Aviation Safety Analysis: Business Insights

Data-Driven Recommendations to Reduce Accidents

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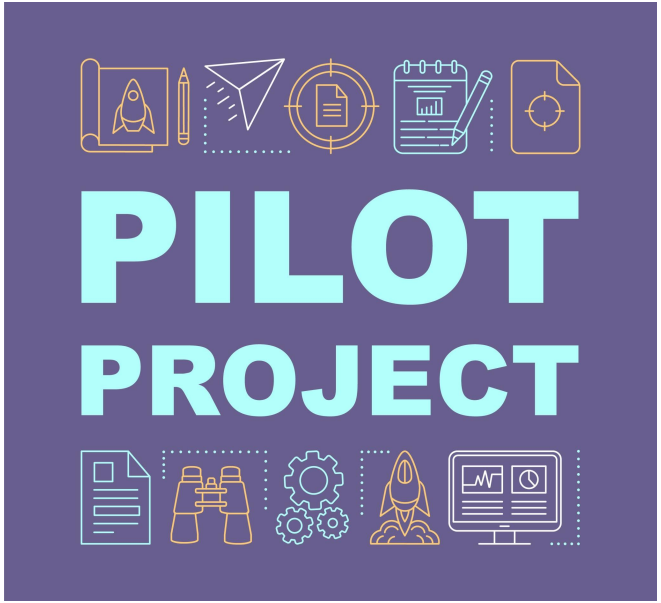
Project Overview

Goal: Improve aviation safety by identifying key factors contributing to incidents and accidents using data-driven insights.
Audience: Business stakeholders in aviation safety, airline management, and policy planning.



Business Understanding

Problem Statement:
How can we reduce aviation-related accidents by understanding the patterns and causes behind them?

Business Impact:

- Saves lives
- Reduces operational costs
- Lowers legal liabilities
- Builds public trust

Data Understanding

Source: U.S. NTSB aviation accident database
Data Coverage: Various aircraft types, flight conditions, and outcomes

Key Features:

- Event_Date
- Aircraft_Damage
- Injury_Severity
- Aircraft_Category
- Broad_Phase_of_Flight
- Weather_Condition

Data Analysis Approach

Techniques Used:

- Exploratory Data Analysis (EDA)
- Data Cleaning
- Feature Selection
- Visualizations

Explained Simply:

