Flight Risk: A Data-Driven Analysis of Aviation Accidents
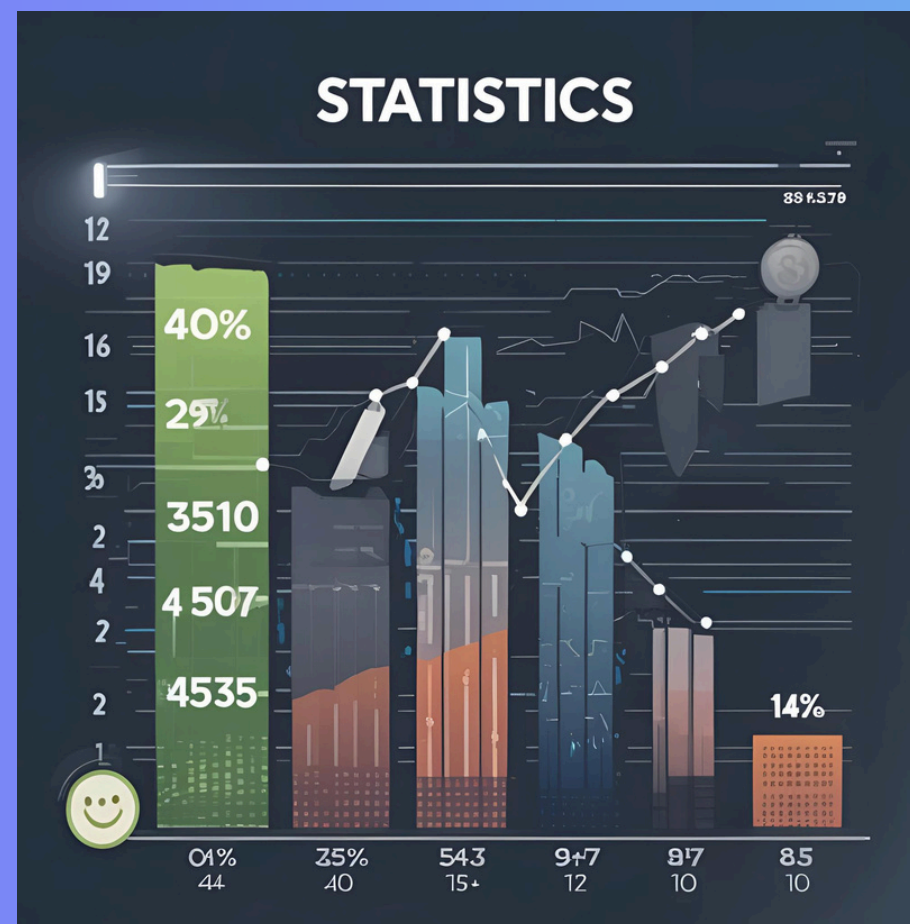
By Amos obaga ©

1. Introduction

- **Hook: "Thousands of accidents. Limited visibility into the real causes."**
- **Goal: Use data to uncover actionable aviation safety insights**
- **Tools: Python(EDA), Tableau (Dashboard)**

2. Business Context

- **Problem: Current decisions are reactive and based on incomplete reports**
- **Impact: Better decisions → save lives, reduce costs, and improve efficiency**
- **Identifying patterns that predict and prevent similar events in the future.**

