Risk Analysis for Safe Aircraft Investment

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Business Understanding

- ***Problem statement*** Identify the best plane operating for commercial and private enterprise.
- ***Stakeholders*** -Aviation company executives, safety managers and financial Analysts.
- ***Objective*** - Provide insights that will lead to data driven decisions based on historical aircraft accident occurrence data.
- ***TechStack*** - Python(Pandas, Matplotlib), Tableau(For Interactive Dashboards), Visual Studio Code/ Jupyter Notebook

Data Understanding

Data Sources - National Transportation Safety Board that includes aviation accident data from 1962 to 2023 about civil aviation accidents and selected incidents in the United States and international waters.On kaggle: Link.

Key Features - Make .Model ,Engine Type ,Number of engines ,Number of fatalities and Injuries.

Data has 31 columns and 88889 rows.

Data Analysis and Processing

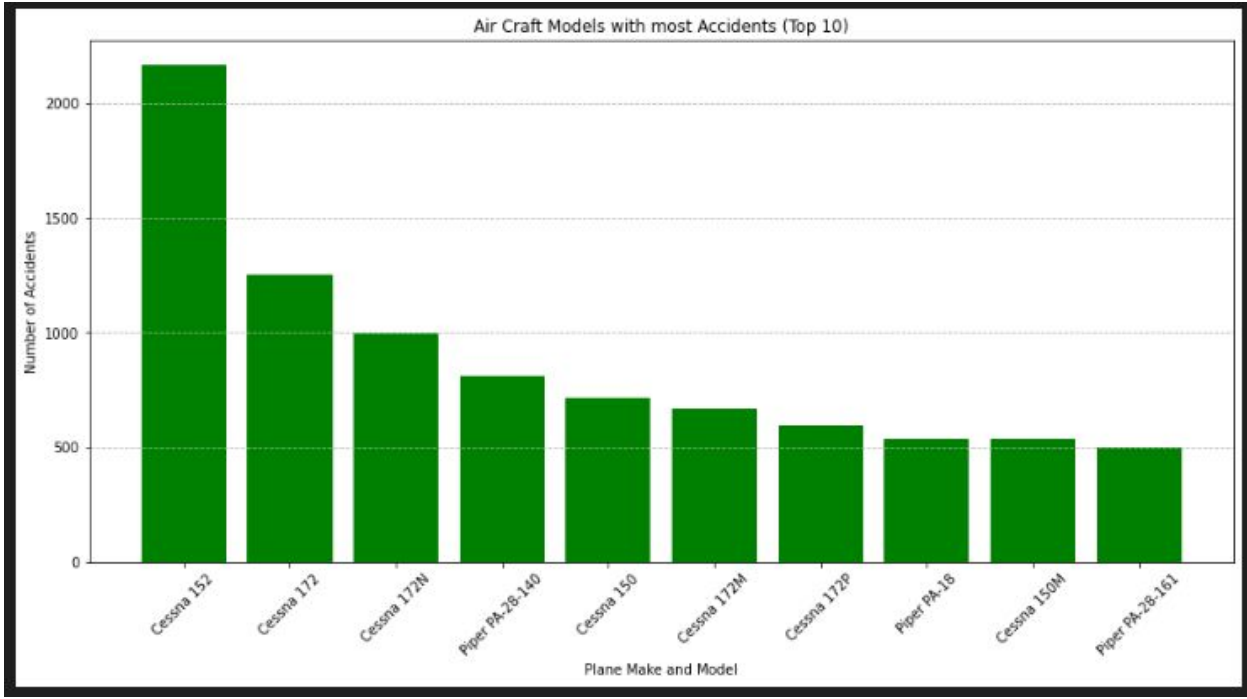
1. Check for missing Values and Duplicates
2. Clean Missing values
3. Group columns for more detailed data understanding

Findings:

- Models with highest and lowest Risks
- Common accident causes and accident trends over time

