

# Aviation Accident Data Analysis

Business Insights & Recommendations

**Objective:** Helping a company decide whether to venture into the aviation industry and make informed purchasing decisions based on data analysis.

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# BUSINESS UNDERSTANDING

**Objective:** Help the company make data-driven decisions about aircraft purchasing and whether to enter the aviation industry.

**Key Questions:**

1. Which aircraft types have the lowest accident rates?
2. What conditions (weather, purpose of flight, etc.) increase accident risk?

**Why It Matters:** Understanding risks is crucial for minimizing operational costs and safeguarding lives in the aviation industry.

# Data Overview

## **Dataset Overview:**

➤ Total records: 90,348 accidents

### ➤ **Key Variables:**

- ✓ Aircraft Make/Model
- ✓ Total Fatal Injuries
- ✓ Weather Conditions
- ✓ Number of Engines
- ✓ Purpose of Flight

**Initial Observations:** Significant missing data for certain columns like Schedule and Air Carrier,  
which were dropped to focus on key variables for analysis.

# Data Cleaning Process

## **Handling Missing Values:**

Used median for columns like Total Fatal Injuries to fill missing values.

Dropped non-essential columns like Accident Number, Airport Code, and Schedule, which do not contribute meaningfully to the analysis.

## **Outlier Handling:**

Detected and handled outliers in critical columns (e.g., Total Fatal Injuries) to prevent them from skewing the analysis.

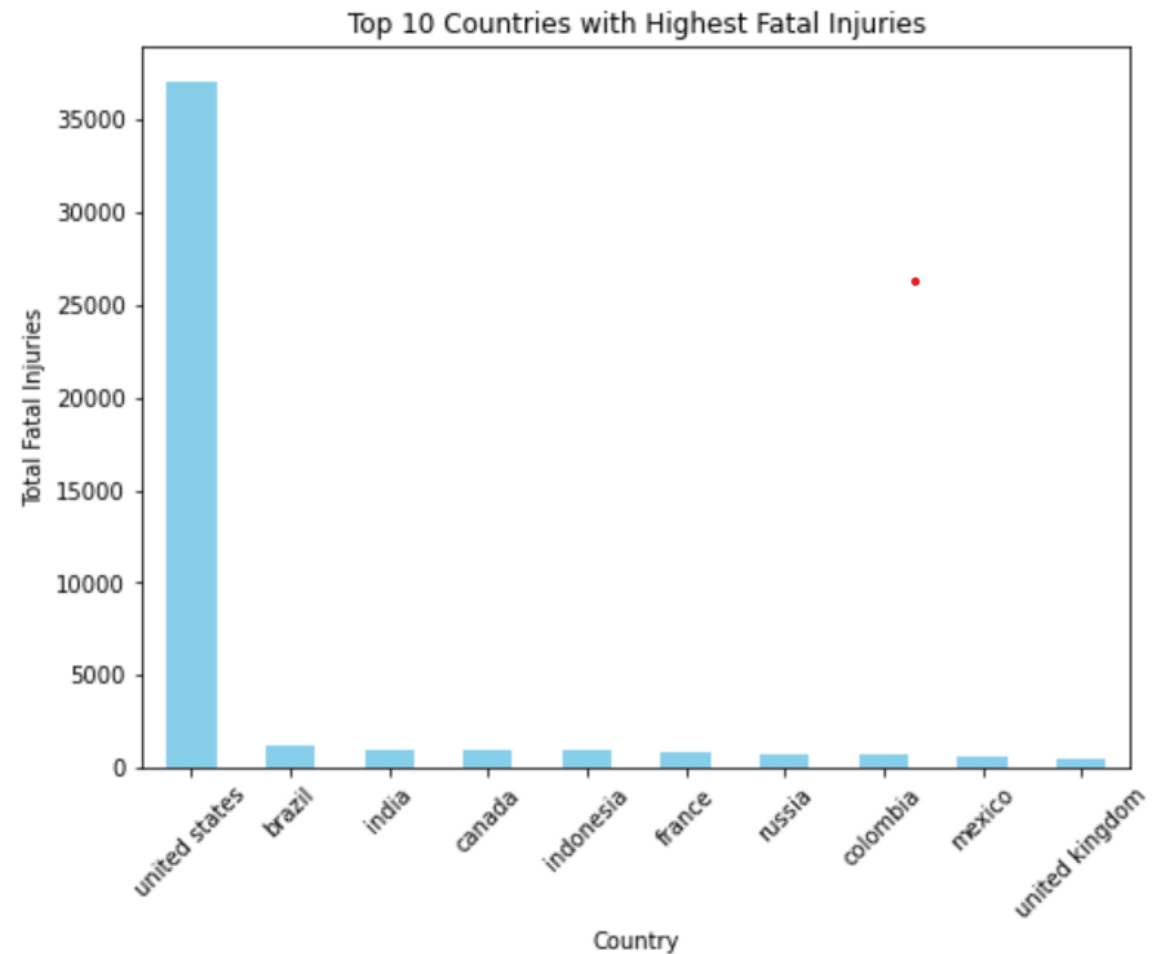
**Conclusion:** The dataset is now cleaned and ready for deeper analysis, ensuring reliable insights.

