Flying Smart: Identifying the Safest Aircraft for Investment

Navigating the complexities of aviation requires meticulous risk assessment. This analysis provides a data-driven approach to identify low-risk aircraft, ensuring a secure and strategic market entry.

Data-driven risk analysis of aviation accidents

Introduction:

We analyzed decades of aviation accident data to identify low-risk aircraft for our company's upcoming aviation investment.

Our mission: find the safest aircraft types and conditions to support sound, data-backed investment decisions.

Business Context

Our company is expanding into aviation but lacks knowledge on accident trends, high-risk aircraft, and safe flying conditions.

We need insights that reduce risk, maximize safety, and support confident investment decisions

Our Data Journey: From Raw to Refined Insights

Raw Data Acquisition

We used the U.S. aviation accident reports which has over 60,000+ records from 1948 - 2007

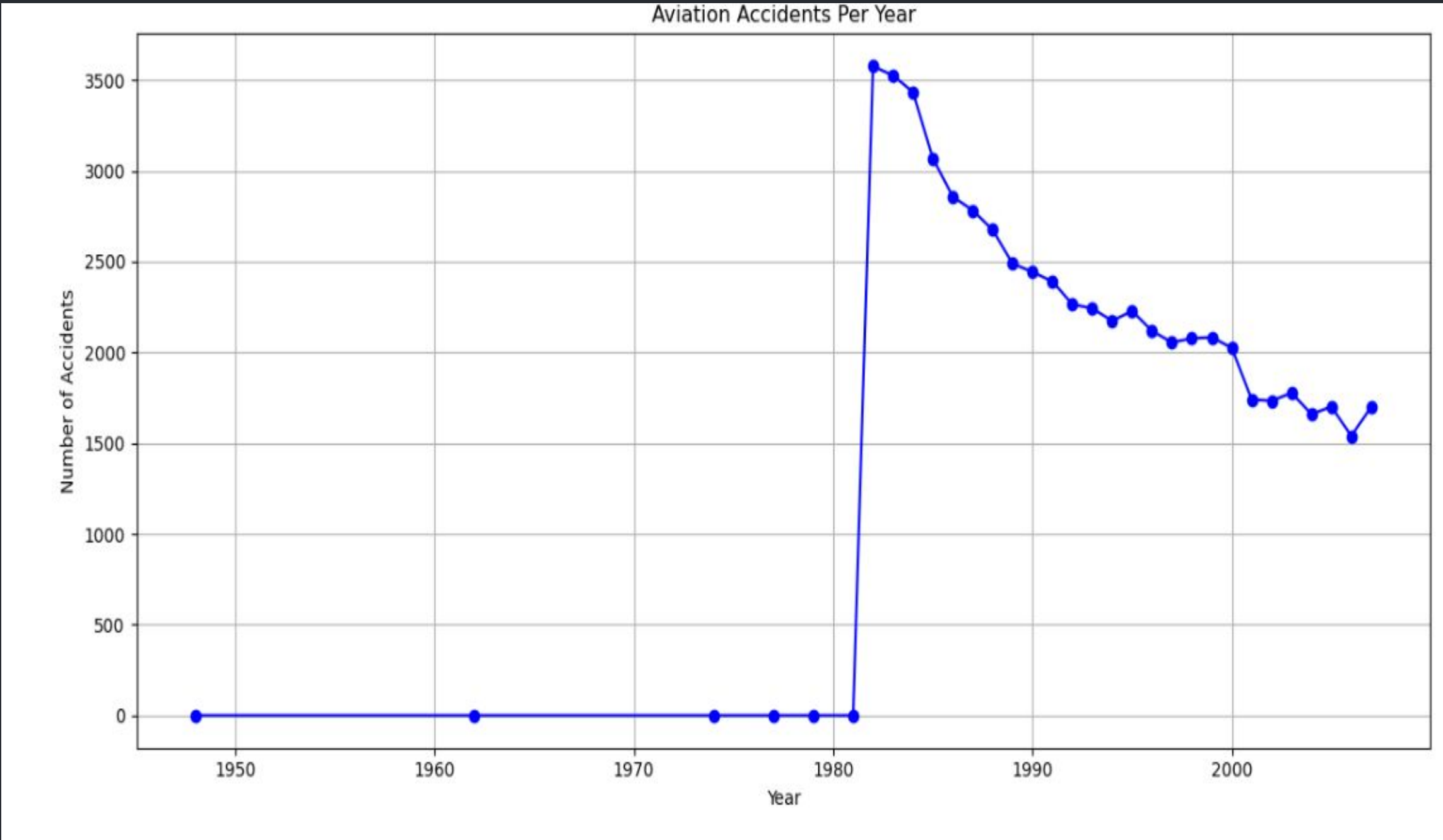### Data Cleaning & Validation

I was able to maintain the key fields e.g. aircraft make, injury types, purpose of flight, weather, flight phase, etc

Feature Engineering

From my analysis I was able to make conclusions and recommendations that you will find valuable

