



Group 5 Final Project

Title: Aviation Accident Database & Synopses, up to
2023

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Problem Statement:

- This project aims to analyze and visualize data on aviation accidents in the US since 2008 to uncover trends and patterns in safety and understand underlying causes.
- By presenting this information in an accessible format, it hopes to raise awareness among aviation professionals, regulators, and the general public to improve safety and prevent future accidents.
- The ultimate goal is to enhance aviation safety in the US and minimize the occurrence of aviation tragedies



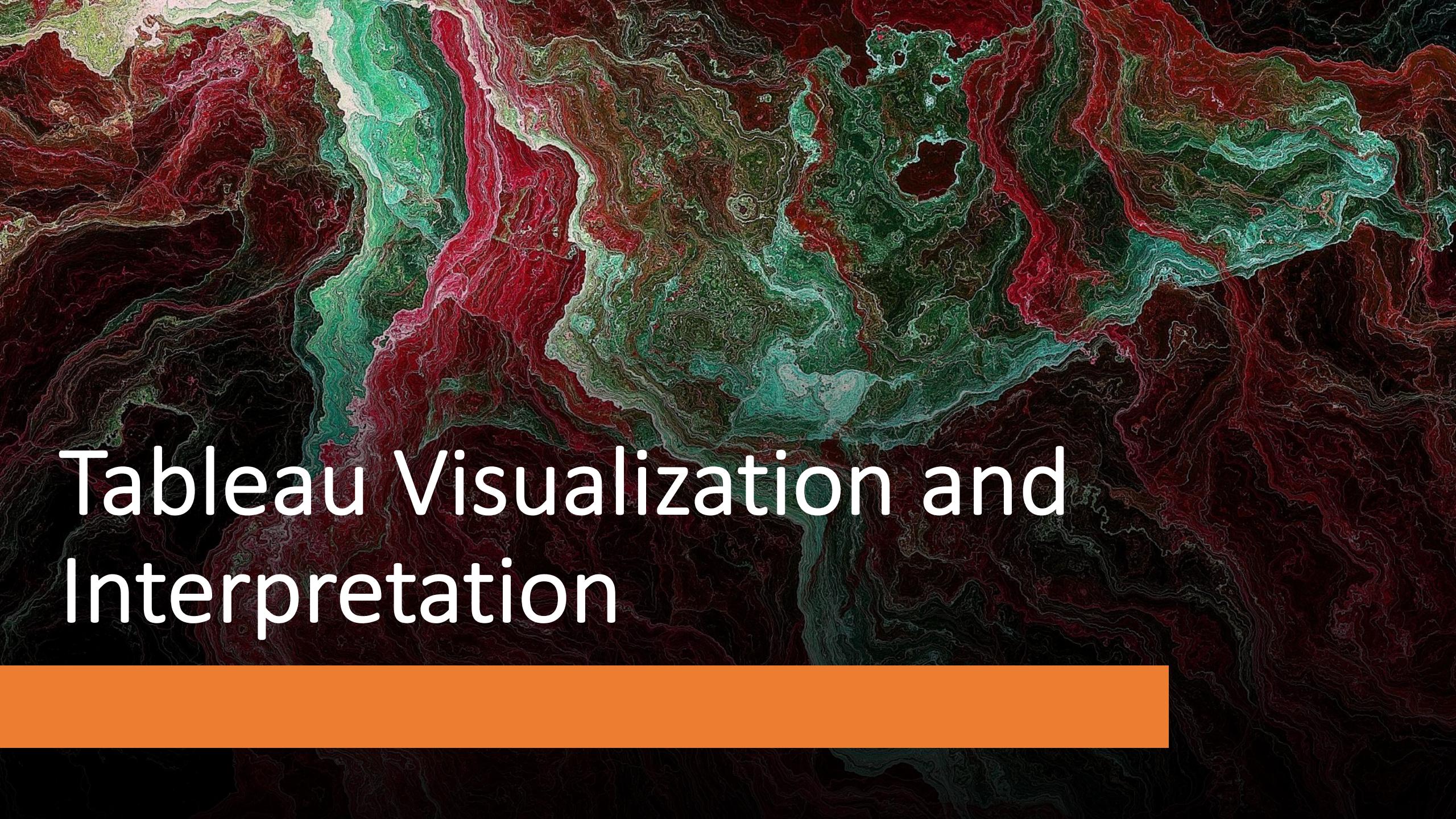
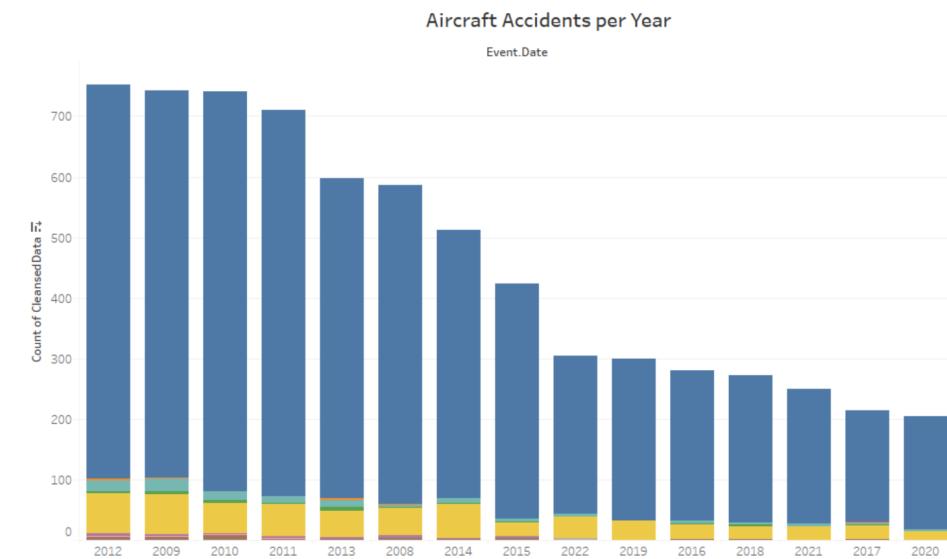