# Fatal Injuries by Country

The U.S. leads in total fatal injuries with over 37,000 cases, followed by Brazil and India.

**Suggestion:** If the company plans to operate in these regions, they should consider stricter safety measures.

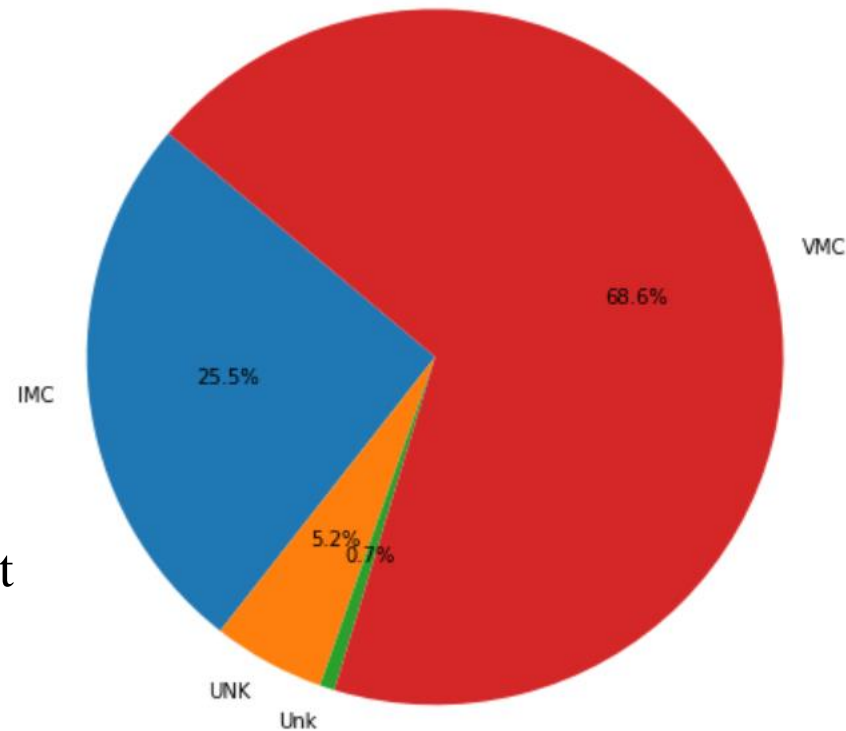
**Business Advice:** This insight suggests high-risk regions that may require additional considerations for operations and safety protocols.



# Impact of Weather on Accidents

Majority of accidents occurred under VMC  
(Visual Meteorological Conditions) –  
over 32,000 fatalities.

**Business Advice:** Weather alone does not dictate accident risk, and the company should invest in training and maintenance to mitigate other risks.