3. The Data

This data set was extracted from the National Transportation Safety Board that includes aviation accident data from 1962 to 2023 about civil aviation accidents and selected incidents in the United States and international waters.
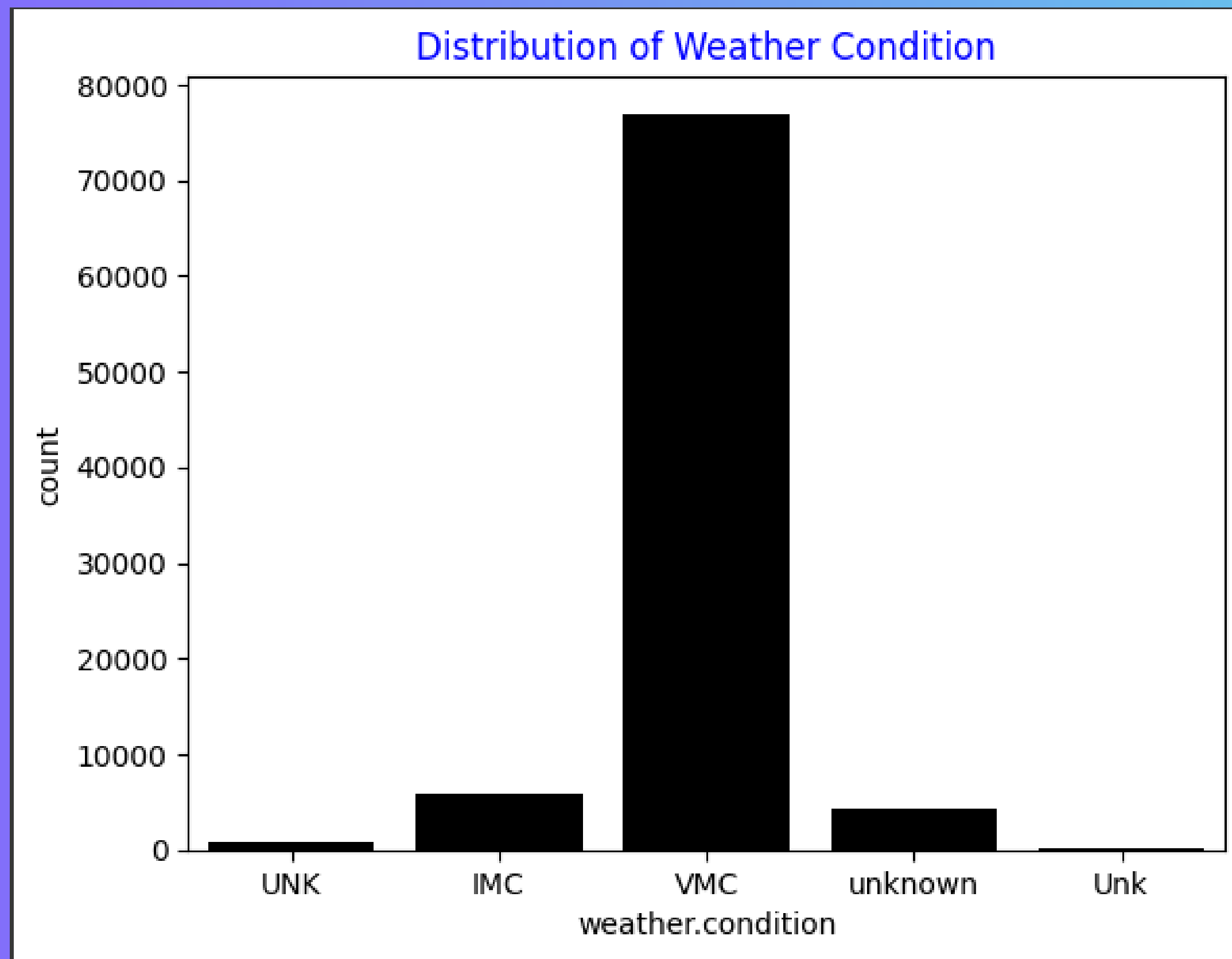
4. Process Steps

