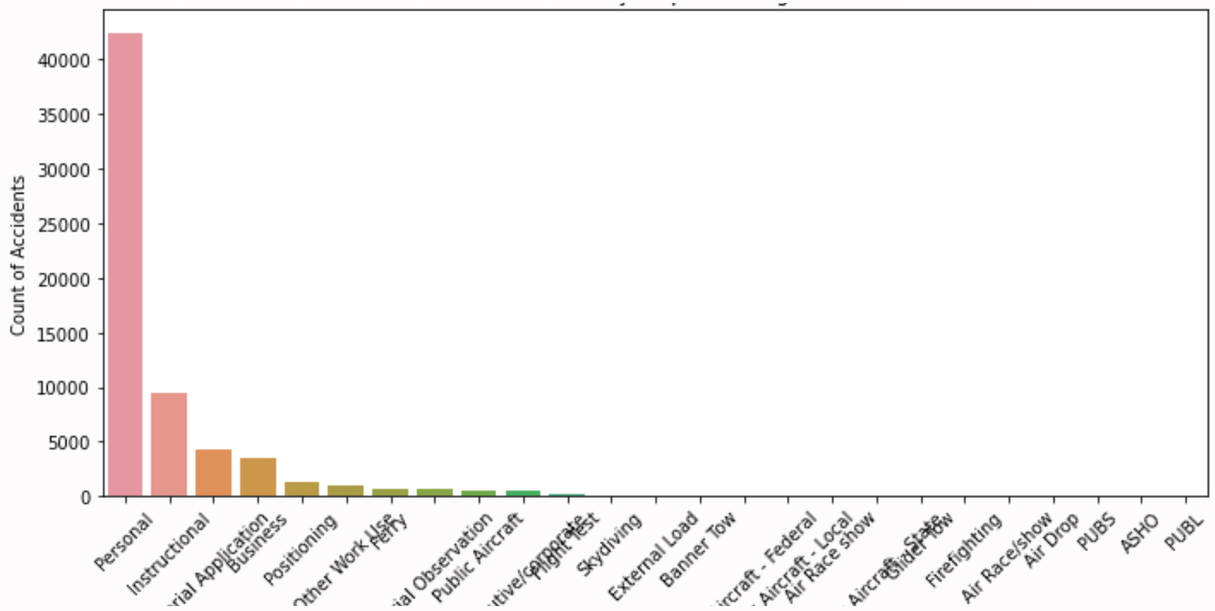
JUPYTER NOTEBOOK

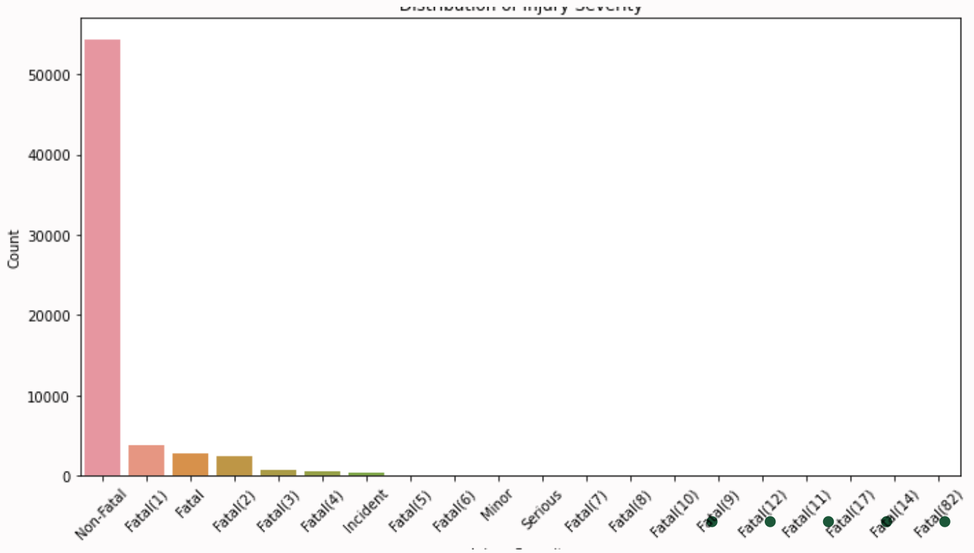
PYTHON PANDAS LIBRARY

DATA VISUALIZATION









RECCOMENDATION

RECOMMENDATION ONE

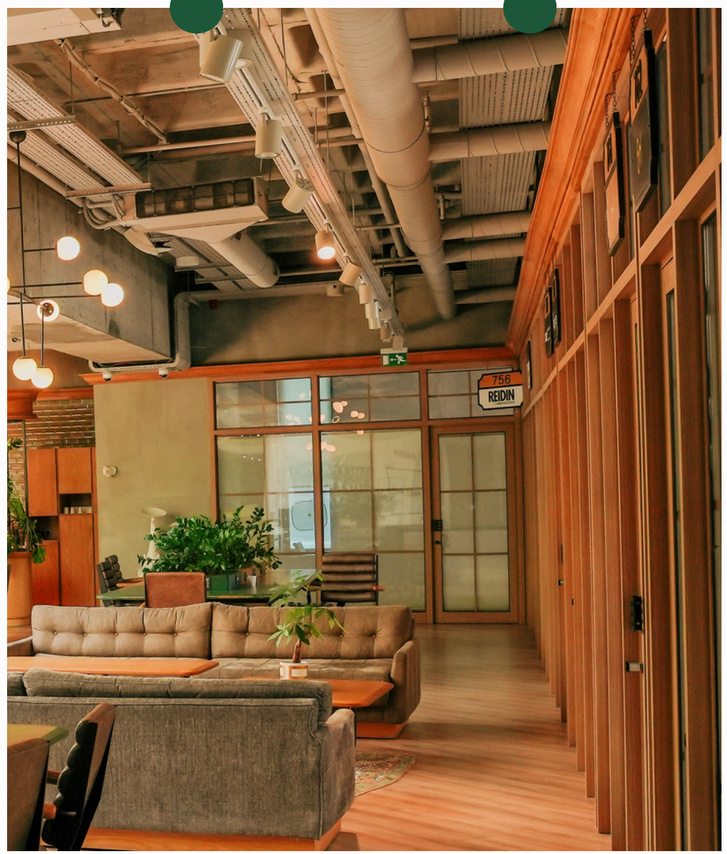
Datan Africa should invest in locations with low accidents these include Johnson Creek, Hollywood,and Opelika among other areas with the lowest number of accidents.

RECOMMENDATION TWO

Based on aircraft make and model, CESSNA was found to have the highest number of accidents in the personal use category. I recommend the Flying Dutchman and any other make that falls within the last ten of our visualization for personal use. Aircraft with reciprocating engines should be avoided.

Recommendation three

Weather is directly proportional to the number of accidents therefore areas with bad weather should be avoided. I also recommend turboshaft engine type since they have fewer accidents.



CONCLUSION

The analysis suggests that Datan Africa can safely invest in the aviation industry, as aviation accidents have declined significantly over the years. Location plays a key role, as weather and possibly high air traffic influence accident rates. Aircraft used for business purposes have fewer accidents than personal aircraft, with Cessna and Piper models being most prone to accidents among smaller planes. Additionally, reciprocating engines are linked to a higher number of accidents.

Most accidents result in substantial damage to the aircraft, but injuries are generally non-severe, and incidents primarily occur during takeoff and landing. Improving pilot training and airport visibility could help reduce these accidents. However, Datan Africa should also consider other factors like aircraft maintenance costs, air traffic correlations with regional economies, and aircraft purchase costs to ensure a good return on investment.

NEXT STEPS

1.Further data collection on the relationship between air traffic and the economy of a place .
2.Purchase operation and maintenance cost comparisson between private and commercial aircrafts
3.ROI analysis.

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