AVIATION RISK ASSESSMENT PROJECT

Project Overview

Focus:

Comprehensive analysis of aviation incident data to identify low-risk aircraft models.

Key Insights:

Analyze factors such as technical failures, human errors, and environmental conditions.

Provide actionable insights for risk mitigation.

Business Overview & Challenge

Goal:

Expand into aviation with a focus on aircraft safety.

Challenge:

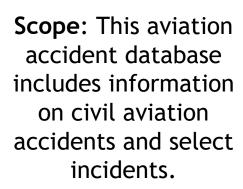Lack of insight into safety risks could lead to acquiring unsafe aircraft.

Strategic Need:

Identifying low-risk aircraft models is critical for making informed purchasing decisions and mitigating operational risks.
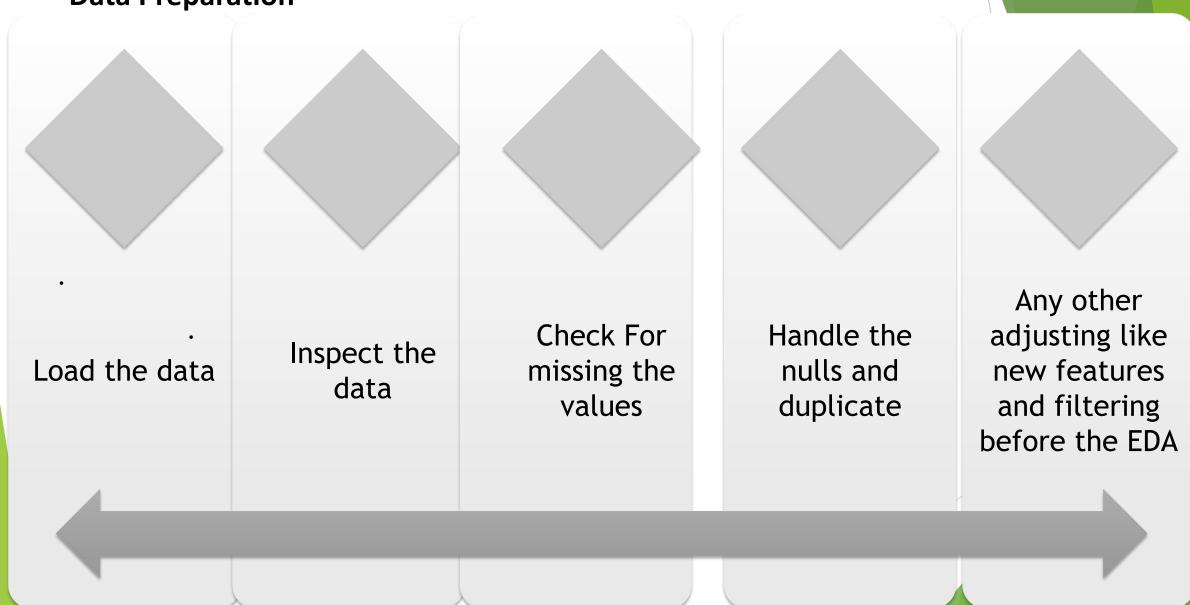
Data Understanding

Source: The dataset is sourced from Kaggle, obtained from the National Transportation Safety Board (NTSB).