Tableau Visualization and Interpretation

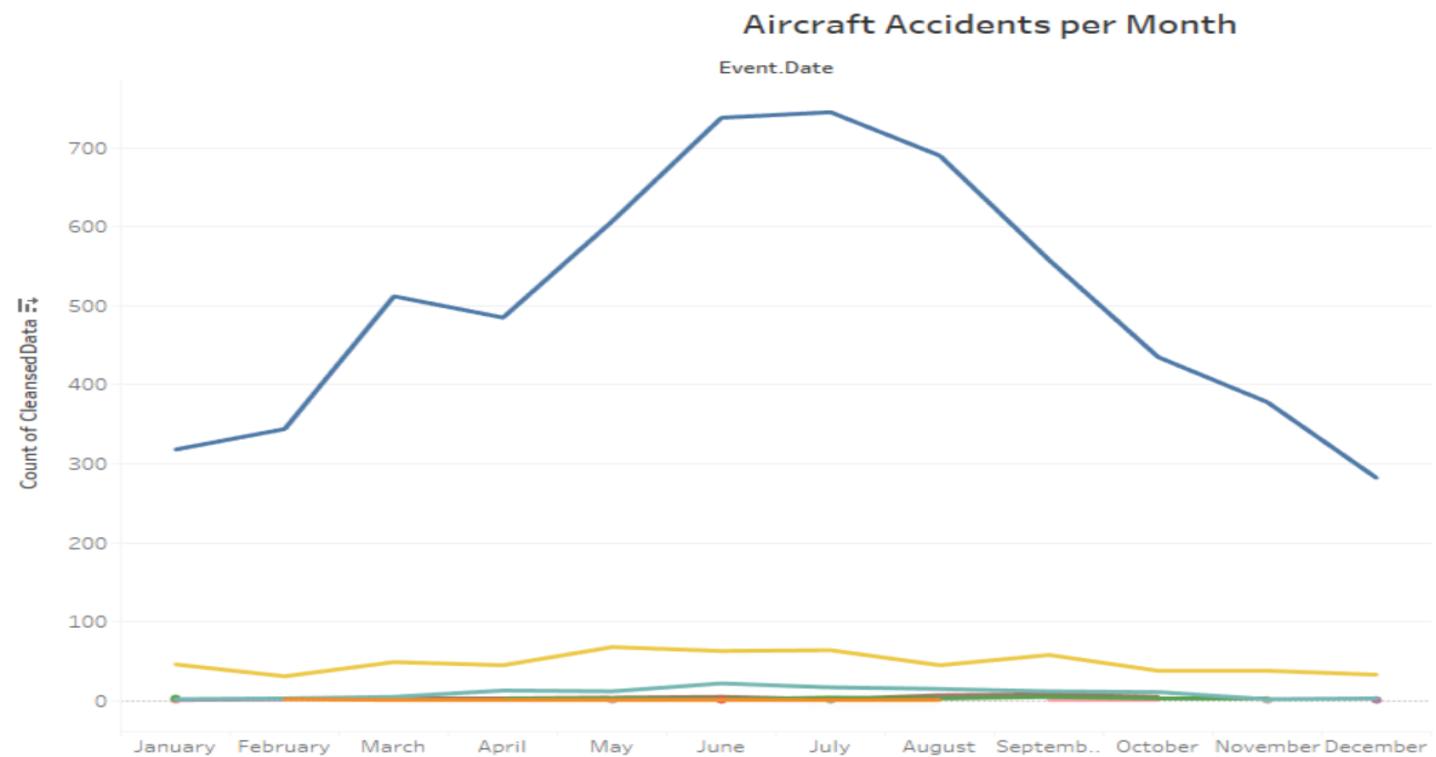
Aviation Accidents per Year

- The most aviation accidents occurred in 2012.
- The least number of aviation accidents occurred in 2020.
- There is no significant correlation between year and number of aviation accidents.
- Aviation accidents make up the majority of the total accidents each year followed by helicopter accidents.