- **Data Cleaning: Filled NaNs, removed outliers**
- **Feature Engineering**
- **Analysis: Descriptive, univariate, bivariate (no heavy modeling)**
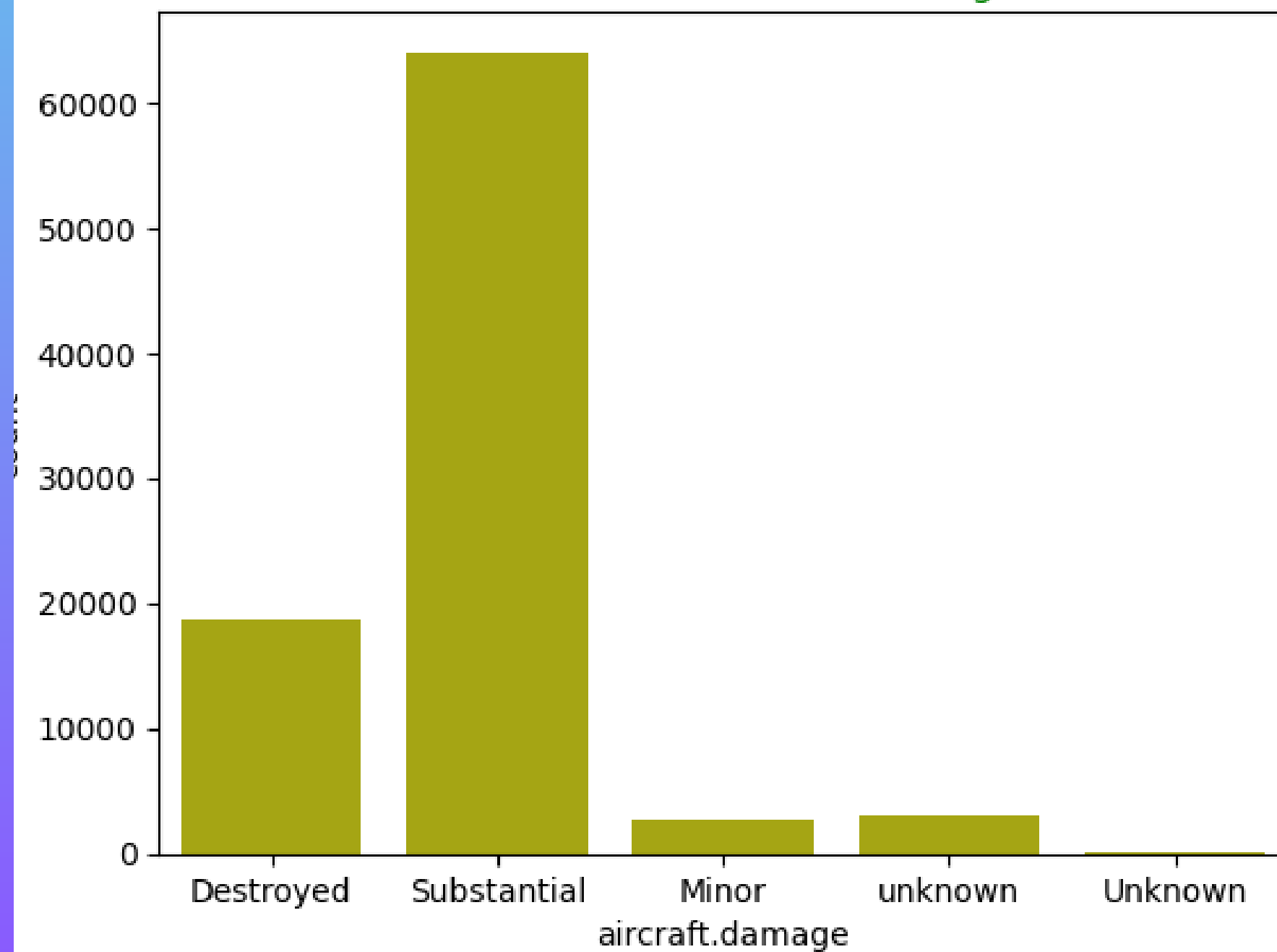- **Visualization: Built Tableau dashboard, python**