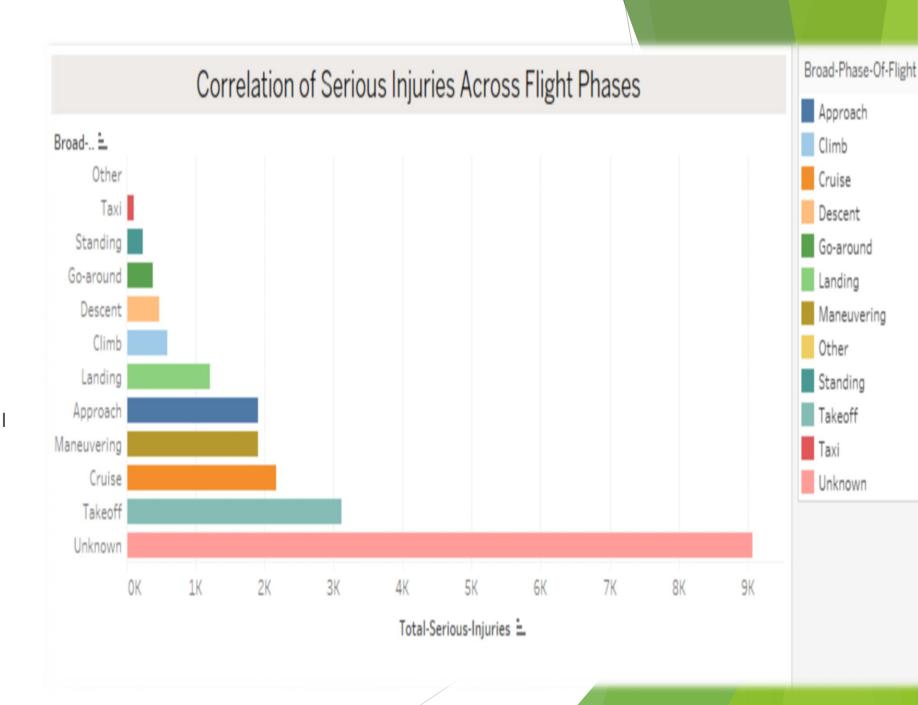**Time Frame**: The data covers incidents from **1962 to 2023**.

Scope: This aviation accident database includes information on civil aviation accidents and select incidents.

Geographical Coverage: Encompasses the **United States**, its territories, and **international waters**.

Data Preparation

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· Load the data

Inspect the data

Check For missing the values

Handle the nulls and duplicate

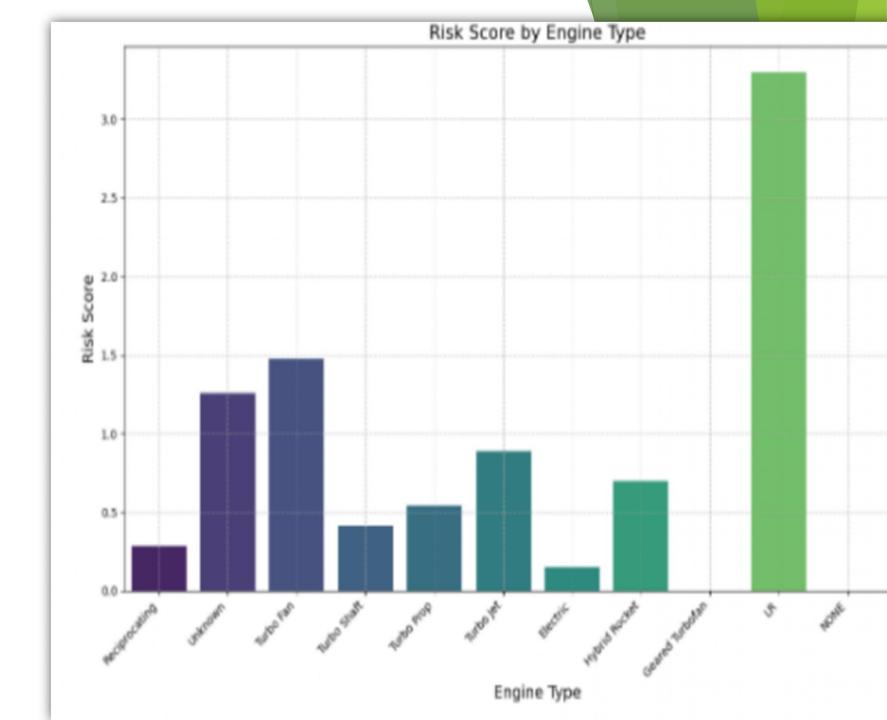Any other adjusting like new features and filtering before the EDA

High-Risk Phases:

- Takeoff
- Maneuvering
- Approach
- Landing
- **Recommendations**:
  - Strengthen safety protocols.
  - Enhance pilot training for critical phases.
- Goal: Minimize risks post-acquisition.

