Love-Reen / DSC-PHASE-ONE-PROJECT

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.ipynb_checkpoints	Initial commit: Added all files	2 days ago
images	Update chart link	yesterday
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README.md	Update README.md	7 minutes ago
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README

Aviation Risk Assessment Project

Overview

This project dives deep into aviation incident data to help a company venturing into the airline industry identify the lowest-risk aircraft to invest in. Through structured data cleaning, analysis, and visualization, this notebook translates raw data into business intelligence tailored for high-stakes decision-making.

Business Understanding

Scenario:
Your company is exploring new business verticals and is considering investing in aviation for commercial and private purposes. However, the risk factors associated with different aircraft types remain unknown. As a data analyst, your mission is to identify which aircraft categories and conditions result in the least severe outcomes in incidents.

Stakeholder:
Head of the new aviation division, who will use this data-driven insight to inform strategic procurement decisions.

Key Questions:

- Which aircraft categories are linked to higher injury severity?
- Does weather condition impact the severity of incidents?
- Which flight purposes tend to be riskier?
- How have incidents trended over time?

Data Understanding and Analysis

Data Source:
U.S. National Transportation Safety Board (NTSB) aviation incident records (CSV/XLSX format).

Key Columns:

- `Event_Date`, `Location`, `Aircraft_Category`, `Injury_Severity`, `Weather_Condition`, `Purpose_of_flight`, etc.

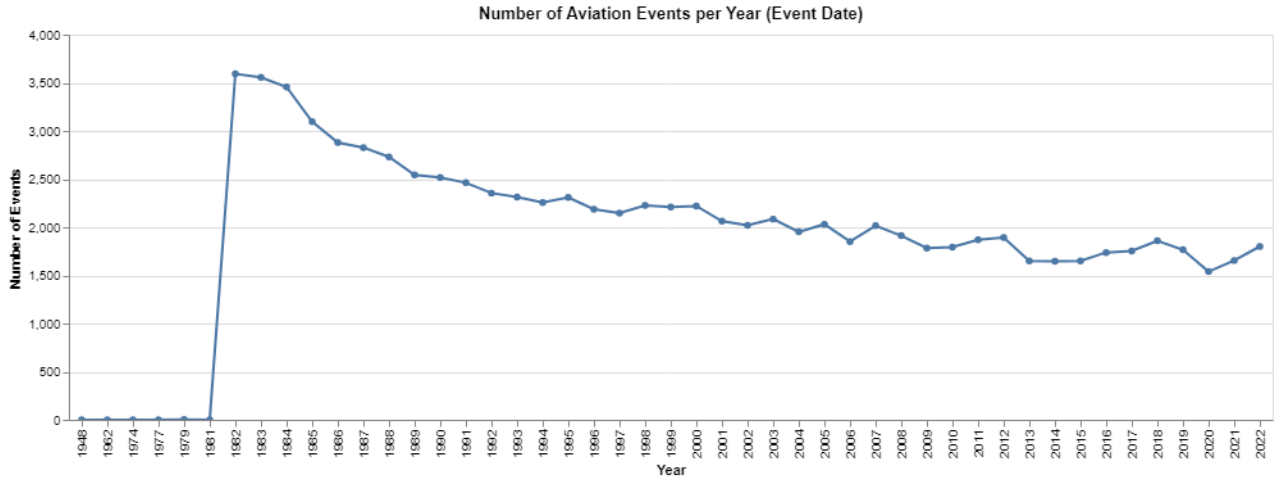
Cleaning Steps:

- Filled missing numerical and categorical data.
- Dropped columns with over 80% missing data.
- Removed illegal characters that could corrupt Excel output.
- Added derived fields such as `Year` and `Injury_Severity_Categorized`.