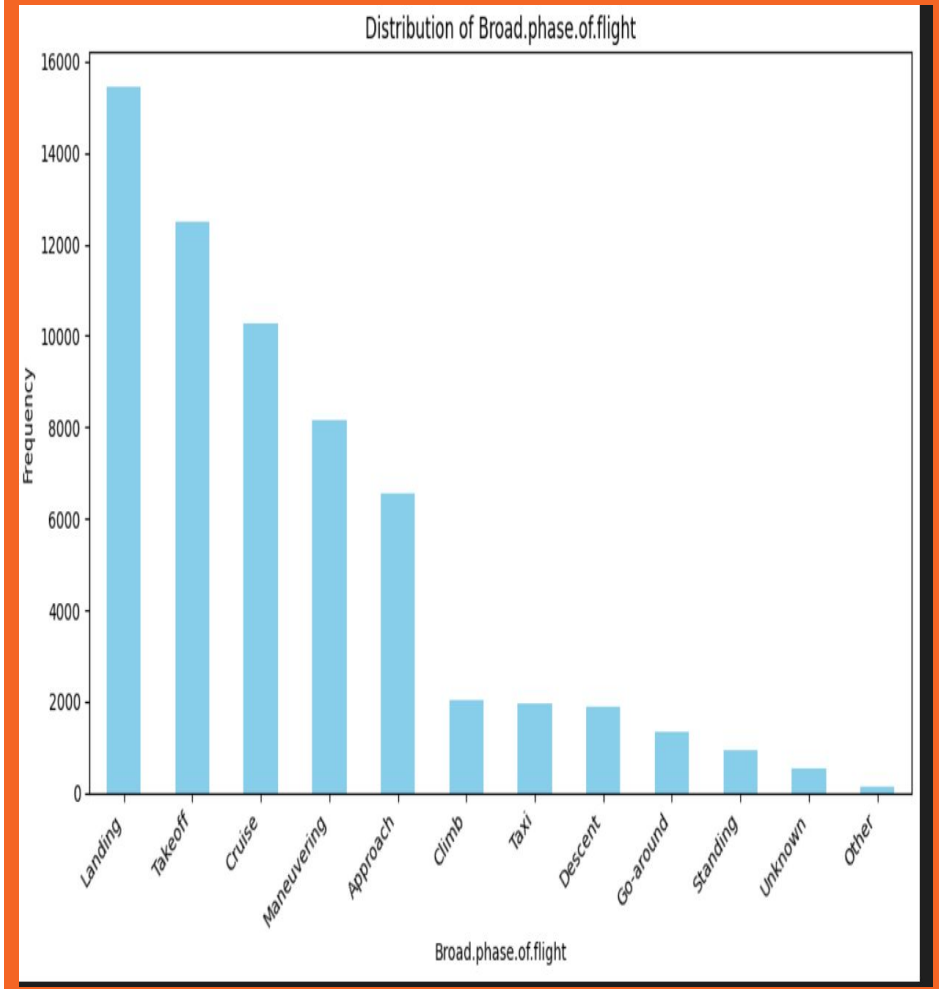
- *EDA*: Spotting patterns and outliers
- *Cleaning*: Removing or fixing bad data
- *Visuals*: Turning data into clear pictures

Flight Phase

Finding: Most accidents occur during *landing* and *takeoff*
Recommendation:

- Enhance pilot training for critical phases
- Invest in auto-landing/takeoff support