Accidents Over Time: Assessing Current Risk Landscape


Aviation Accidents Per Year

From this it is evident that the number of accidents in the aviation sector have a downward trend thus it is advisable to enter the aviation sector

The Top 10 Aircraft makes With the Most Number of Accidents

Top 10 Aircraft Makes by Number of Accidents
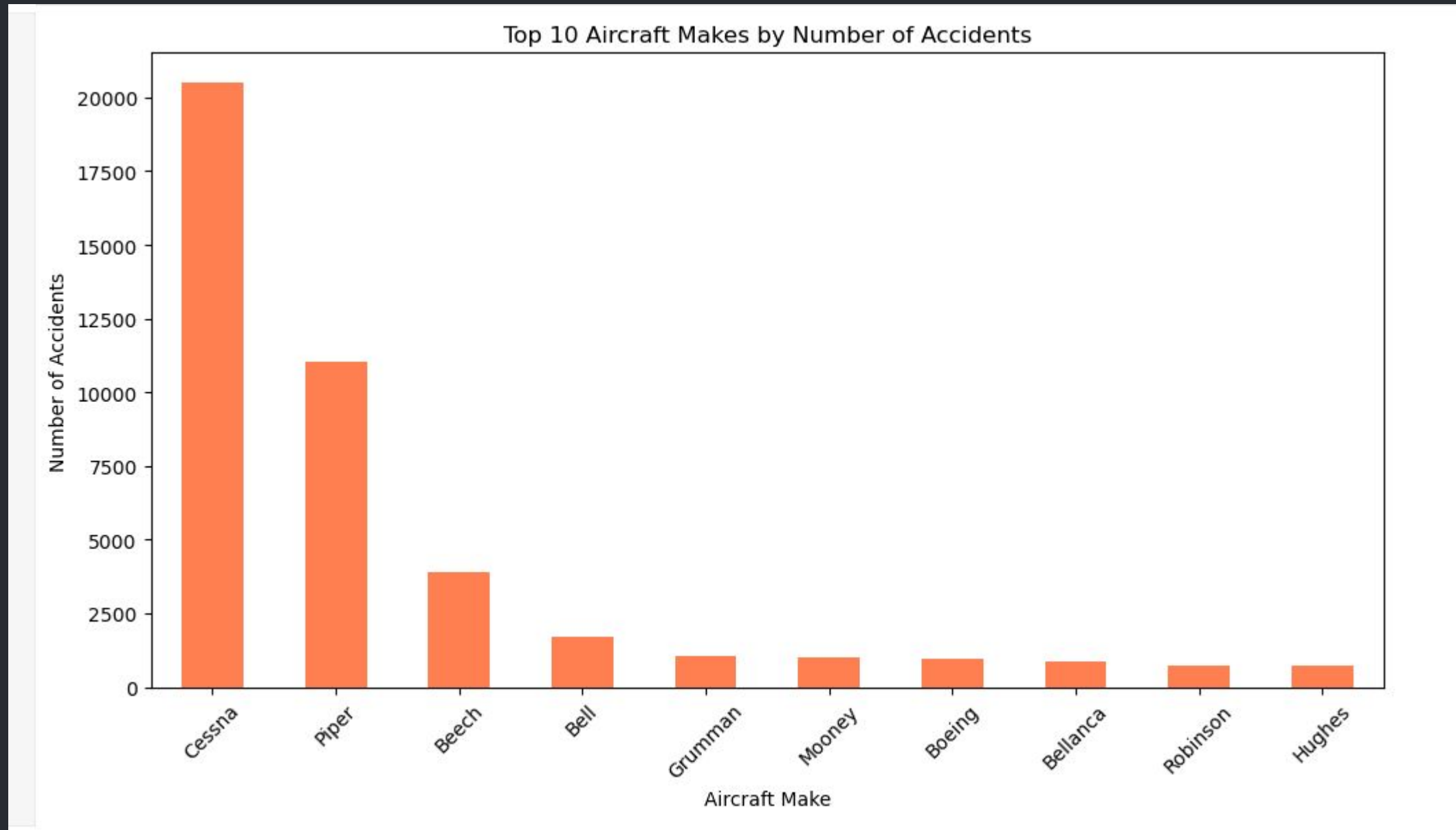
We can see that the Cessna and the Piper have accounted to a very huge number of accidents compared to other aircrafts.