Key Visualizations

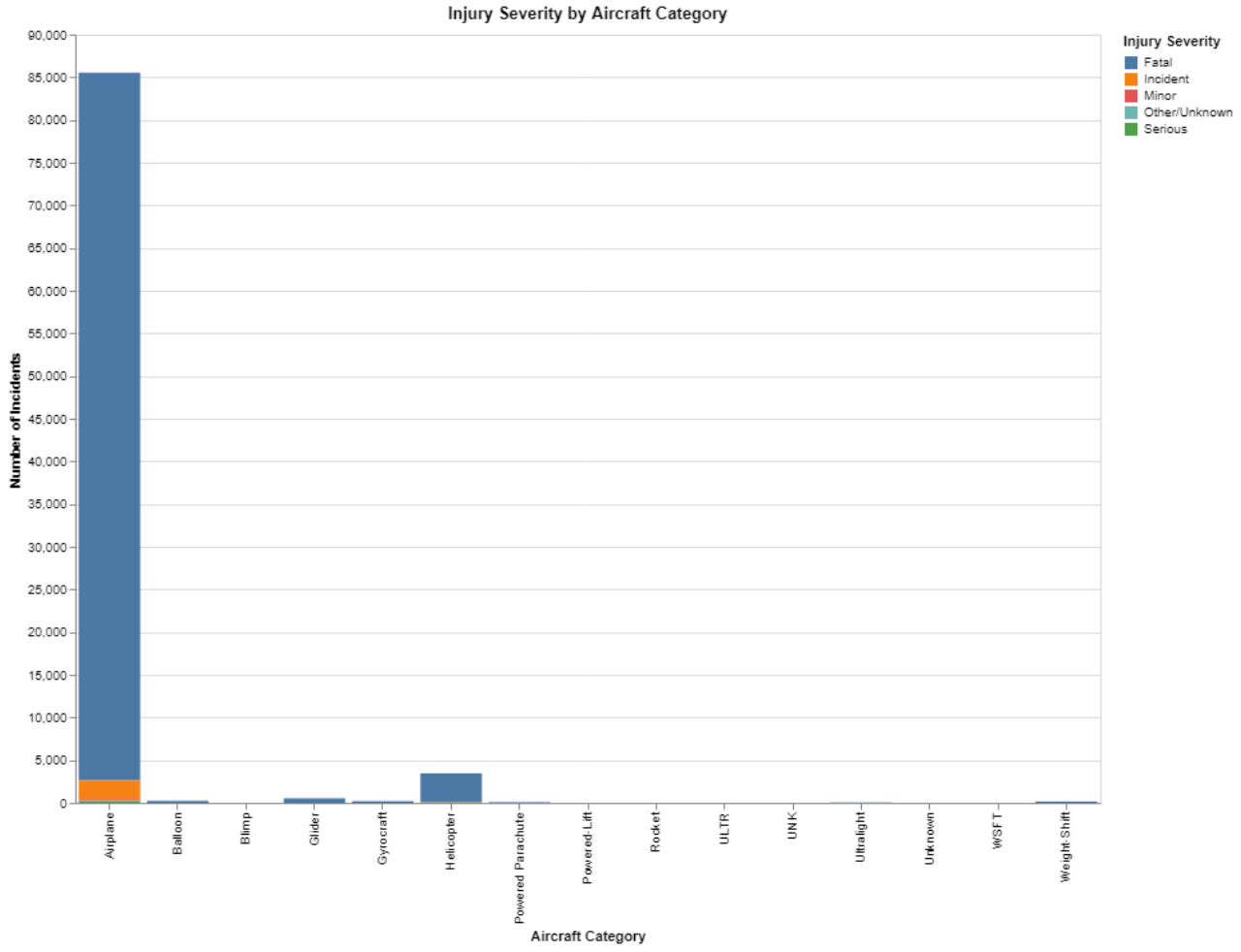
1. Events Per Year

This line chart shows the trend of aviation events over the years, highlighting spikes or dips in incident frequency.