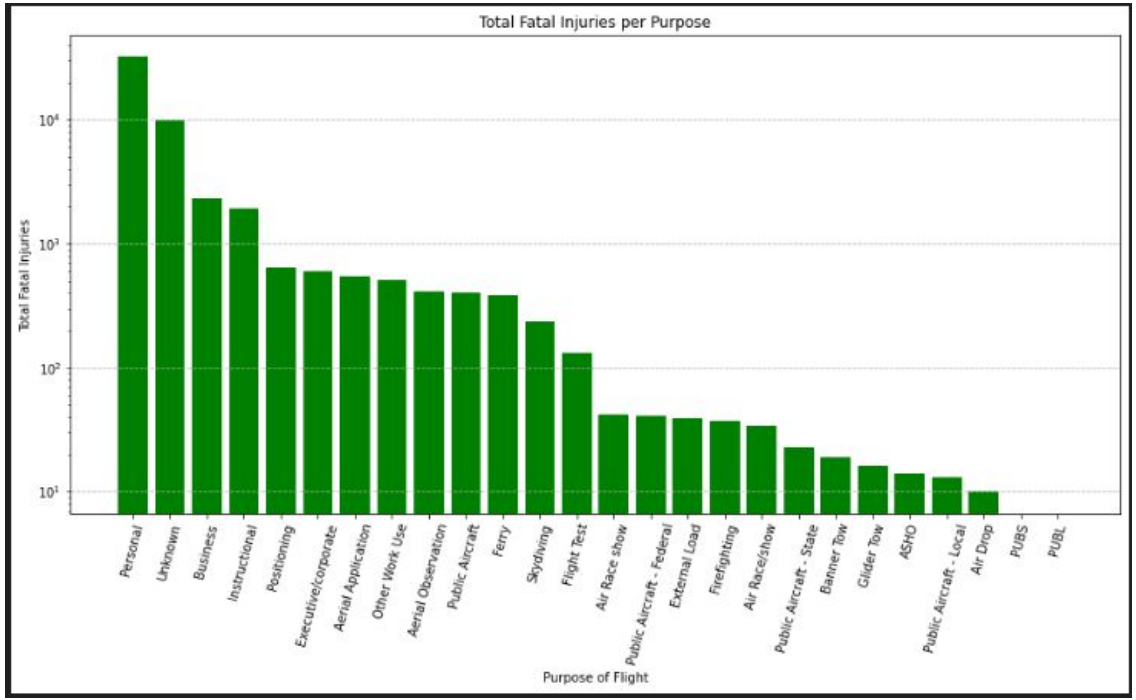
Visualizations

This image shows that Cessna is one of the riskiest plane to invest in a it has most accident rates.



Total fatal injuries per flight purpose

- This image is an indication that the sectors we are planning to invest in are the
- Riskiest, hence on planes to settle with should have the best safety records and other improved operational features



Number of Engines

- Indicates that most accident occur to planes with one engine.
- The more the number of engines the less the likelihood of accident occurrences.
- The ones with `0` are the Unknown to prevent introducing biasness to the important data.