Correlation of Serious Injuries Across Flight Phases

Focus on Aircraft with Reciprocating Engines
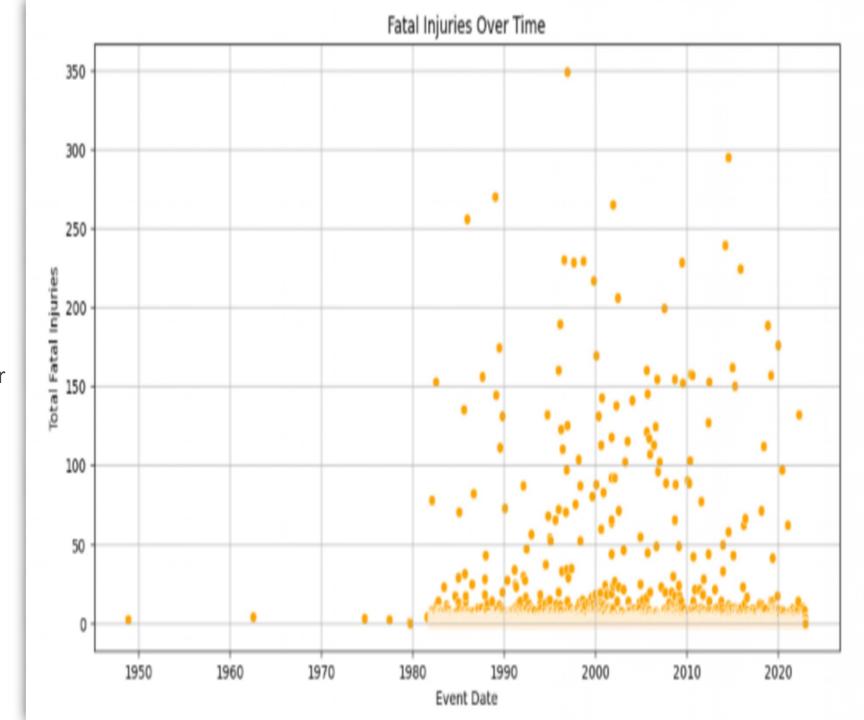
- Top Engines that poses lowest risks is Reciprocating
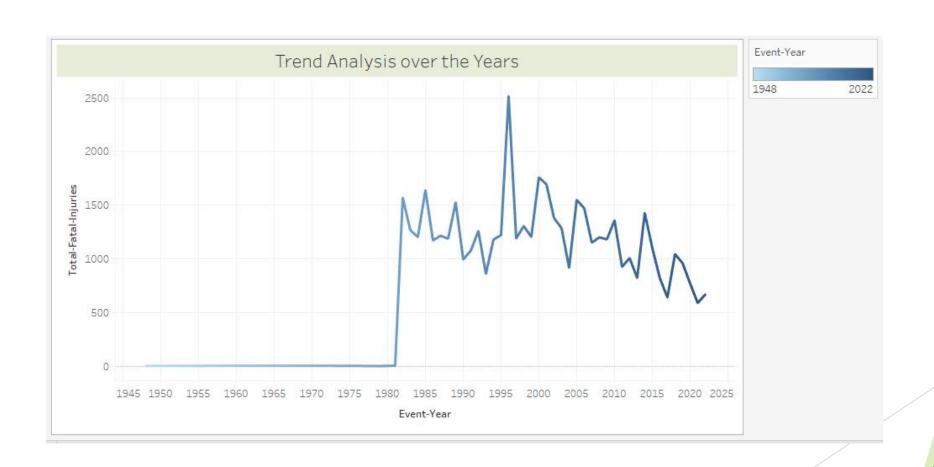
- There a lot of missing information indicated by unknown

Trend Analysis Over Time

Focus on Safety:

✓ Most incidents have low fatalities, but high-fatality events highlight ongoing safety needs.

✓ Spikes in the 2000s may indicate higher risk periods, likely due to changes in technology or regulations.