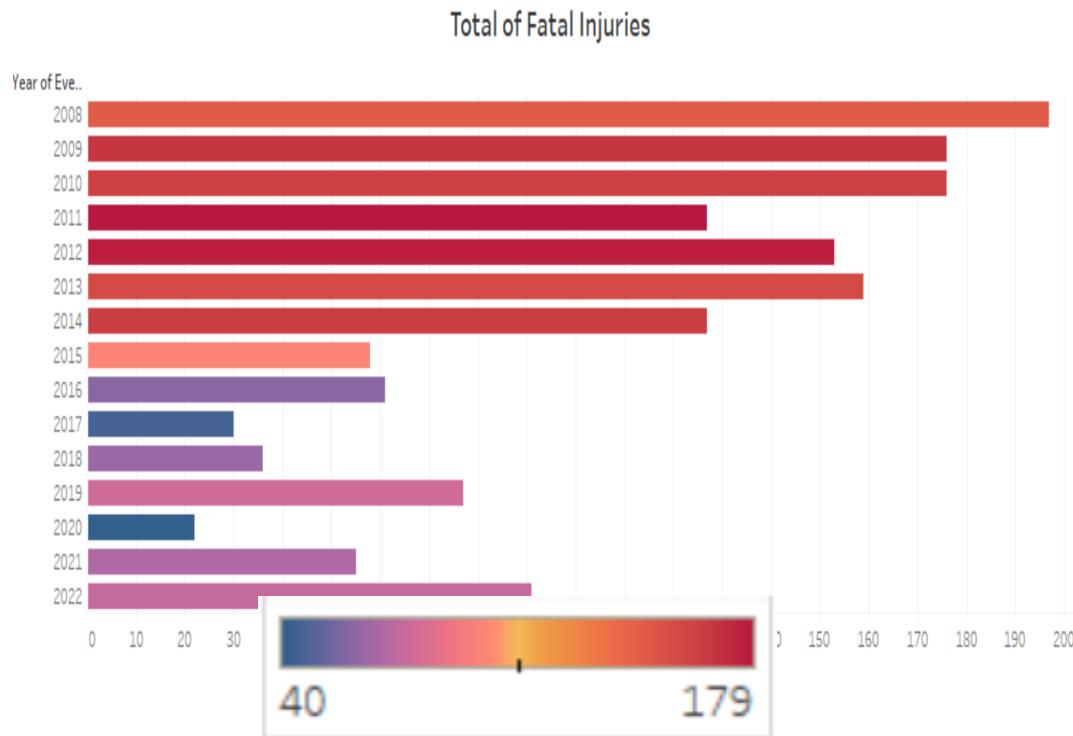


Total Aviation Accidents per Month

- The most aviation accidents occurred during the summer.
- The trend shows that accidents steadily rose each month and began declining after July.
- Research shows there are a lot more flight risks like thunderstorms that cause accidents to occur in the summer months.



Total Aircraft Accident Fatalities

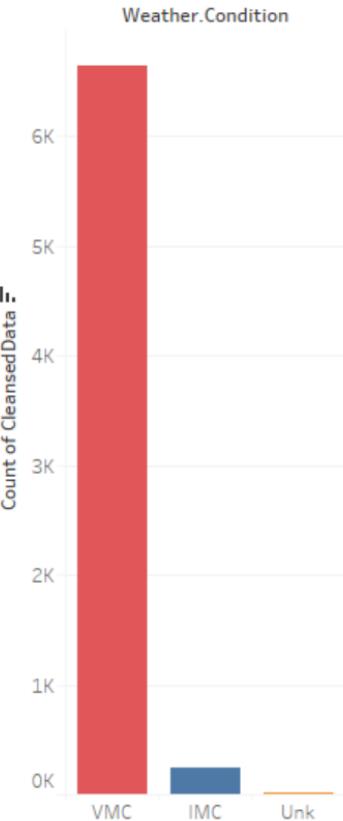


- The most aircraft fatalities occurred in 2008 and it was a total of 197 people with an additional 148 people who were seriously injured.

- The least amount of aircraft fatalities occurred in 2017 with 30 fatalities.
- The total number of fatalities due to aircraft accidents has decreased almost every year since 2008.