Visualization: Bar chart – Accidents by Phase of Flight

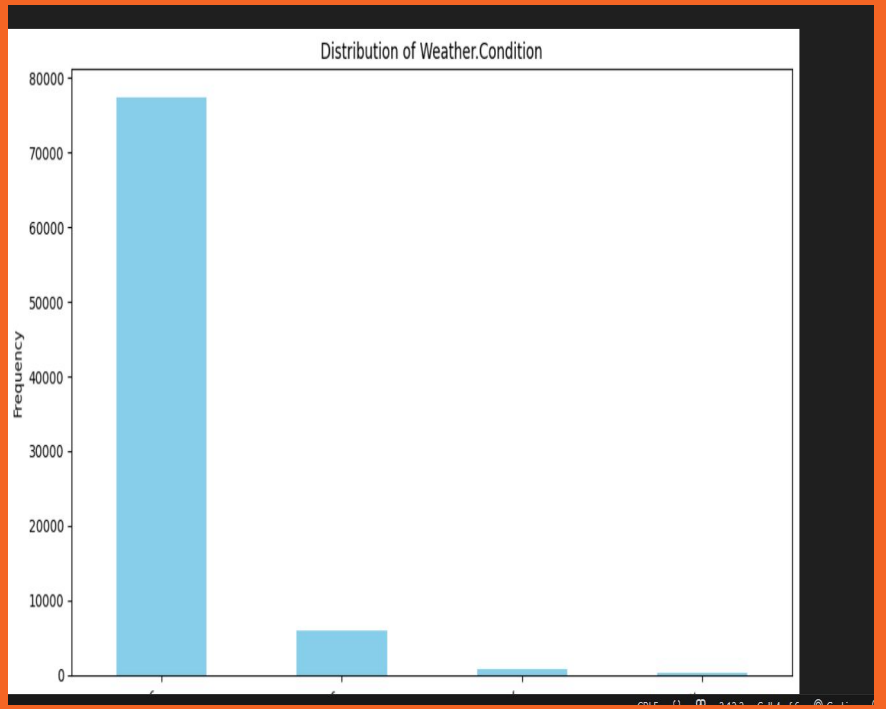


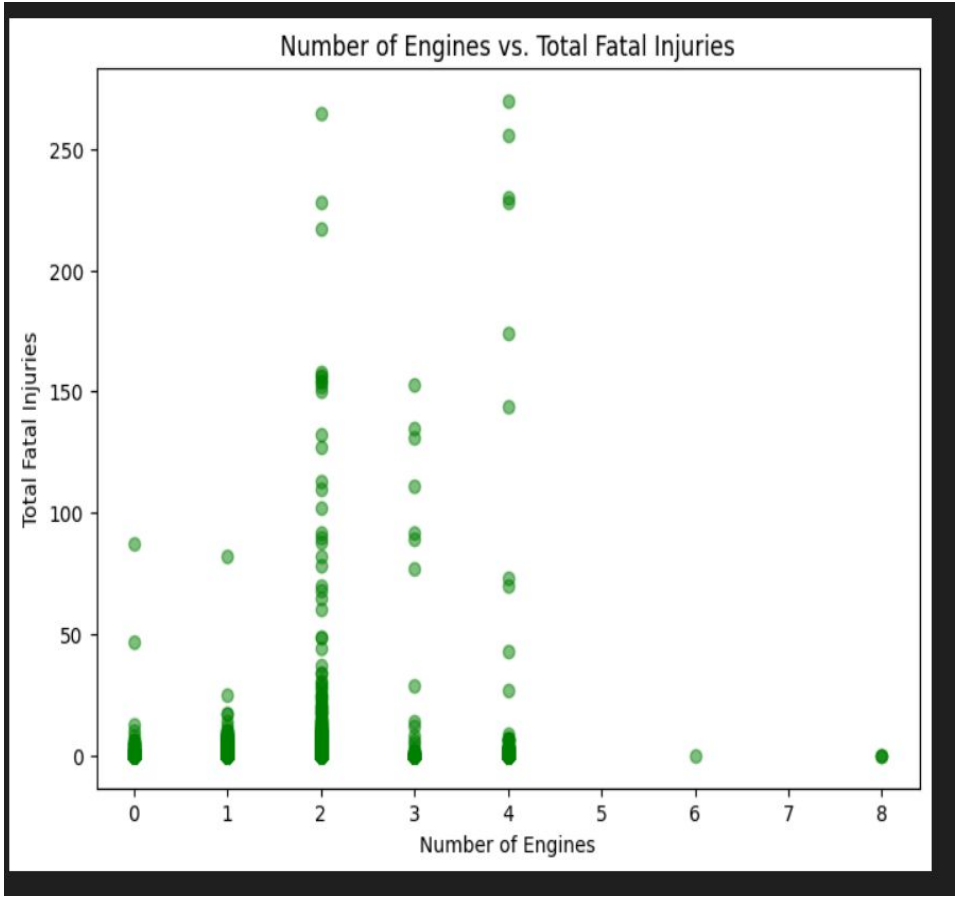
Insight #2 – Weather Conditions

Finding: Poor weather significantly increases accident rates
Recommendation:

- Improve weather protocols
- Real-time weather alert systems

Visualization: Grouped bar chart – Accidents by Weather Condition





Insight #3 – Aircraft Category

Finding: General aviation has the highest fatal injury rates
Recommendation:

- Target inspections and campaigns at small aircraft owners/operators

Visualization: Pie chart – Fatal Injuries by Aircraft Category

Summary of Recommendations

1. Enhance training during takeoff and landing
2. Improve real-time weather response systems
3. Strengthen oversight on general aviation

Story for illustration purposes only

Next Steps

- Build predictive models for risk forecasting
- Expand dataset to include global aviation incidents
- Collaborate with aviation authorities for policy improvements

Slide 11: Thank You

Questions?

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