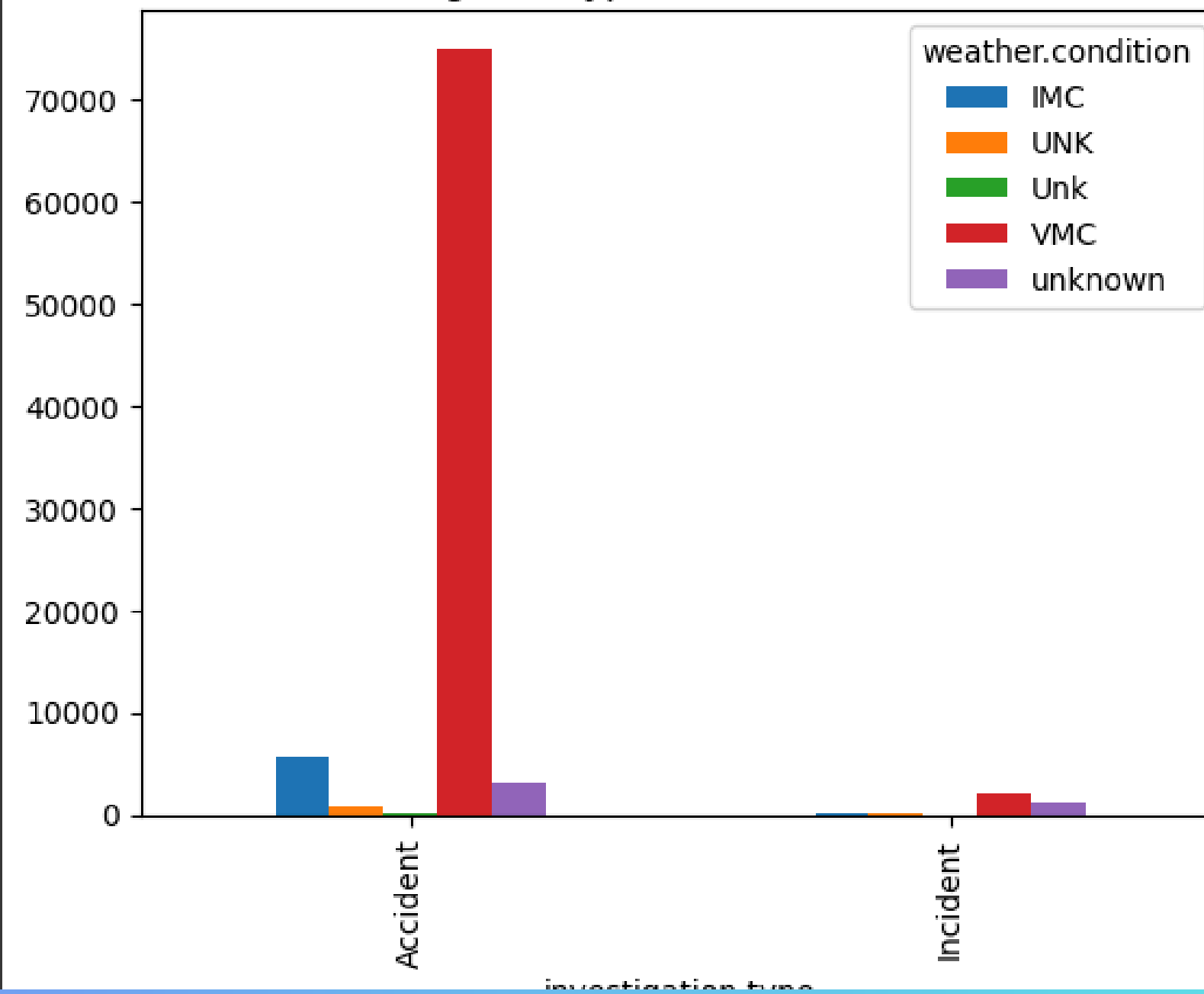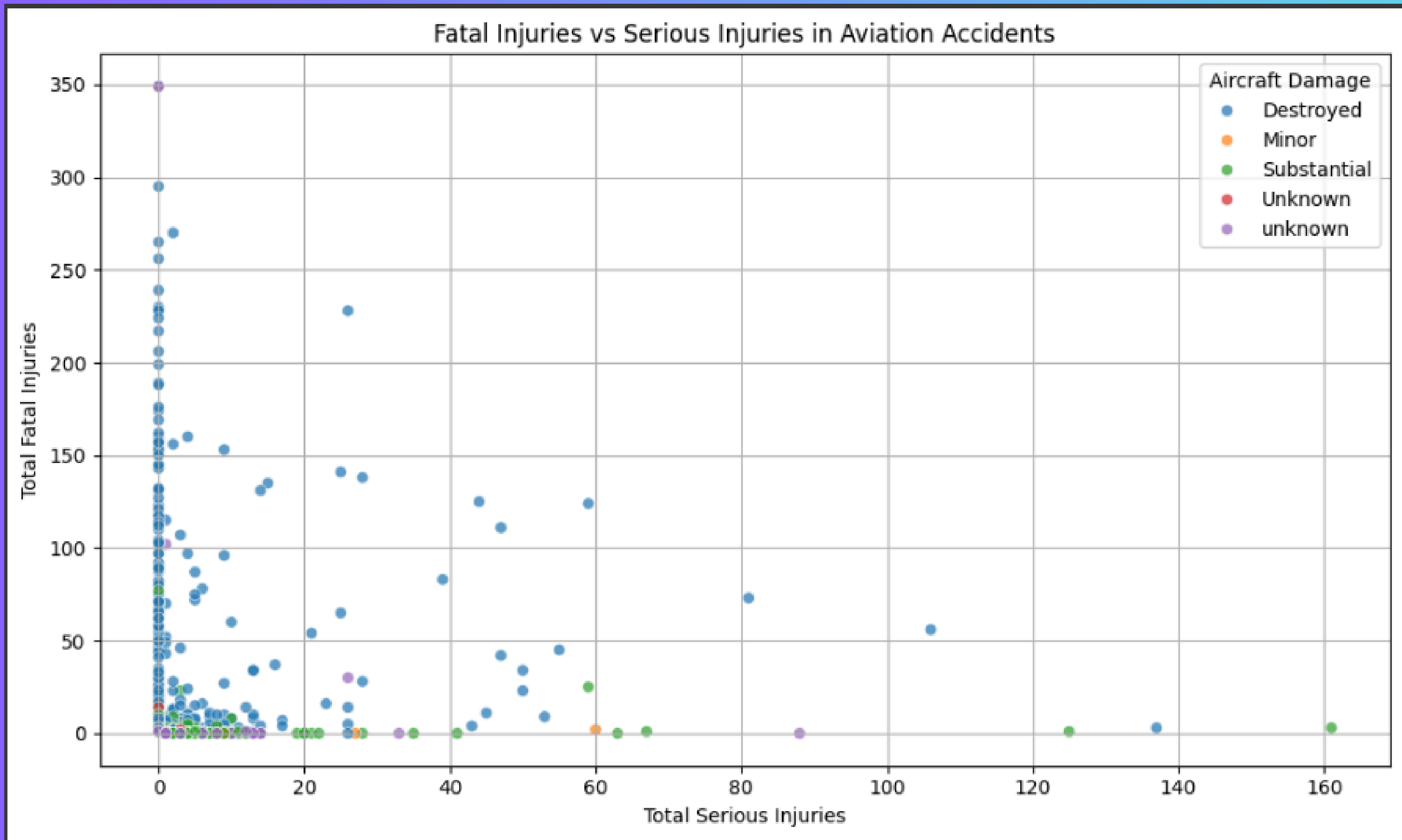
5. Results & Recommendations