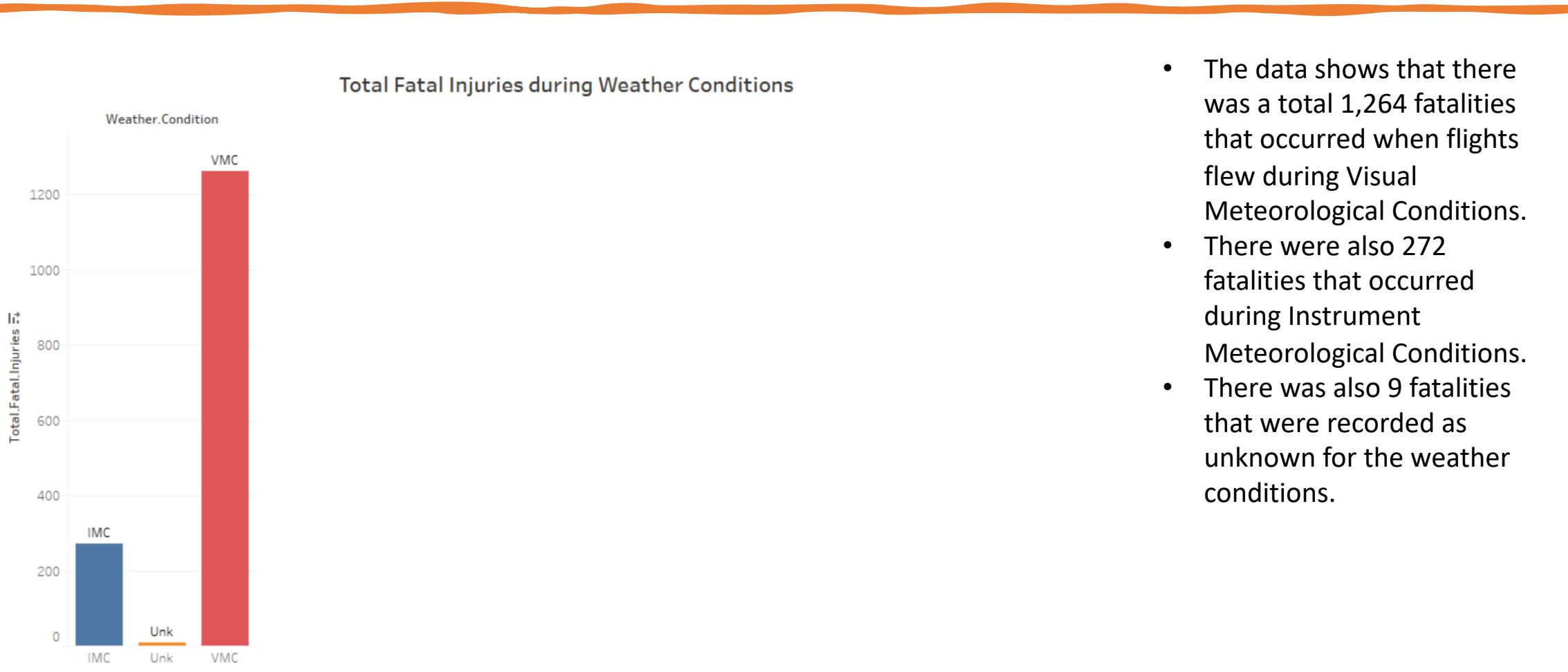
Weather Conditions During Aviation Accidents

