Aviation Accident Risk Analysis (1962–2023)

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Project Overview

Context:
Our company is entering aviation and needs to reduce operational risk when acquiring aircraft.

Goal:
Identify low-risk aircraft types using historical accident data.

Data:
NTSB dataset of 80,000+ records from 1962–2023.

Stakeholder:
Head of Aviation Division – responsible for aircraft acquisition decisions

The Dataset

Features Used:

- Aircraft Make & Model
- Flight Phase
- Injury Severity
- Weather Condition
- Flight Purpose

Source

- National Transportation Safety Board (NTSB)

Insight:

Dataset offers deep historical coverage of accidents with critical aircraft and flight details for safety analysis.

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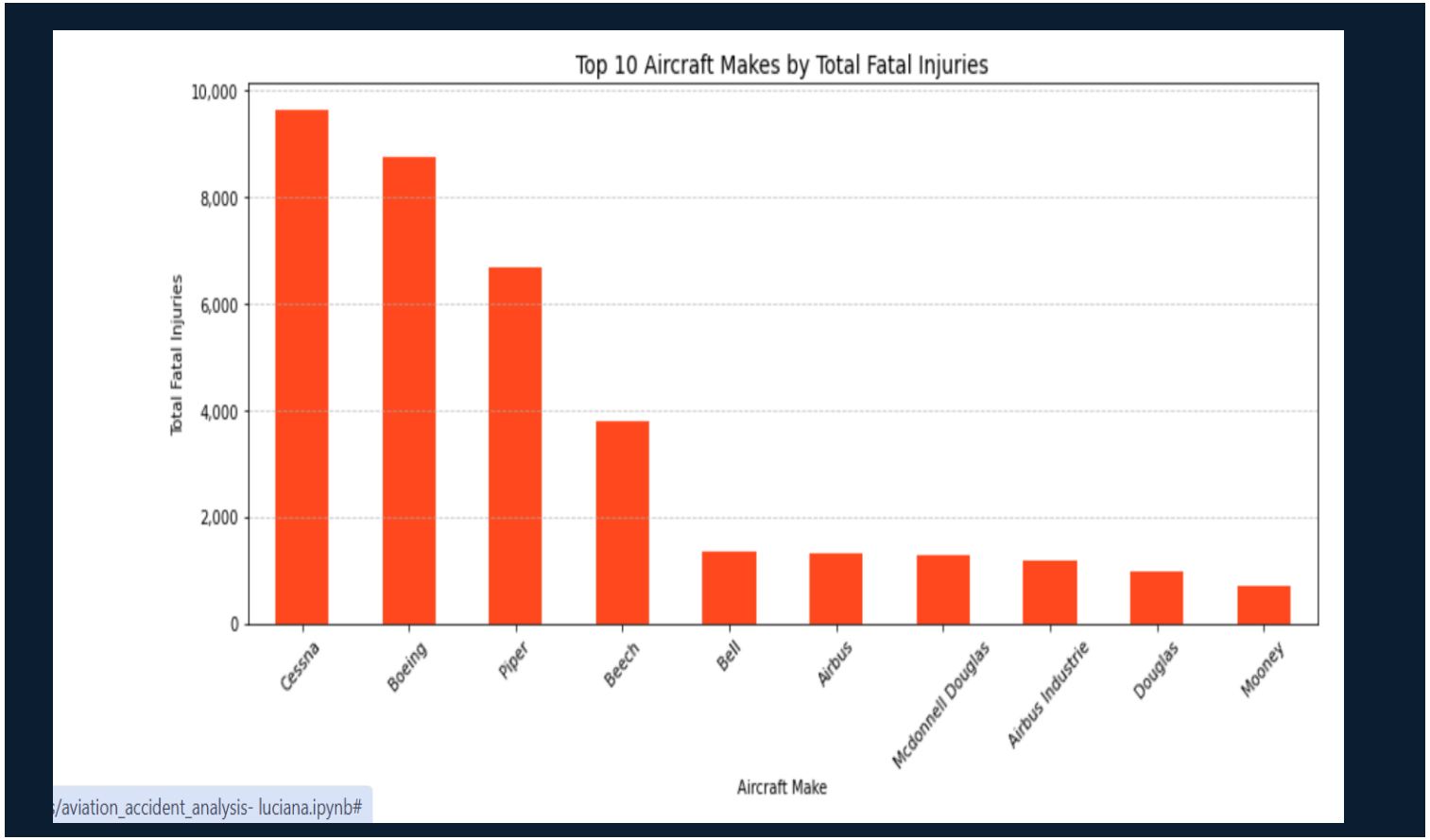
Risk by Aircraft Make

