COMP 4304 Project Checkpoint

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Broad Goal:

Where should efforts be focused to improve the safety of Canadian air space?

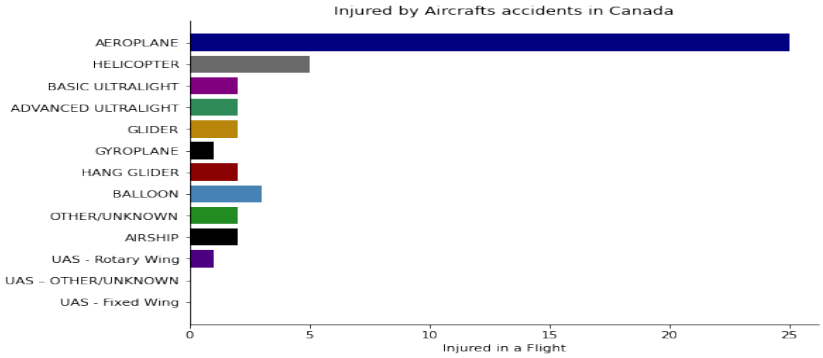
Sub Goals:

- To identify the type of aircraft caused the serious incidents and the locations where these were reported.
- To identify top 10 most common reasons for the incidents over the last 25 years, including aircraft manufacturer and model.

Throughout the investigation, we gathered 4 visualizations to show the causes and the locations where flight accidents occur the most.

1. Bar plot showing accidents in a single flight (Final Visualization):

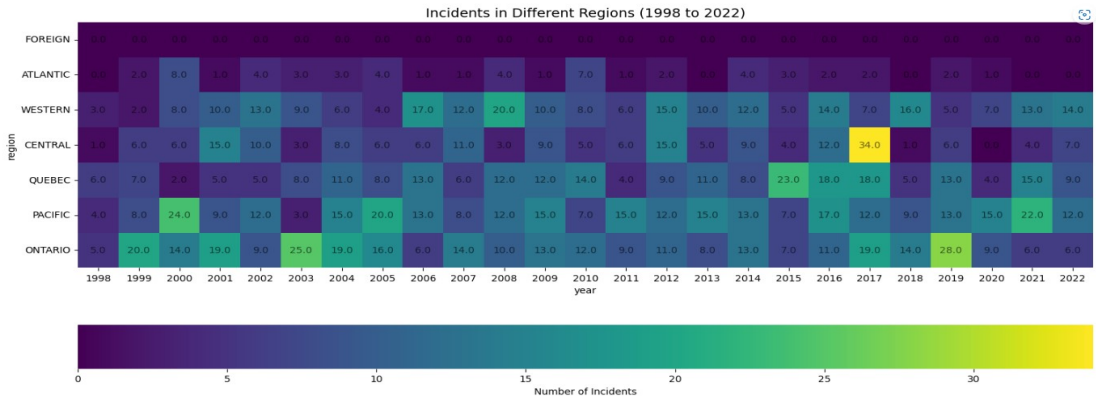
   The purpose of this visualization is to show the most number of people injured during a single flight by different types of aircraft. The data is refined with the condition that the incidents were serious and that the incident is severe and injuries are reported from 0 to many.



   The visualization uses a bar plot as it is effective in comparing the frequency of different categories. The bar plot shows that Aeroplane has the highest number of accidents, followed by Helicopter and Basic Ultralight.

2. Heatmap showing accidents rate in different regions of Canada:

   The purpose of this visualization is to show the distribution of accidents across different regions in Canada. The heatmap is colored according to the number of accidents, with lighter colors representing a higher number of accidents. The visualization uses a heatmap as it is effective in showing the density of data points across a geographic region.