Weather Conditions During Aircraft Accidents

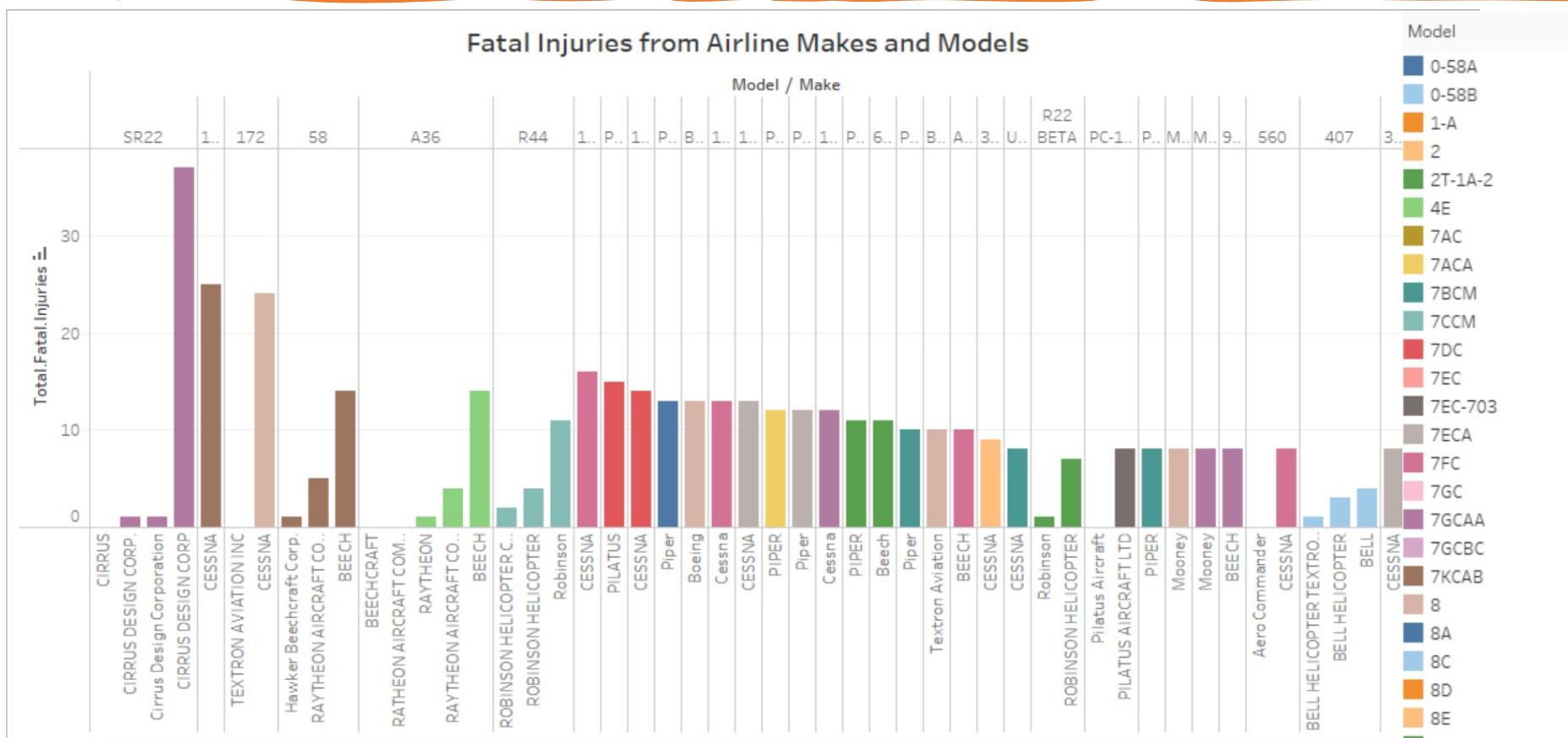


- VMC stands for Visual Meteorological Conditions. VMC is an aviation flight category in which pilots have sufficient visibility to fly. There were 6,635 accidents related to VMC weather conditions.
- IMC stands for Instrument Meteorological Conditions. IMC is when weather conditions are below the minimum required for flight under Visual Flight Rules.
- The data shows that there were more aviation accidents that occurred during VMC conditions - which is better conditions than IMC.
- This could be due to less flights taking place due to the poor conditions.