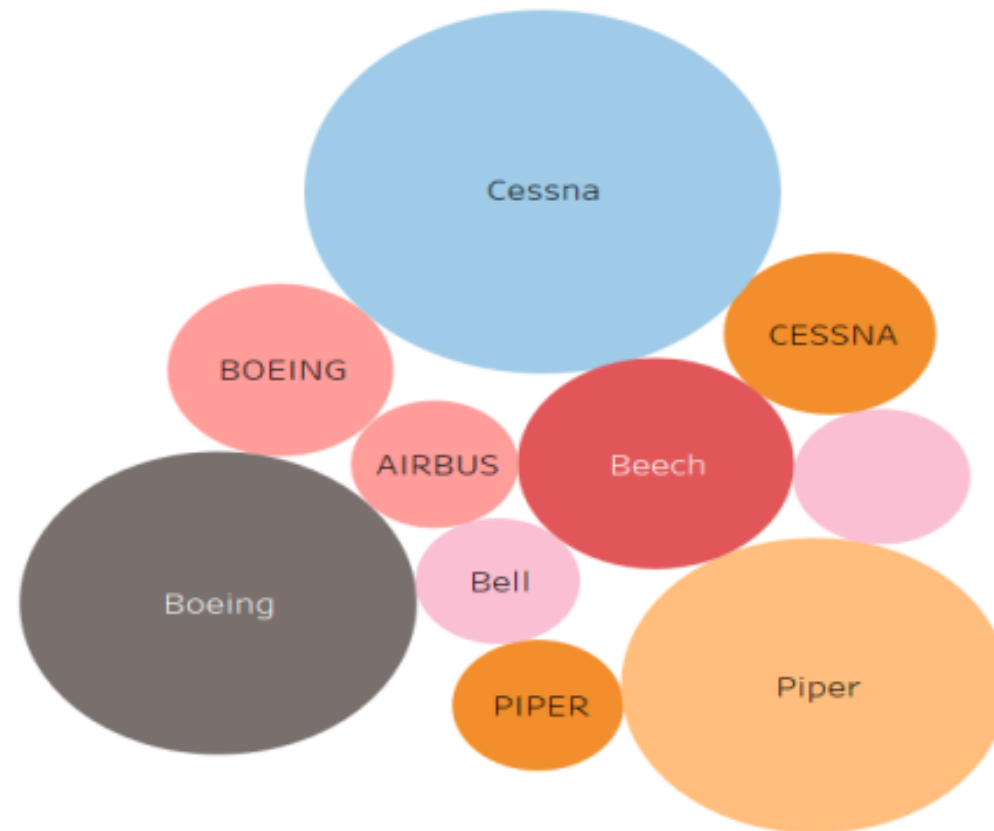


# Aircraft Make vs. Total Fatal Injuries

Certain aircraft manufacturers have higher fatal injury counts, such as **Kitty Hawk** with 8 fatalities, followed by **JOBY AERO INC** and **Piasecki Acft. Corp.**

**Business Advice:** Carefully assess the safety record of specific aircraft models before purchasing. Favor models with Fewer fatalities and strong safety records.

Total Fatalities by Make

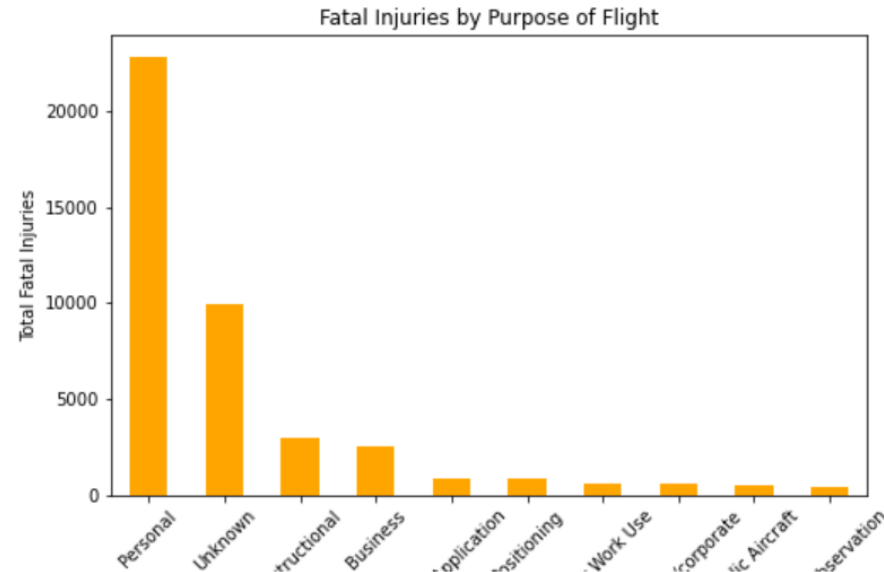


# Flight Purpose vs. Total Fatal Injuries

Personal flights have the highest fatal injury rates (over 22,000), followed by unknown flight purposes.

Other high-risk flight purposes include Instructional and Business flights.

**Business Advice:** Encourage stricter safety protocols for personal and instructional flights, which tend to be riskier.