Flight Phases With The Most Number of Accidents

Number of Accidents by Phase of Flight
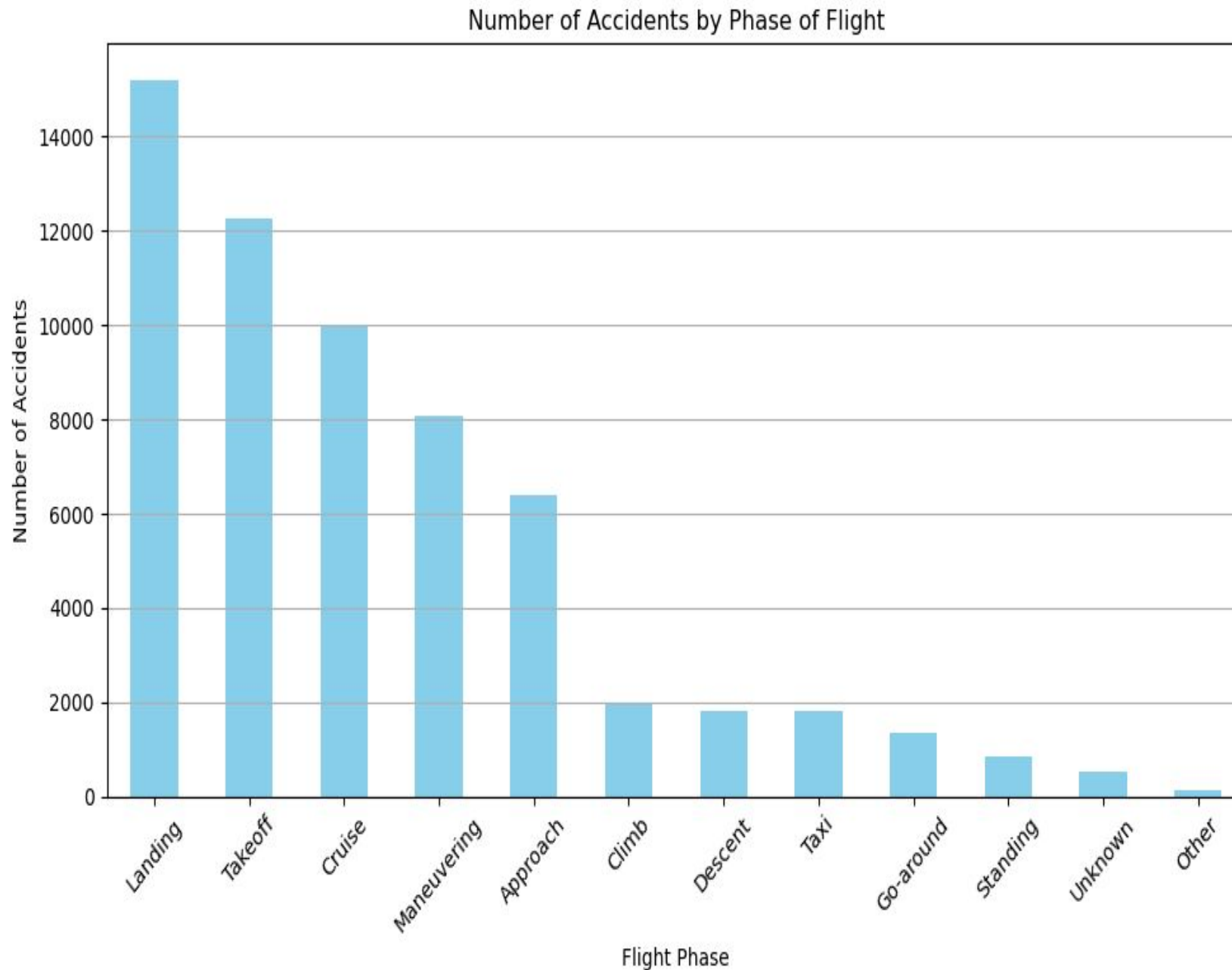
From this it is very evident that majority of the accidents take place during
- Landing 15,213
- Takeoff 12,258
- Cruise 10,007

Recommendations

1. Prioritize Executive/Corporate and Aerial Observation Aircraft for Initial Investment

Why:

- These aircraft types showed **the lowest number of injuries and accidents** in your dataset.

- Executive/Corporate flights are typically flown by experienced pilots, under well-regulated conditions.

- Aerial Observation flights (e.g., for mapping or inspection) also showed **very low risk profiles**.

Business impact:
 Starting with these aircraft types minimizes initial risk exposure and builds operational confidence.

Invest in Training and Safety Protocols for Critical Flight Phases

Why:

- Most injuries happen during **landing, takeoff, and maneuvering**.

- Even in **clear weather (VMC)**, accidents are common — meaning human error is likely a bigger factor than visibility alone.

Business impact:
 By reinforcing pilot training, equipment checks, and operational standards during these phases, the company can reduce risk regardless of aircraft make or weather.

Recommended Aircraft Make: Beechcraft

Why Beechcraft?

1. Proven Safety Record
 Your analysis shows that Beechcraft aircraft:

- Have a **relatively low number of fatal injuries** compared to other makes.

- Are **commonly used in less risky flight operations**, such as executive travel, private charter, and instructional flights.

2. Ideal for Entry-Level Aviation Operations

- Beechcraft models (like the **King Air** series) are **twin-engine turboprops**, well-suited for **short to medium-range missions**.

- They offer **high reliability**, strong manufacturer support, and a lower operational cost than jets.

3. Versatile and Scalable

- Beechcraft aircraft can serve both **private and small-scale commercial markets**.

- They are frequently used for **executive transport, air ambulance, cargo, and training**, which fits well into a diversified aviation strategy.

Thank You!!