Fatal Injuries Over Time

More on Trend Analysis

Comparison Analysis on Weather and Injury Rate

Pilot Vigilance in Good Weather:

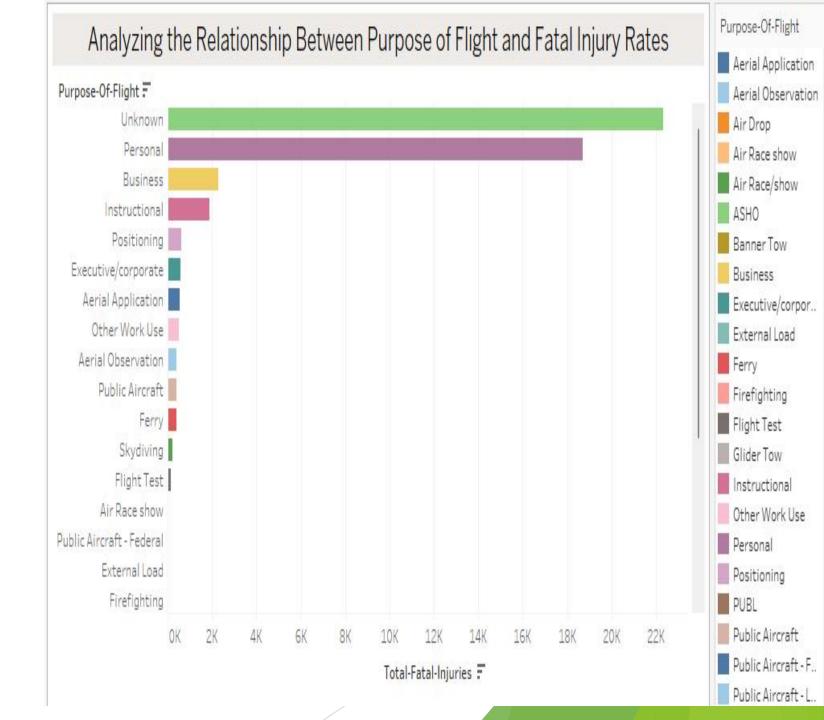❖ Most accidents occur in Visual Meteorological Conditions (VMC), suggesting potential pilot complacency.

Proposed Solution:

❖ Enhance pilot training to maintain vigilance and strict adherence to safety protocols, even in ideal weather.

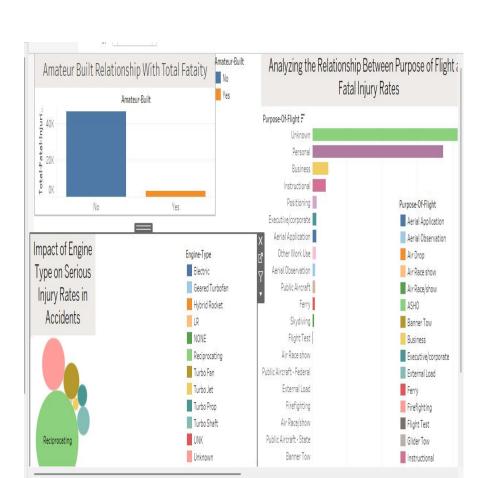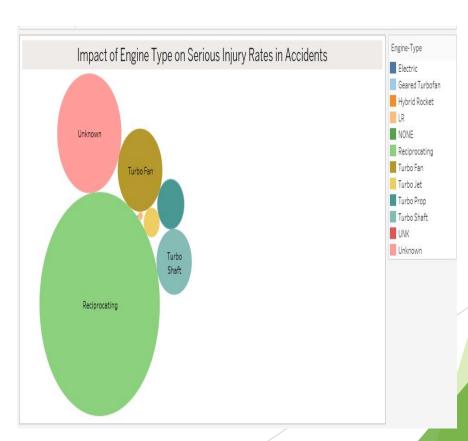Influence of Weather Conditions on Fatal and Serious Injury Rates

Rate of Injury Based on Purpose of the Flight

➤ There was significant amount data missing as indicated by the unknown, despite that personal seemed to have the highest risk

Analyzing the Relationship Between Purpose of Flight and Fatal Injury Rates

Impact Of   Engine On Serious and Fatal Injury

EXPLORATOTY DATA ANALYSIS

Recommendation:

❖ Prioritize these makes and models for fleet expansion based on their strong safety data.

Top 10 Make and Model by Risk Rate