

Vincent-Muteti / Phase1-Project

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|--------------------------------|--|-------------------------|--|
| Vincent-Muteti                 | Added Slide Presentation               | ddde1ef · 2 minutes ago |  |
| Presentation.pdf.pdf           | Added Slide Presentation               | 2 minutes ago           |  |
| README.md                      | Added detailed README                  | yesterday               |  |
| aviation-accident-data-2023... | Added Dataset and Notebook             | 3 days ago              |  |
| cleaned_aviation_data.csv      | Prepared Data for Tableau Visualiza... | 2 days ago              |  |
| index.ipynb                    | Added Slide Presentation               | 2 minutes ago           |  |

README

# Aviation Accident Analysis

## Project Overview

This project analyzes historical aviation accident data to uncover patterns, trends, and insights. The goal of this project is to apply data cleaning, visualization using Python and Tableau, dashboard creating in order to support a data driven recommendations to the Head of Aviation Division on which Aircrafts to consider purchasing and make strategic procurement decisions.

## Objectives

The objective of this project is to:

- Analyze aviation accident trends over a specific period.
- Identify high-risk countries and high risk aircraft types.
- Explore the accident-fatality relationship.
- Build visualizations using Python and Tableau to support and provide insights.

- Provide actionable recommendations on aircraft purchases.

## Business Questions

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- What are the most common aircraft types involved in accidents?
- Which countries and operators appear most frequently?
- How do fatalities trend over time?
- Which year recorded the highest number of aviation accidents?
- How have aviation accidents changed over time?
- What safety recommendations can be derived from these findings?

## Dataset

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- **Source:** Provided dataset
- **Size:** 23967 Rows 9 Columns
- **Columns:**
  - 'date' - Date of Accident
  - 'type' - Aircraft Type
  - 'registration' - Aircraft Registration number
  - 'operator' - Operating Aircraft
  - 'fatalities' - Number of Fatalities
  - 'location' - Accident Location
  - 'country' - Country of Accident
  - 'cat' - Category of Accident
  - 'year' - Year of Accident

## Methodology

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- **Data Cleaning:**
  - Removed duplicates and handled missing values.
  - Filled missing values with "Unknown".
  - Standardized column naming for Tableau compatibility.
- **Tools Used:**
  - Python i.e Pandas, Matplotlibs, Seaborn and Jupyter Notebook
  - Tableau for Dashboard creation
  - GitHub

## Visualizations

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- Python

- Accidents per Year using Bar Chart
  - Fatalities per Year using a Line Graph
  - Top 15 Aircraft Type by Accidents using Bar Graph
  - Fatalities per Year using Scatter Plot
  - Fatalities per Decade using Line Graph
  - Top 10 Countries by Accidents using Bar Graph
- **Tableau Dashboard**
    - Top 10 Countries by Accidents
    - Aircraft Type by Number of Accidents
    - Operator by Number of Accidents
    - Aircrafts by Number of Fatalities
    - KPIs (Total Accidents, Total Fatalities)

## Conclusion

- Aviation accidents have shown a remarkable decline over the years since 1944 whereby a higher number was recorded.
- A few countries account for the majority of the accidents for example USA and Russia.
- Certain Aircraft types are more involved in accidents for example the Douglas C-47A(DC-3).
- The data-driven insights enable the aviation division to make **Evidence-based procurement decisions** by prioritizing aircraft with proven safety records, the division reduces operational risk, saves costs, and improve passenger trust in its operations.

## Recommendations

- Purchase aircrafts types with **Low accident and fatality records**.
- Avoid aircrafts types with **High historical accident rates** e.g Douglas C-47A(DC-3).
- Give priority to modern aircraft models that show **Improved safety overtime**.
- Consider partnership with operators who maintain strong safety records.

## Tableau Dashboard

- You can interact with the live dashboard here:
  - [https://public.tableau.com/authoring/Project\\_17593225254100/AirCrashAnalyticsDashboard#1](https://public.tableau.com/authoring/Project_17593225254100/AirCrashAnalyticsDashboard#1)

## Releases

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## Languages

- Jupyter Notebook 100.0%