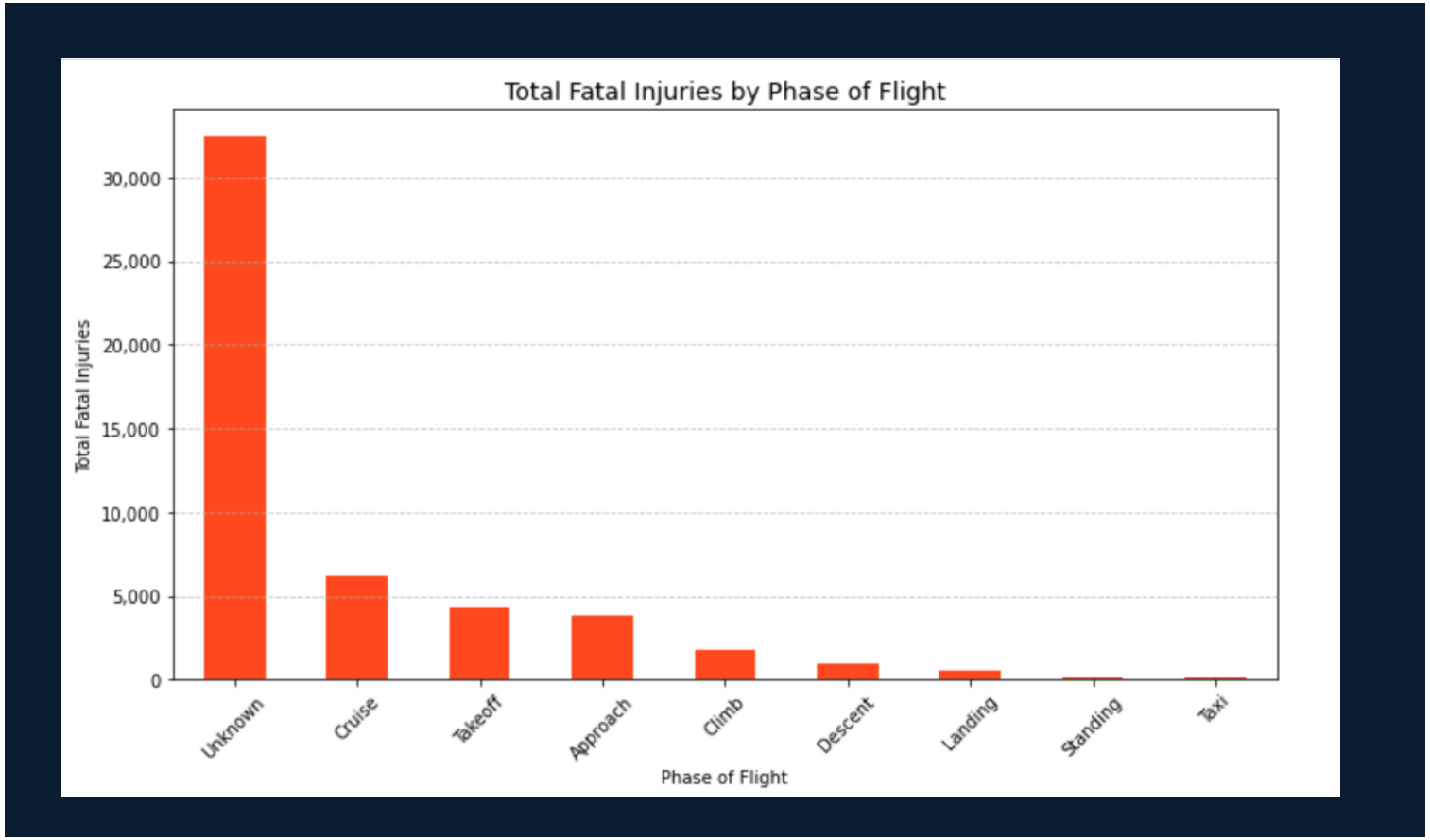


Insight:

Aircraft makes like **Boeing and Cessna** had the **highest total fatal injuries**. This may reflect volume but warrants **further review** before acquisition.

Action:
Use these insights to flag high-risk aircraft types during due diligence.