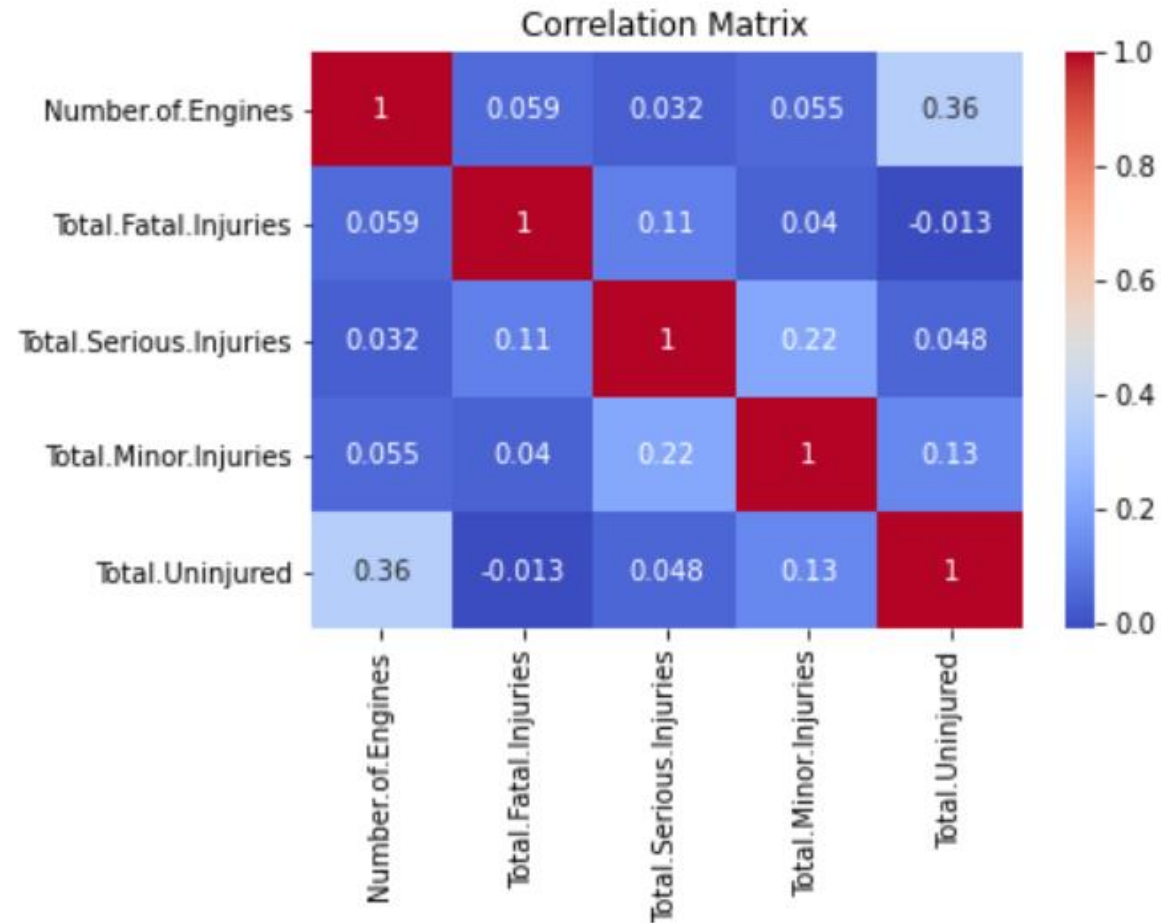
# Correlation Analysis

## Key Insights:

Moderate positive correlation between **Number of Engines** and **Total Uninjured** (0.40) suggests more engines may improve safety.

## Business Advice

While engine count can impact safety, focus on a holistic approach considering other variables like light purpose, model, and weather conditions.



# Recommendations & Next Steps

## **Recommendations:**

- Prioritize aircraft with a better safety track record and lower fatality rates.
- Operate with heightened caution in regions with higher fatality rates (e.g., the U.S, Brazil).
- Consider investing in training and maintenance to mitigate risks not related to weather.
- Focus on safety improvements in personal and instructional flights, as these have the highest risk.

## **Next Steps:**

- Dive deeper into specific aircraft models to evaluate safety.
- Conduct further analysis incorporating external data such as pilot experience and aircraft age.
- Create an action plan to minimize risks based on identified high-risk factors.

# Thank You for Your Time!

We appreciate your attention and consideration.

If you have any questions or need further details, feel free to ask.

We hope our insights will help in making informed decisions regarding the aviation industry.

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Github: <https://github.com/zaenhakeem/dsc-phase-1-project-v3>