Total Fatal Injuries vs. Weather Conditions

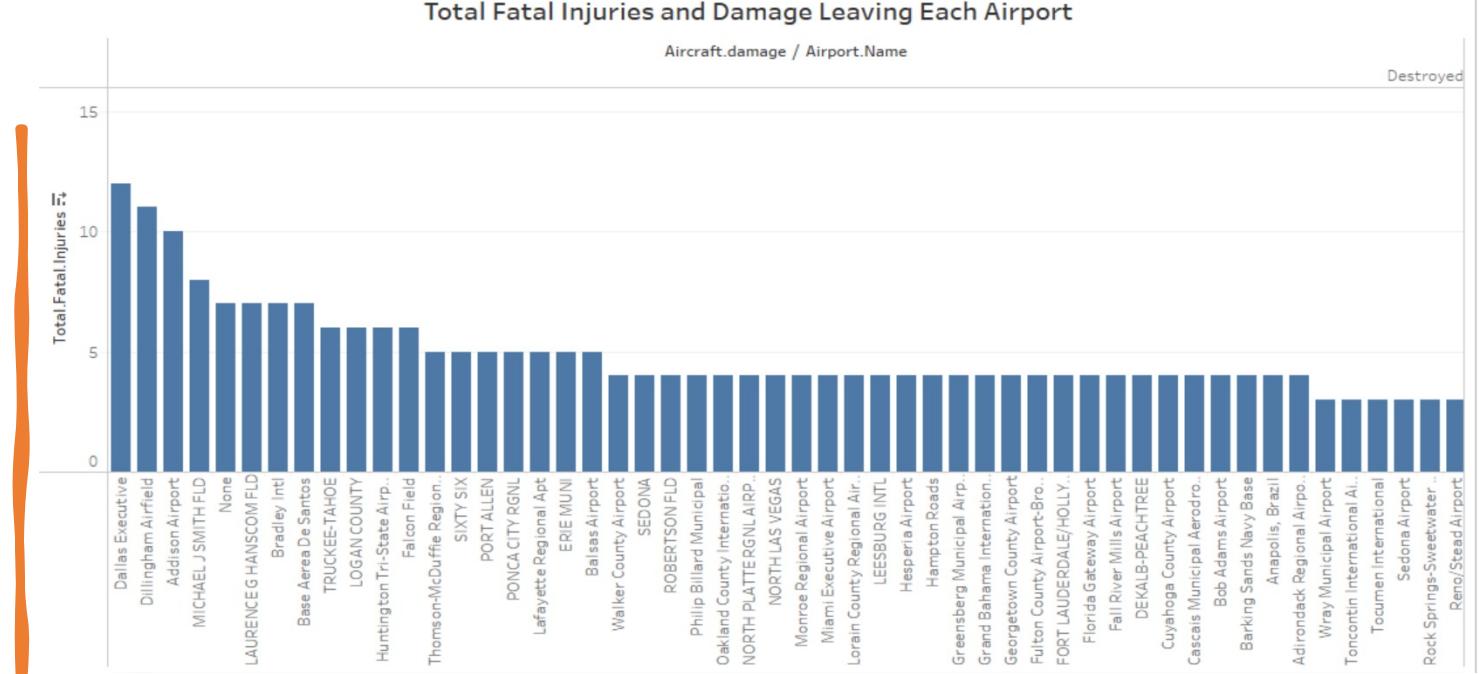


Fatal Injuries from Aviation Makes and Models



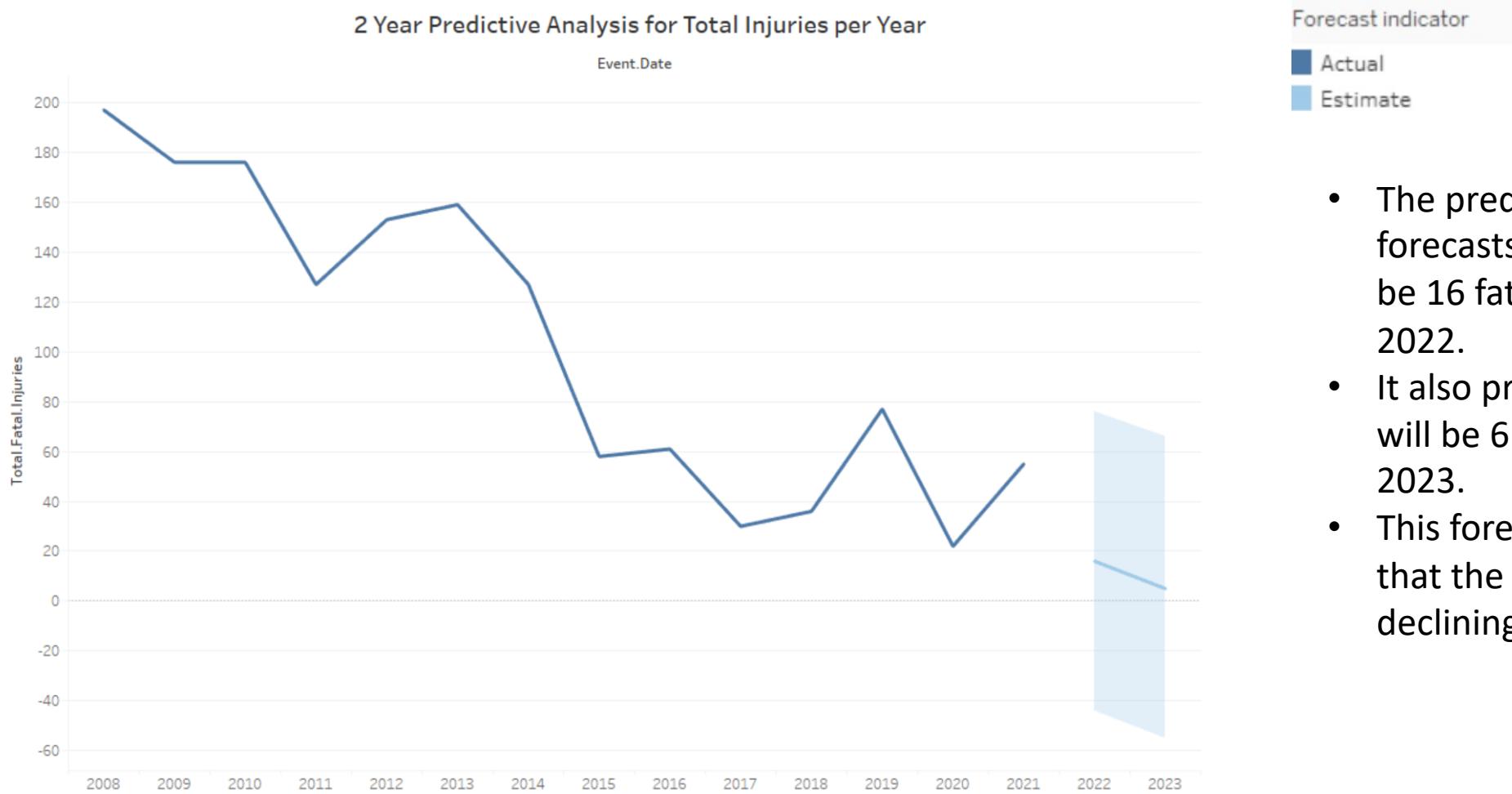
- The most aviation accidents occurred with the make Cirrus Design Corp and the make is an SR 22.
- The total of aviation fatalities from this make and model was a loss of 37 lives.