Risk by Phase of Flight

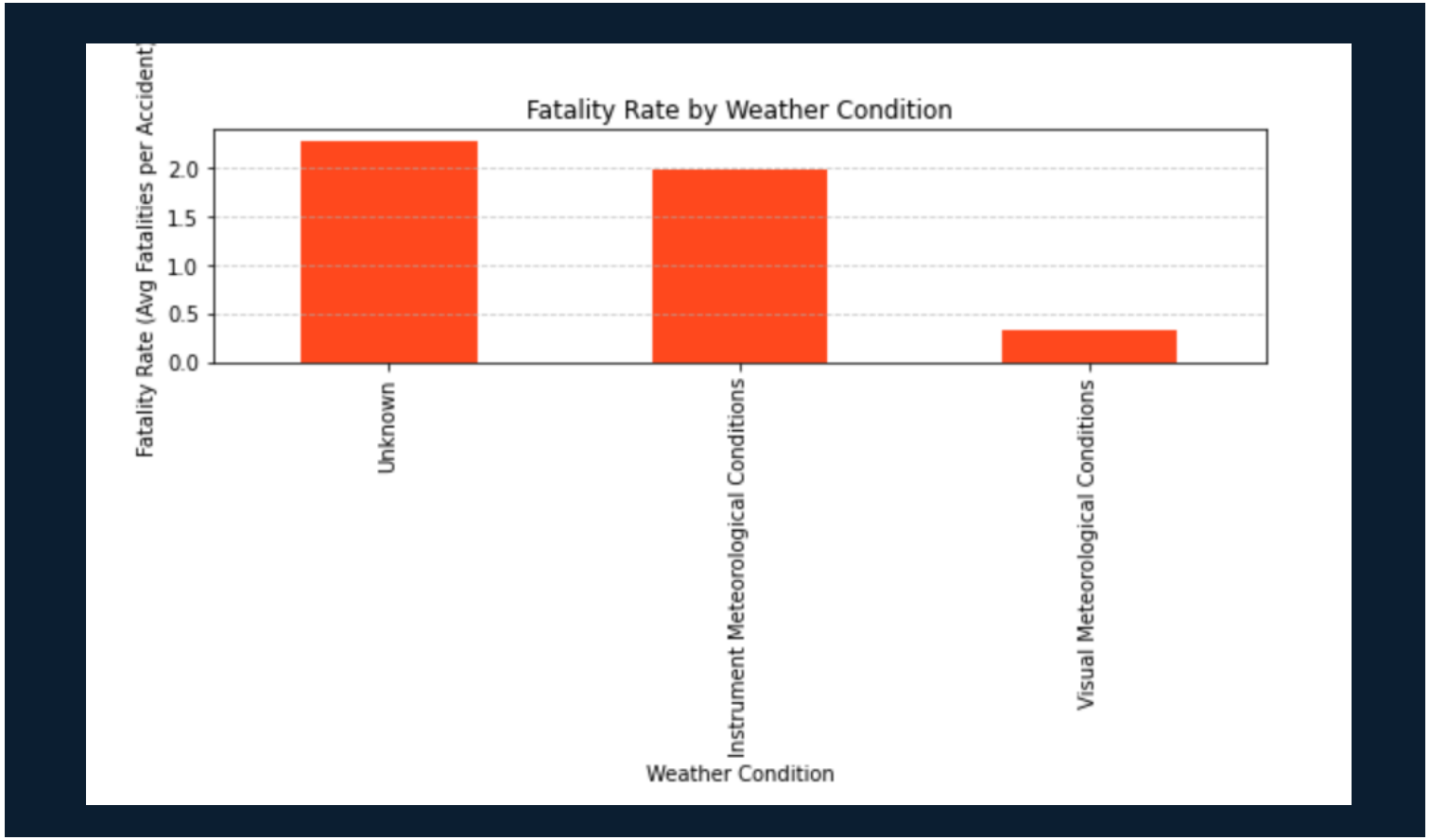


Insight:

Approach and Landing are the most dangerous phases accounting for the **highest fatality rates**.

Action:
Focus safety investments and training efforts on these critical phases.