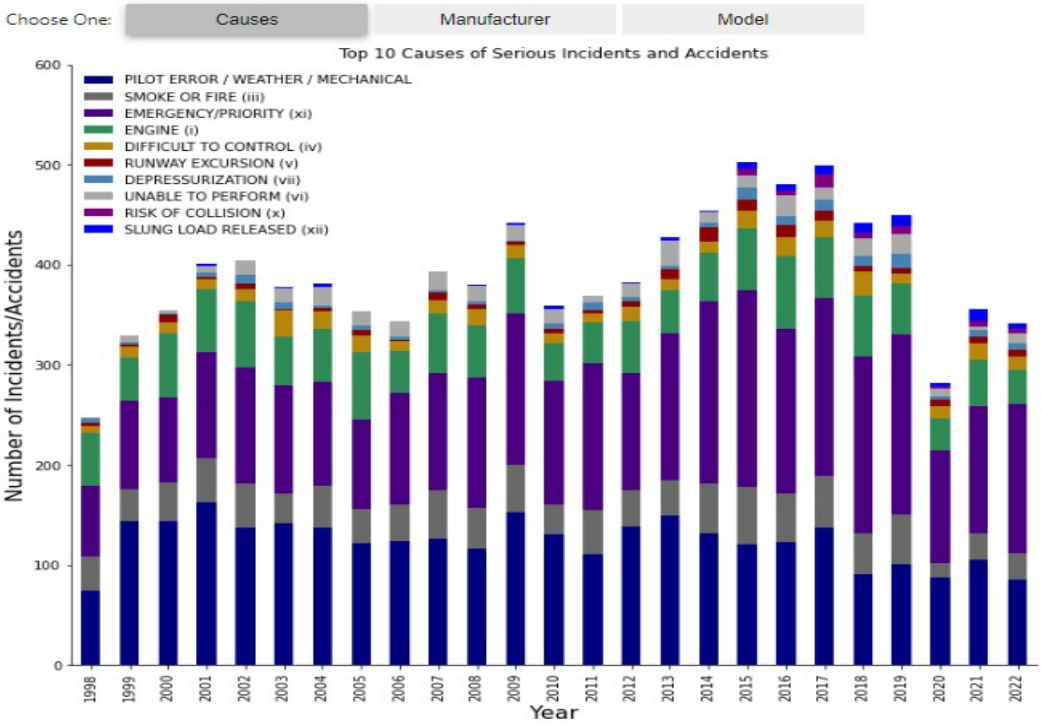
The heatmap shows that Ontario has the highest number of accidents, followed by Pacific and Quebec.

3. Interactive plot of top 10 causes for flight accidents, their manufacturers and model:

   The purpose of this visualization is to explore the top 10 causes for flight accidents over the last 25 years, including the aircraft models and the manufacturers involved in the accident. The visualization is interactive, allowing the user to hover over the data points to obtain additional information.

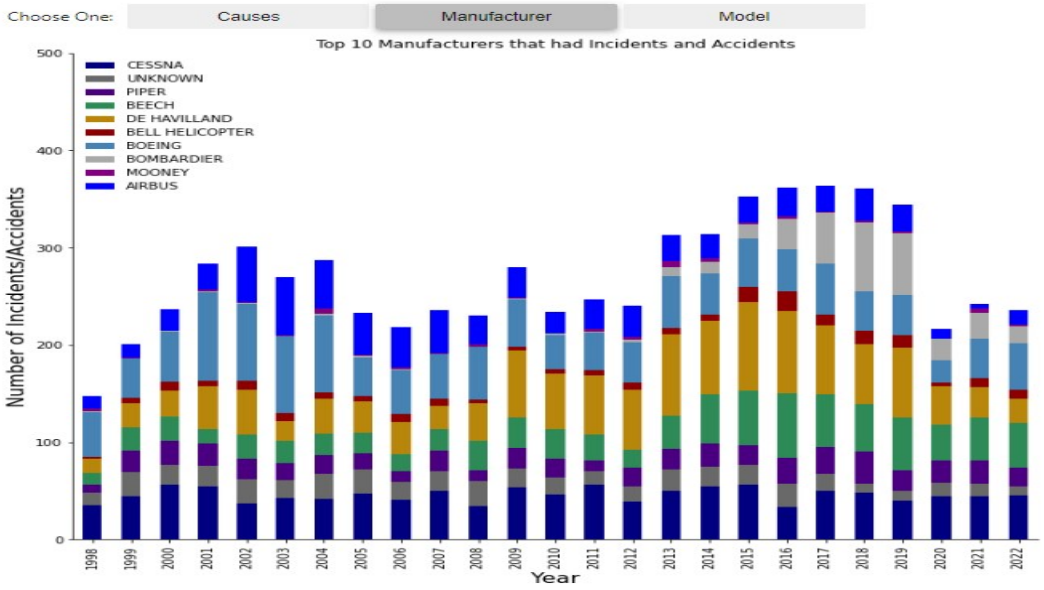
   Causes tab:

   The plot shows top 10 reasons why the accidents occurred in each year. Pilot Error/ Weather/ Mechanical is the main reason behind these incidents followed by Smoke or Fire and Emergency/ Priority.



