**Project Demo**

1. Group Member Contributions

* Sonia Islam
  + GUI
* Yuhua Guo
  + csv reading and MongoDB database writing module
  + data analyzing function and chart drawing function
* Scott Tianhan Jiang
  + Reading and writing function
  + Map drawing and html writing function

1. Questions

* Describe how the read and write to the database works?

Answer:

* + The write\_to\_db module handles csv file reading and writing to MongoDB.
  + In this module, a function called readCSVFiles uses os.walk to find all csv format files.
  + Another function called readAndInsertFile will parse csv file name to determine the data type is “Volumes” or “Incidents”, and those two names will be the mongoDB database name. Similarly, the “year” variable used in mongoDB collection name are also parsed from csv name. The complete collection names are in the format of type + “\_” + year, and will be used later when reading from database.
* Describe how sorting the data and find the max value works?
  + The read and sort buttons are using the same function, read\_db function. This function takes one Boolean variable to determine if query results are displayed in sorted order or unsorted order.
  + Upon a selection of database name (type) and collection name (year), volume type data are queried in each collection, but incident type data are queried only from “Incidents\_proj” collection.
  + Data are loaded into pandas DataFrame, with an re-organized column names.
  + For the type “Incidents”, data entries are grouped using DataFrame.groupby() function.
  + Then the re-organized dataframe will be sorted by either “volume” or “Count” column.
* Describe how analyzing data and drawing charts works?
  + The data from dataframe are analyzed at backend in db\_operation module using either analyze\_top\_volumes() function or analyze\_top\_accidents() function.
  + For either volume or accident type, all data are sorted first, append the result in a list, iterate through all years(2016-2018), then return a list with top volume/accident count.
  + Either analysis function will be called from GUI depending on type.
  + In front end, the onclick() function will detect if the analysis button has been clicked. If yes, it will destroy all widget on all 3 tabs, then attached the plot to tab 2.
* Describe how map drawing and writing the map.html works?
  + Take type and year variables from GUI, and call sort function to give a dataframe of specific type and year.
  + Then create a map object using folium and initialize the map with coordinate of Calgary area.
  + If the type is incident, easily take the first data row, extract latitude and longitude value and use them in marker function’s variable. Then add the marker onto map object.
  + If the type is volume, take string value from “the\_geom” document, split it into list, and take first 2 and last 2 float type elements from the list. Those 4 data are latitude and longitude values of start and end point. Plot a polyline in map and 2 markers on each end.
  + Finally, save the map object with markers/lines with map.save. Then open the map in webbrowser by webbrowser.get().