Weather & Purpose of Flight

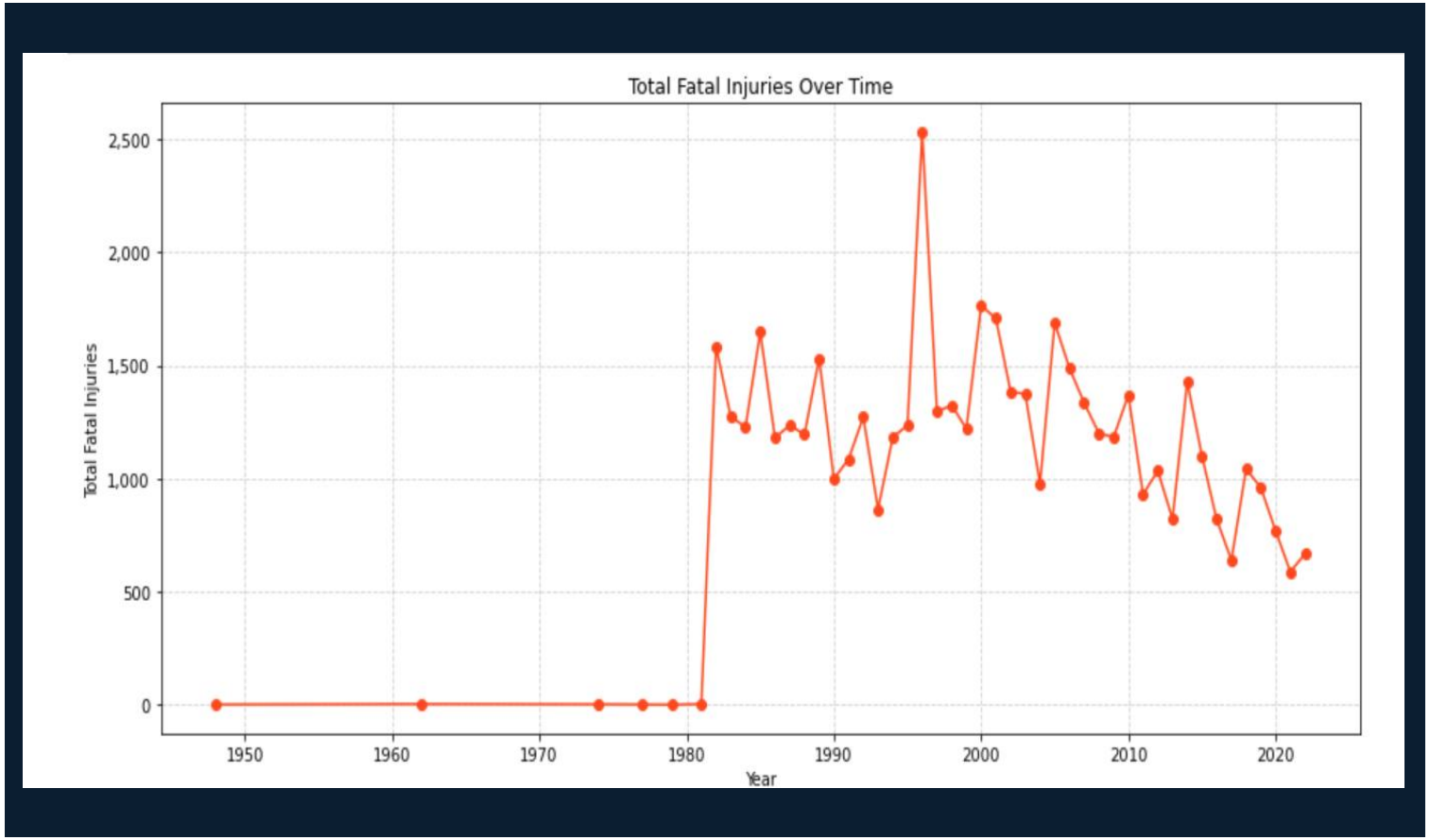


Insight

Flights in **IMC (poor weather)** are more deadly than those in clear conditions. **Personal flights** show higher average fatalities per accident than commercial or training.

Action:
Avoid operating in poor weather unless fully certified. Focus on **commercial/training flights** in early operations.

Safety Trends Over Time



Insight:

Fatalities **peaked in the 1980s–1990s** but have since **declined steadily**, showing progress in aircraft safety and tech.

Action:

Modern aircraft designs offer safer investment opportunities today.

1 **Recommendation**

1. Avoid high-fatality aircraft makes unless strongly justified.
2. Invest in safety training for approach and landing.
3. Limit flights in poor weather unless certified.
4. Focus on safer use cases like commercial or instructional flights.

2 **Insight:**
These recommendations reduce operational risk, ensure safer early operations, and build stakeholder confidence.

Thank You!

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