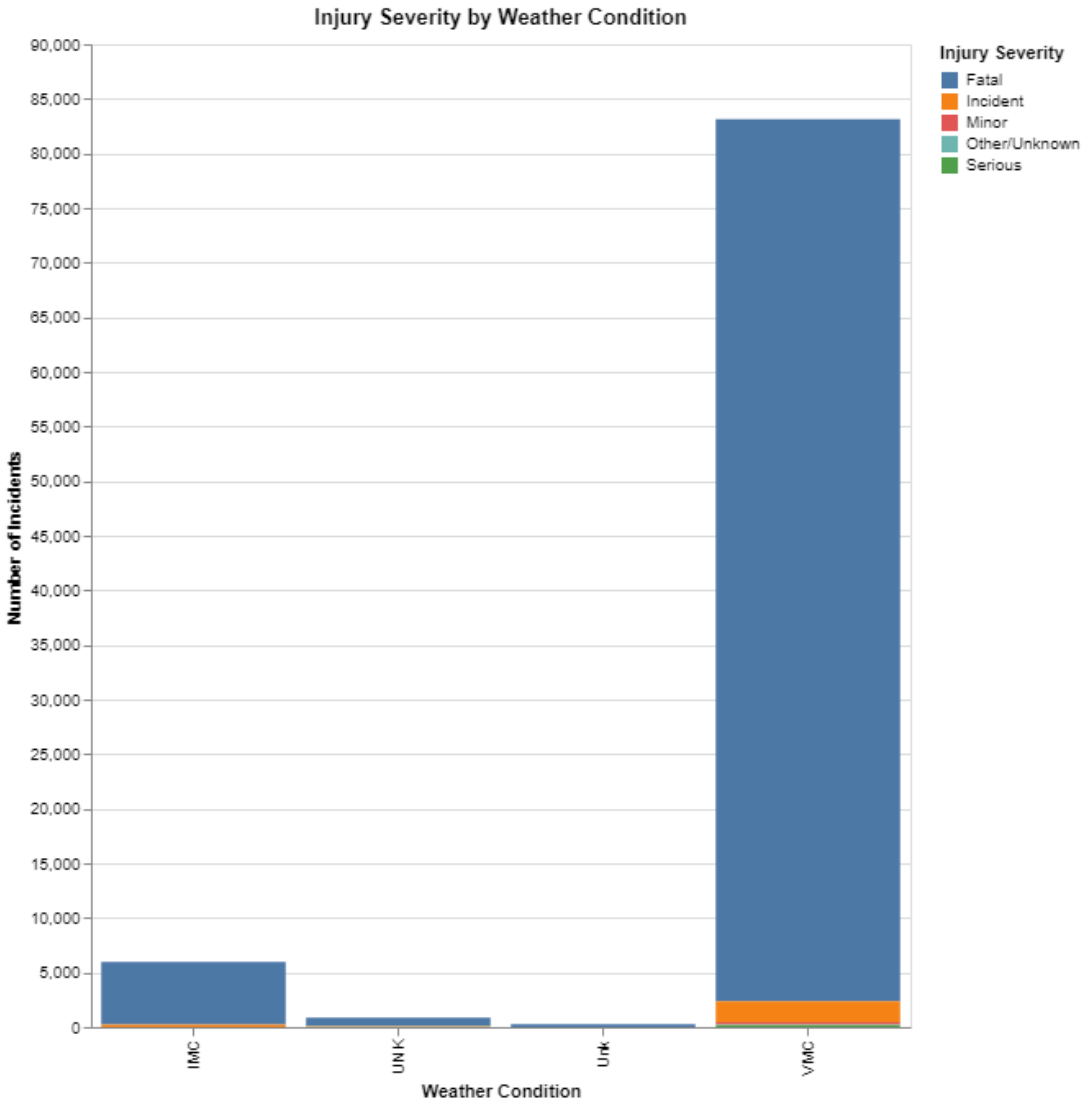
2. Injury Severity by Aircraft Category

This bar chart identifies which aircraft categories experience the most severe outcomes.



3. Injury Severity by Weather Condition

Visualizing how weather conditions correlate with incident severity.



Conclusion

Summary of Findings:

- **Helicopters and Experimental Aircrafts** showed a higher proportion of fatal incidents.
- **Good weather** does not guarantee low risk — many severe incidents still occurred under clear conditions.
- **Personal and Instructional flights** experienced a disproportionately higher rate of severe incidents.

Recommendation:

Start with investing in **Multi-engine Land** aircraft used for **Business or Commuter** purposes under **favorable weather**, as they showed lower incident severity in historical data.

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- **Jupyter Notebook** 100.0%