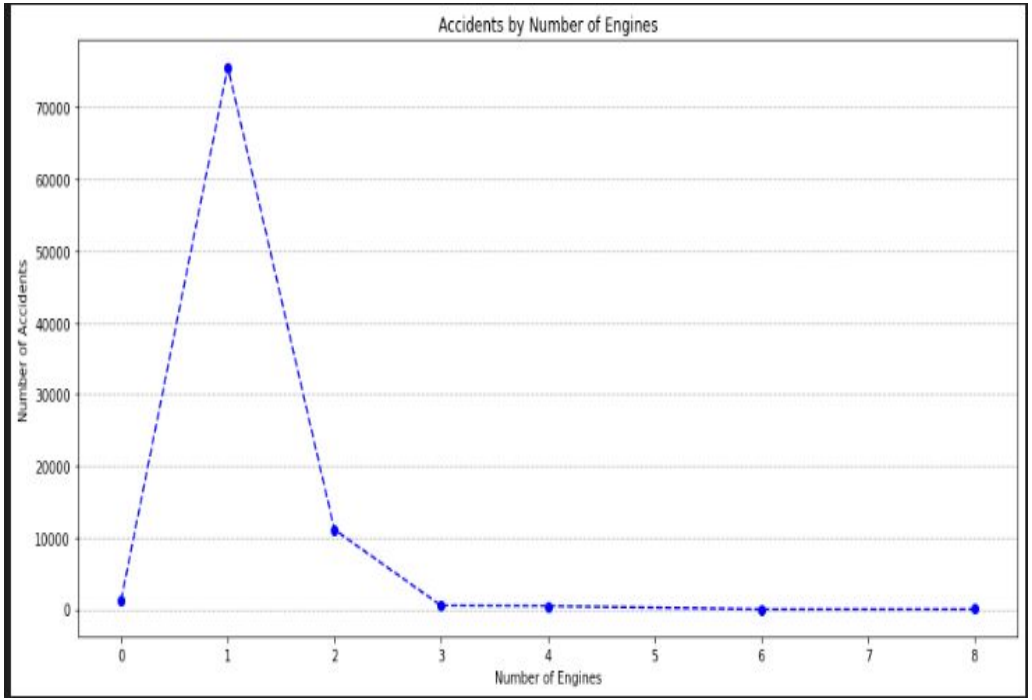
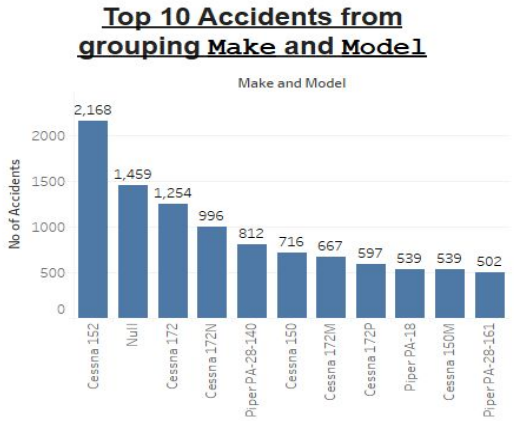
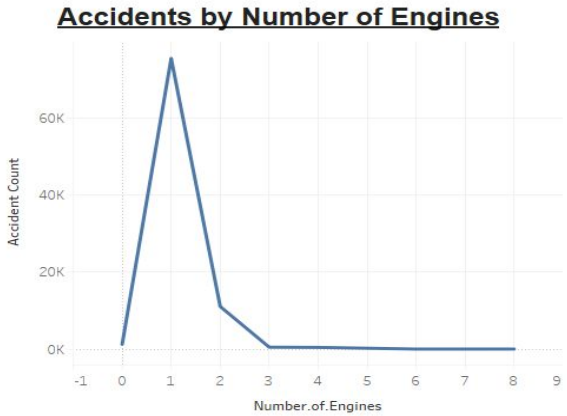


Tableau Dashboard

This Dashboard is a summary of all visualizations that aided with a data driven decision making.