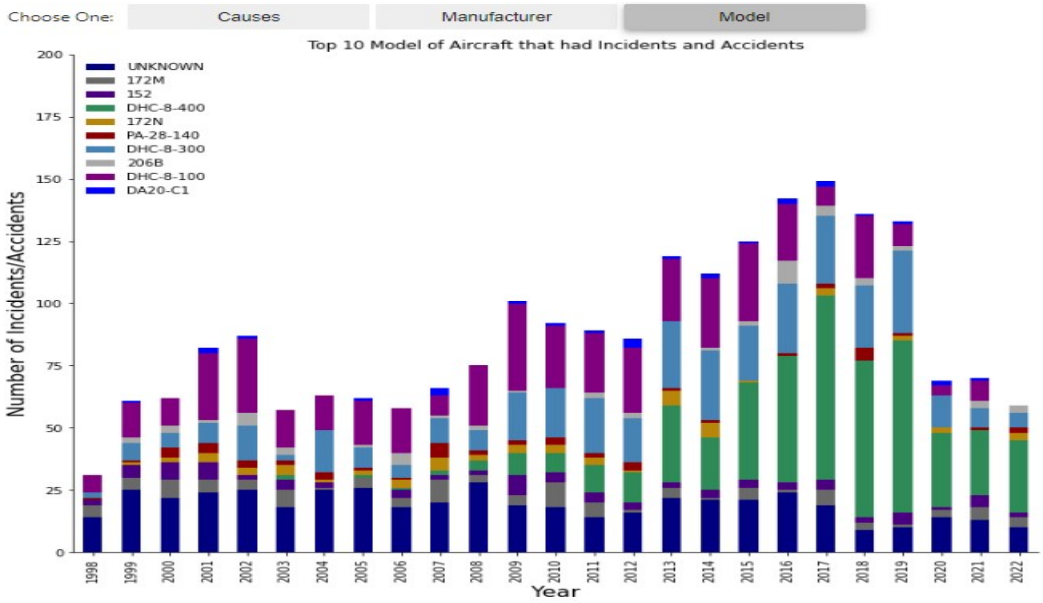
   Manufacturer tab:

   This plot shows the top 10 aircraft manufacturers responsible for the errors in the aircraft causing severe incidents. CESSNA is has the most mechanical errors causing flight incidents over the years.



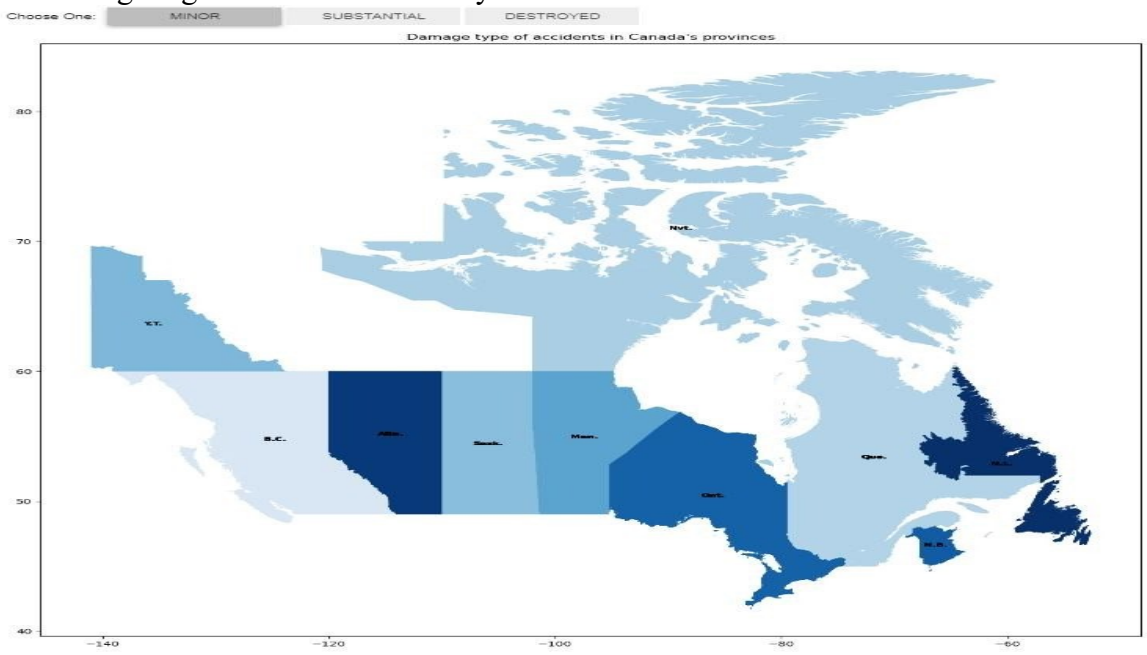
Model tab:

Which models of the aircraft have caused serious injuries over the years is shown in this tab.