Total Fatal Injuries for each Airport by Aircraft Damage



- The top 3 airports that had planes leave and have accidents were Dallas Executive, Dillingham Airfield, and Addison Airport.
- The Dallas Executive Airport had a total of 12 fatal injuries.
- Dillingham Airfield has a total of 11 fatalities.
- The Addison Airport had a total of 10 fatalities.

Predictive Model for Total Fatal Injuries



- The predictive analysis forecasts that there will be 16 fatal injuries in 2022.
- It also predicts there will be 6 fatal injuries in 2023.
- This forecast shows us that the death rate is declining each year.

Predictive Model for total Injuries per Year

2 Year Predictive Analysis for Airline Injuries per Year

	Event.Date															
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total.Fatal.Injuries	197.0	176.0	176.0	127.0	153.0	159.0	127.0	58.0	61.0	30.0	36.0	77.0	22.0	55.0	16.0	5.0
Total.Minor.Injuries	77.0	108.0	97.0	117.0	100.0	84.0	67.0	57.0	28.0	28.0	29.0	38.0	28.0	35.0	33.0	33.0
Total.Serious.Injur..	148.0	168.0	163.0	179.0	177.0	157.0	164.0	99.0	60.0	45.0	64.0	78.0	40.0	69.0	63.0	63.0
Total.Uninjured	755.0	831.0	834.0	817.0	949.0	679.0	763.0	550.0	412.0	266.0	375.0	386.0	284.0	344.0	277.0	245.0

Forecast indicator

- Actual
- Estimate

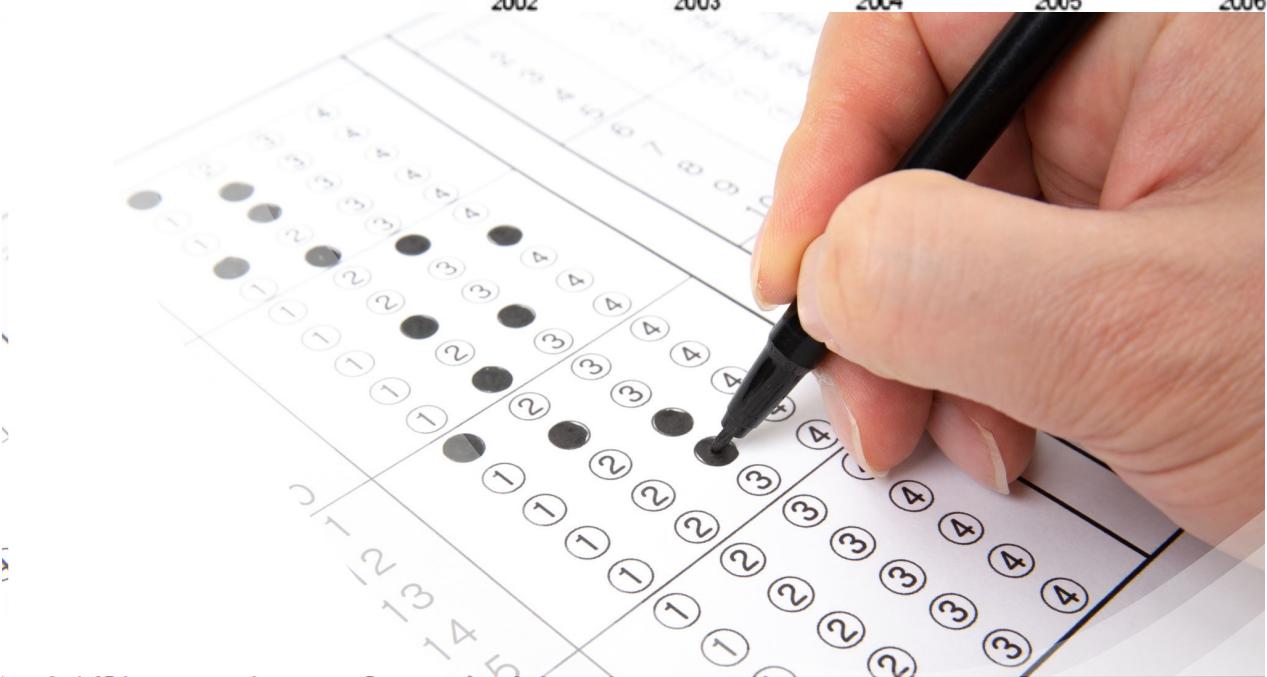
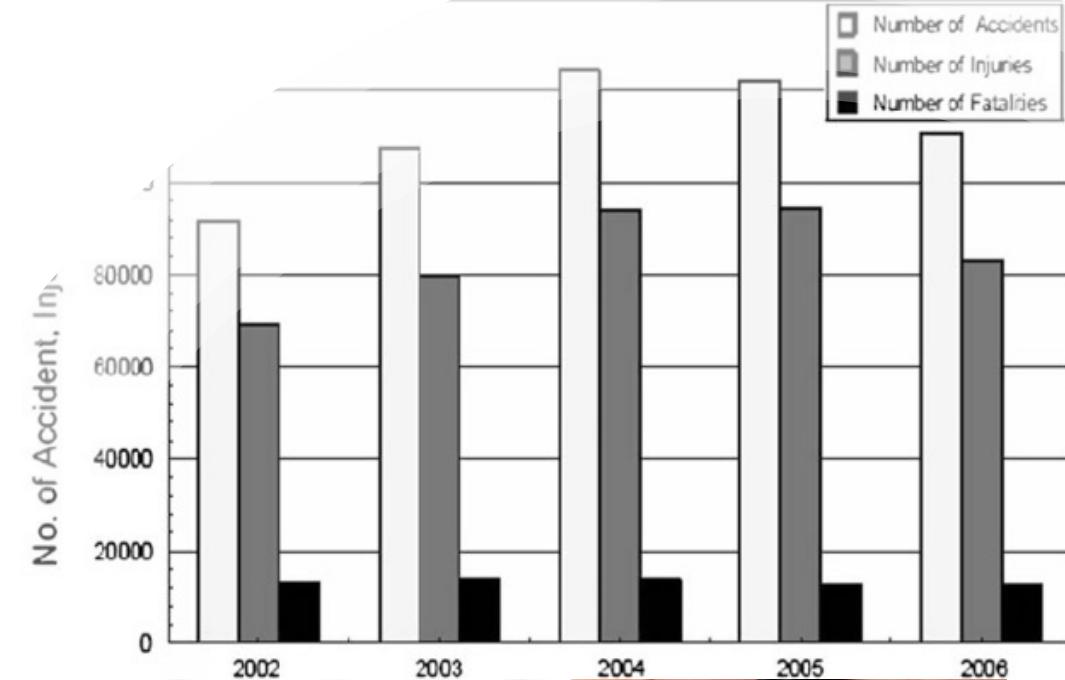
- This model forecasts how many total injuries there will be in the next 2 years.
- The forecast predicts that there will be 389 total injuries in 2022.
- The forecast predicts that there will be 346 total injuries in 2022.
- Each injury category is expected to decrease in the next 2 years.

