**Final Report: Airplane Crash and Fatalities in India**

**1. Introduction**

This report explores airplane crashes and fatalities in India, using a comprehensive dataset analyzed via Power BI. The aim is to determine the root causes, frequency patterns, and trends in crash incidents. Key features examined include crash types (e.g., pilot error, ATC error, hijack, mid-air collision), aircraft manufacturers, engine types, manufacturing years, weather conditions, and geographic locations. The goal is to provide insights and data-driven recommendations to reduce future incidents.

**2. Descriptive Analysis**

* Fatalities Over Time: The data shows fluctuations in the number of fatalities from 1940 to 2025, with several peaks during the late 20th century.
* Top Crash Locations: Cities like Ahmedabad, Amritsar, Bombay, and Uttar Pradesh report higher crash frequencies.
* Manufacturer Involvement: Boeing has the highest percentage of crashes among aircraft manufacturers, followed by Airbus and Pratt & Whitney.
* Passenger Load Impact: Higher passenger counts generally correlated with increased fatalities.
* Crash Types: Common crash types include Pilot Error, Loss of Control, and Mid-air Collisions.

**3. Diagnostic Analysis**

* Crash Type vs. Survivors/Fatalities: Pilot Error and Loss of Control accounted for most fatalities.
* Weather Conditions: Clear and partly cloudy conditions had the most crashes, likely due to the volume of flights in these conditions rather than weather severity.
* Year of Build: Older aircraft (built before 2000) show higher crash rates, indicating aging fleets may be more vulnerable.
* Engine Types: Some engine models like JT8D and CFM56 variants are linked to aircraft with crash incidents, warranting closer inspection.

**4. Predictive Analysis**

* Crash Frequency by Engine Type and Year: Engine and manufacturing year data help identify risk trends for certain aircraft-engine combinations.
* Flight Distance vs. Crash: Most incidents occurred within a flight distance of 0–150 km, pointing toward issues during takeoff and early flight stages.

**5. Prescriptive Analysis**

Based on analytical findings, the following improvements are suggested:

✈️ Modernization of Fleet

* Phase out aircraft older than 20 years to reduce the risk associated with outdated systems.

🧑‍✈️ Enhanced Pilot Training

* Implement rigorous simulator-based training focusing on takeoff, landing, and emergency handling.

🌦️ Weather Protocol Enhancements

* Introduce stricter go/no-go criteria for flights under marginal weather conditions.
* Deploy advanced meteorological tools for predictive weather alerts.

🛫 Safety and Compliance Audits

* Conduct frequent audits of high-risk regions (e.g., dense metro areas and mountainous terrain).
* Review and upgrade airport infrastructure and ground control systems.

🔍 Data-Driven Policy Making

* Use analytics to continuously assess aircraft performance, pilot conduct, and mechanical reliability.
* Establish a centralized digital incident reporting and tracking system