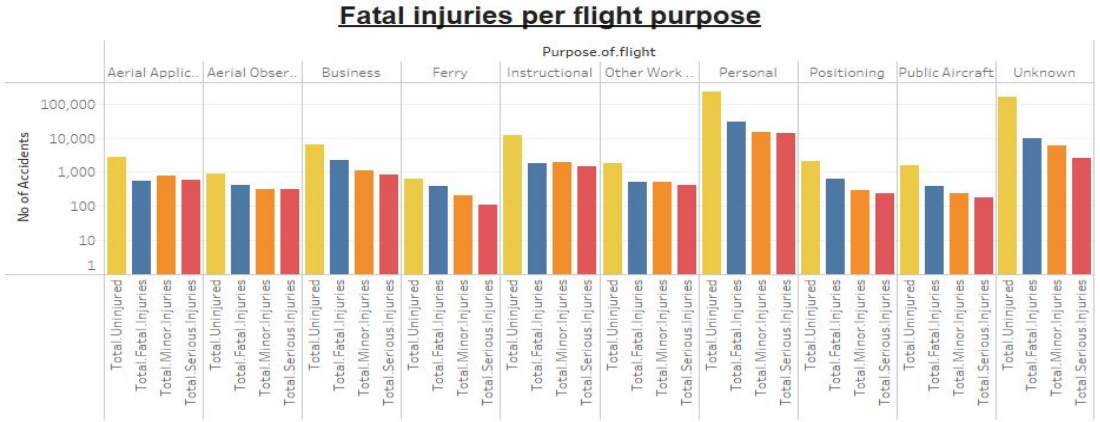
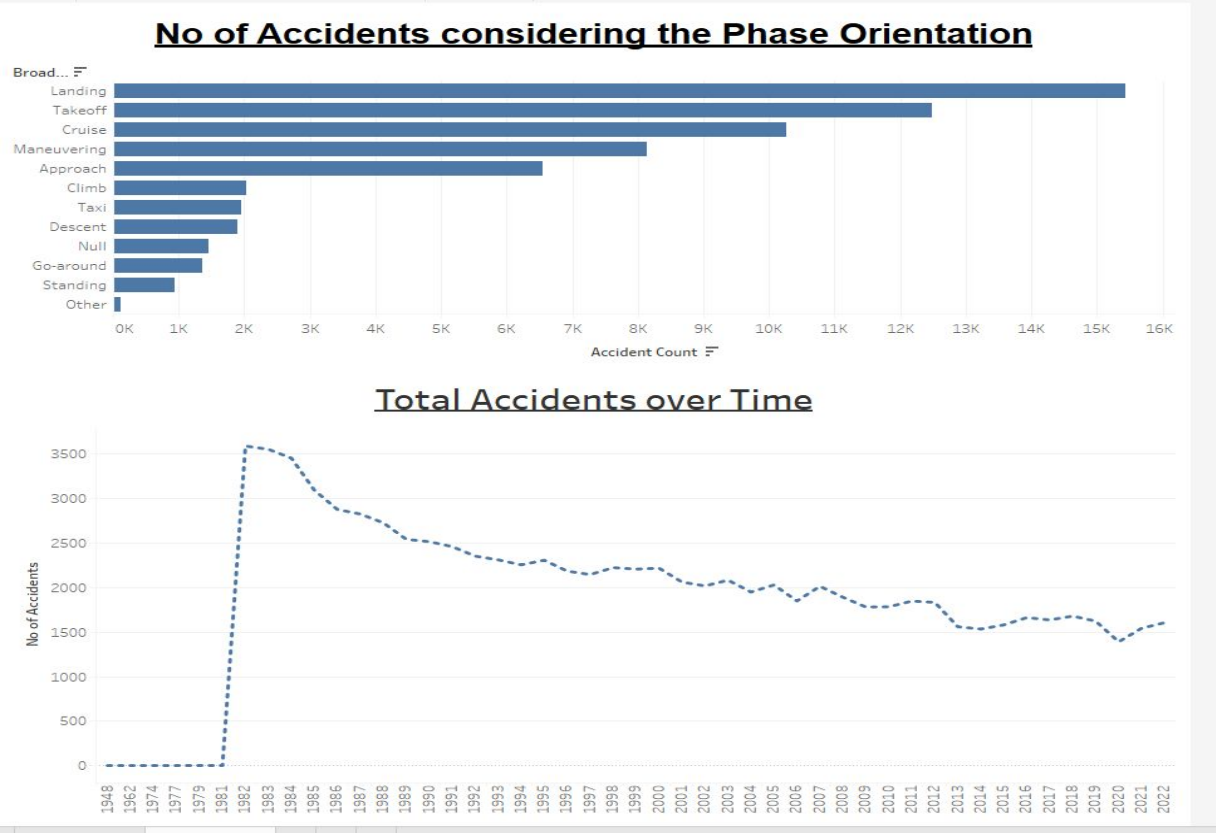


Tableau Dashboard

This shows most plane Accidents occur during Landing and takeoff.



Recommendation

1. Prioritize multi-Engine Aircrafts(***Reciprocating with 6 engines*** or ***LR with 8 engines*** or ***Turbo Shaft with 3 engine*** or ***an electric with 8 engines***)as they pose the lowest risks.
2. Prioritize **DOUGLAS** flights as it has the most business planes with less risks.Specifically ***(C-118A ,C-54GDC, C54GDC,DC-7C)***.
3. Prioritize **BOEING** flights as it has the most business planes with less risks.
4. Invest in aircraft with strong safety records.
5. Implement strict Operational controls for private services.
6. Invest in planes with advanced landing features as during landing most planes have highest risks

Conclusion

Diving into the aviation industry with a data driven solution suggests that ,invest in multi engine ,Douglas(business) is best and BOEING(private) tops the list for makes we listed above.These crafts pose lower risks compared to other aircrafts.

Any Questions(Q & A)

Reach out:

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