Model Evaluation criteria and final model

THE MODEL EVALUATION CRITERIA ARE TOTALLY BASED ON PREDICTIVE ANALYSIS WITHIN EVERY YEAR.

THE MODELS INCLUDED ARE FATAL, MINOR, SERIOUS, UNINJURED FOR THE YEAR ANALYSIS.

THIS FINAL MODEL GIVES THE CRITERIA FOR THE ANALYSIS BASED ON TWO YEARS OF THE AIRLINE'S REPORT.



Interpretation of the findings and recommendations

- The results from the analysis of the comparison of the values for the Airline Injuries will show the decrease of the injuries compared to the year 2008 it is better in 2023.
- As seen from the graph, it shows how the injuries have decreased with the event date.
- I recommend getting the data for the Airlines injuries is comparing the values with the Event date and total fatal injuries gives the best report.





Summary and Lessons Learned

- The key takeaway from this project is that data visualization plays a critical role in conveying complex information in a meaningful way.
- By using visualizations, we can gain a deeper understanding of data and identify trends and patterns that might not be apparent through raw data alone
- Through analysis were able to see that the total number of injuries occurring from aviation accidents each year have decreased throughout the years.
- Using predictive modeling we also learned that the total number of injuries will also decrease in the following 2 years.

Future Extensions

- To Compare aviation tragedies in the US to those in other countries
- This could provide valuable insights into the differences and similarities in aviation safety practices across different countries.
- Users who will benefit the most from our analysis would be pilots, and people who are planning on flying in the future.
- Pilots can determine if they feel safe flying in certain weather conditions based on our models.
- Pilots and flyers can also learn what makes and models are the safest if they are considering flying or buying a specific make or model.



References

- Asset Protection, Pilot Liability. (n.d.). *COMMON CAUSES OF SMALL PLANE ACCIDENTS*. Bing. Retrieved April 2023, from <https://www.bing.com/search?pglt=41&q=why%2Bare%2Bthere%2Bmore%2Baairline%2Baccidents%2Bin%2Bthe%2Bsummer&cvid=9899d60a9b3e48f18ca7417c57518e46&aqs=edge..69i57j69i11004.11535j0j1&FORM=ANNAB1&PC=U531&ntref=1> (slide 5)