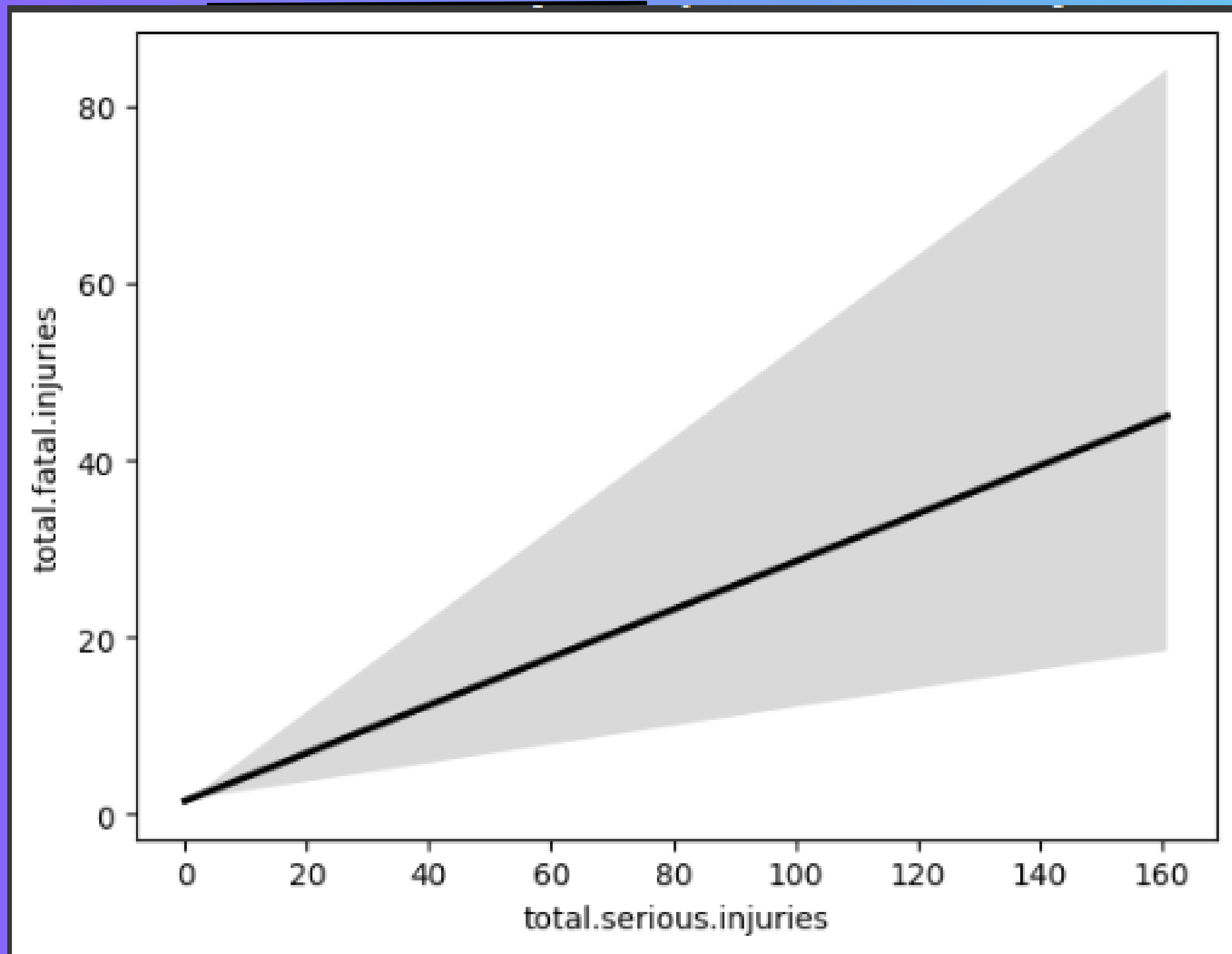Distribution of Weather Condition

EDA
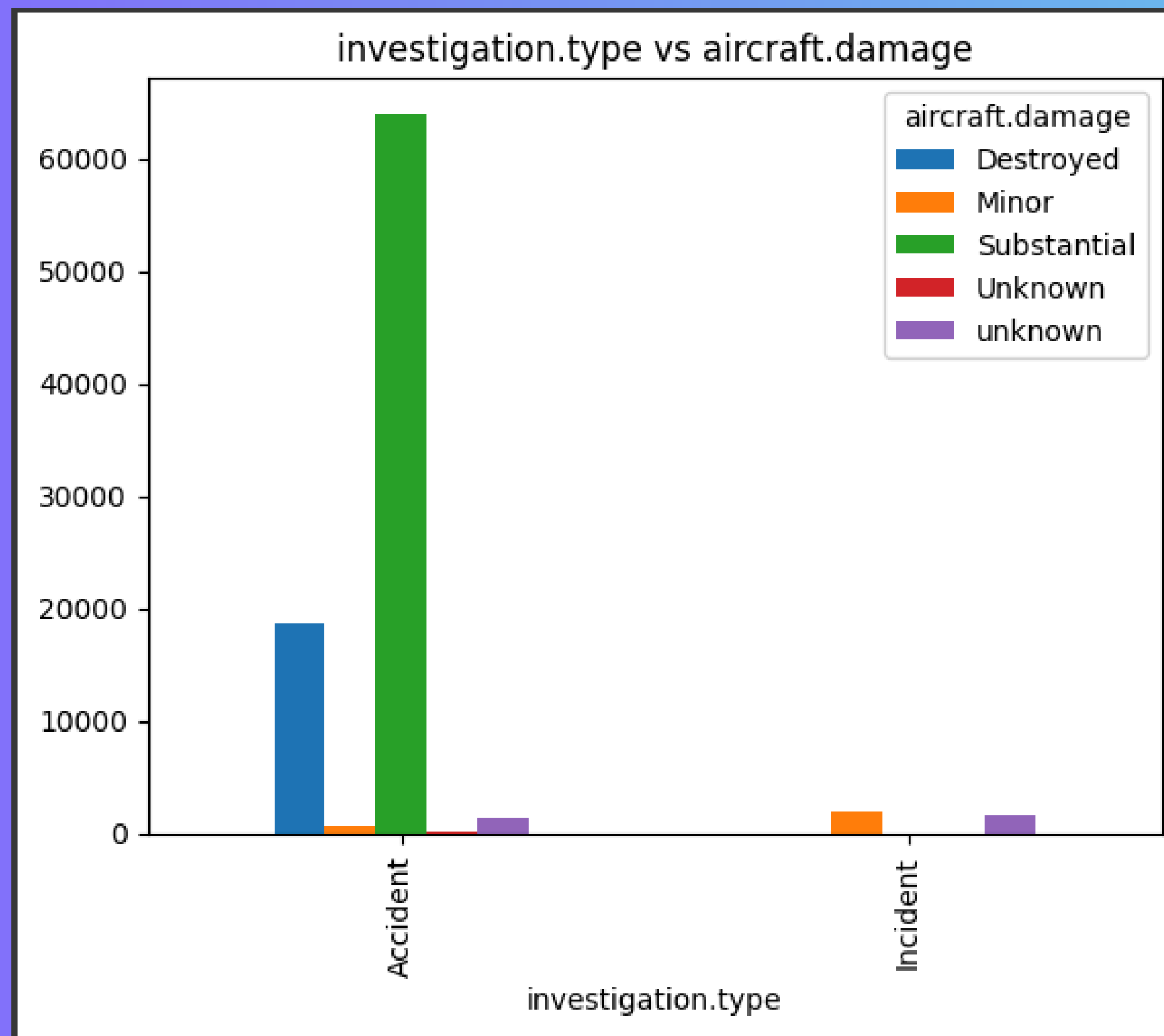
Scatter plot

Trend line

EDA

6. Key Insights:

Substantial Damage is the Most Common Damage Type

Insight:

Most accidents result in substantial, not destroyed aircraft — indicating survivable crashes with repair costs.

Business Impact:

- Maintenance and insurance planning should emphasize substantial damage frequency.
- Could inform procurement and parts stocking strategies.

High impactfull insights

*Certain Regions Have Consistently Higher Incidents
Insight:
*Many accidents in countries like USA, Canada and Brazil

*High Number of Uninjured Passengers in Many Incidents

Insight:

*In many incidents, no injuries are reported despite aircraft damage.

Interpretation:

- Suggests good safety procedures or aircraft design.
- Track aircraft types with high survival rates to inform fleet decisions.

7. Evaluation $ future improvement

Limitations: Some Null values imputed

Confidence: Medium-high due to preprocessing + EDA strength

Future Work:

- Add flight-level & pilot data
- Build predictive risk scoring
- Deploy dashboard internally for live use

THE END