

In the last report, I focused on data cleaning like:

1. converting the elapsed time in milliseconds since 1970 January to year, month, day, hour, minute, seconds.
2. converting x and y coordinates from CA State Plane III in NAD 83 to the Georgia Plane coordinate system (Georgia West).
3. Using GeoPandas to create the geometry column to store all points of locations of trips.

In this iteration, I focused on the data analysis part of my project:

1. I used Folium library to create an interactive basemap integrated in the Jupyter Notebook. Level of details range from 10 to 19, focused on the centroid of Georgia (the location where the trajectory data is)
2. I mapped the velocity of the vehicle into 5 categories and visualized the velocity as a color coded line on the basemap.
3. I mapped the acceleration/deceleration of the vehicle into 5 categories and visualized the acceleration/deceleration as a diverging color coded line on the basemap.
4. Created a pop-up for the data scientist to know the coordinates, velocity, acceleration of the vehicle at each point of location.

Next step:

1. I will implement a new feature to identify the moments that the vehicle exceeds a safe range of acceleration or deceleration. I plan to circle out these moments in red and pop up an alarm message to remind the user that the vehicle is speeding or making a hard stop.
2. I am still thinking about how to visualize the lane changing behavior of the vehicle. It also depends on how close we can zoom in and if we can see lanes on the specific basemap.
3. According to the feedback from my peers, I will provide guidance for the user to use this Jupyter Notebook. I am thinking of adding a quick guide section in a text cell of the notebook.
4. To answer the peer's question, this notebook should be a plug-in-data-and-run process. The user plugs in the trajectory data, all data cleaning and analysis steps have been written out, just to make sure the trajectory dataset includes key attributes like longitude, latitude, timestamp.