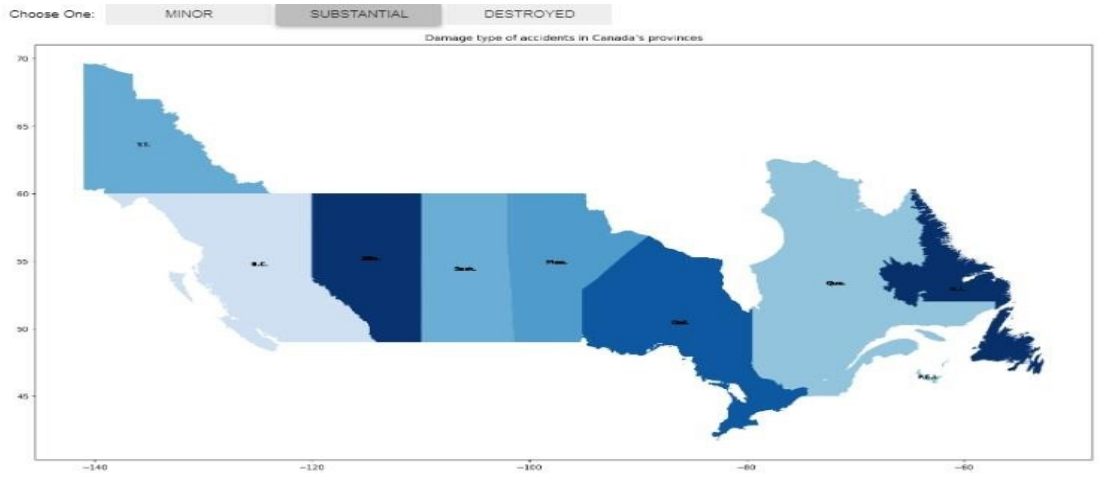


4. Map of Canada showing the provinces where all the plane accidents occurred:

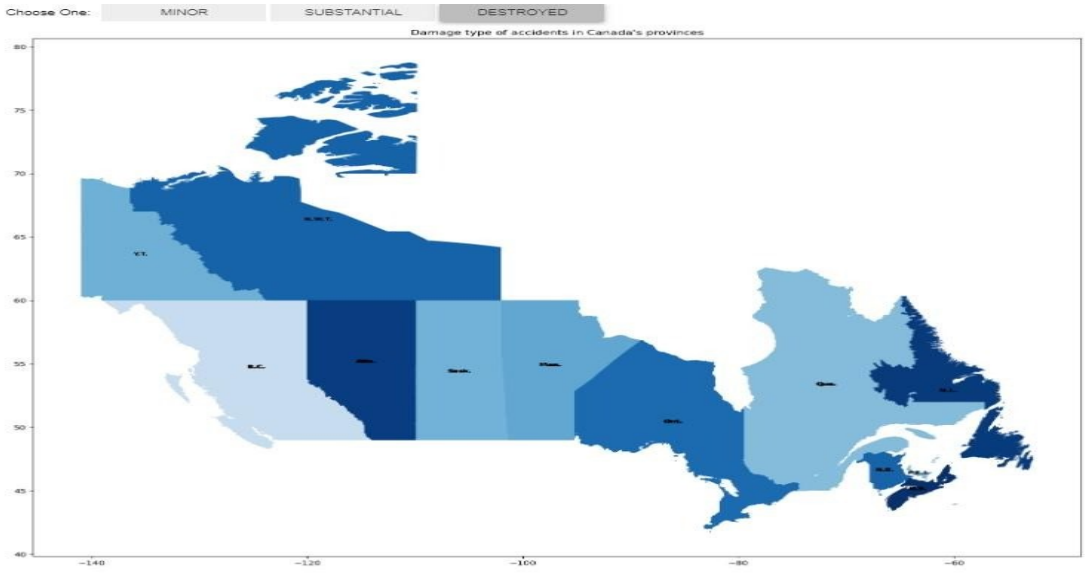
The purpose of this visualization is to show the geographic distribution of accidents across the provinces in Canada. The visualization uses a map, with different colors representing the severity of the accidents - SUBSTANTIAL, DESTROYED, and MINOR. The map is effective in showing the hotsopts of the accidents across a geographic region of Canada. The map shows that Ontario has the highest number of accidents. This plot shows the damages in provinces with the color dark to light mentioning few reported incidents to high regions across the country.



From the geopandas plot, we can see that over the last 25 years Ontario has the most minor accidents while Yukon, New Brunswick, and Nunavut have the least MINOR accidents.



Similarly, In 2022 Ontario had the most SUBSTANTIAL damage type accidents leaving British Columbia the second one while Newfoundland and Labrador, and Prince Edward Island had the least substantial damage due to airplanes accidents.



Furthermore, over the last 25 years again Ontario had the most destructive accidents while Northwest Territories had the least.

Till now, we have only showed the minor and destroyed type of damage in our geopandas plot for the last 25 years and for substantial type of damage we have only brought the accidents that took place in the year of 2022. Our next motive is to add a flicker or dropdown box for the years which will allow us to focus only the accidents that took place in that particular year. It will help us to understand more properly that in which province and in which year the aeroplanes accidents have done minor, substantial or severe damage.

Our first two visualization covers the first sub goal and the 3rd one covers the 2nd sub goal of this project. The final visualization will explain in which areas of the country should the focus be more strict to decrease the incidents in Canadian airspace.