Assignment #3

Assignment Due Date: 3/25/19 by 11:59pm

Assignment Deliverables:

You are required to submit a SINGLE WinZip file that has the following deliverables :

1. Documentation for the Angular Components that you created to draw the Line chart
2. Source Code
3. Output report that has ALL captured screen-shots of your assignment run saved in OUTPUT.pdf
4. Video recording of 10 minutes as a demo for the run of your assignment using https://screencast-o-matic.com/

Post your assignment as a SINGLE WIN-ZIP on Blackboard.

Requirements:

Use the ChicagoSocialHub code and d3 in order to add the feature that will allow the user to create the following charts for the divvy stations found on a certain street for the selected restaurant.

1) A Line Chart to plot the number of available docks of the selected divvy station for the past hour, 24 hours, 7 days in green color.
2) The Line Chart must be updated in real-time without a MANUAL refresh
3) The user shall be provided with the choice(select button/drop down list) to view data for the past hour, 24 hours, and 7 days. Initially the past hour data is plotted by default for the user and the user can change that to select 24 hours data or 7 days data.
4) The line chart shall display 30 (past 1 hour divvy data) simple moving average in red color and 720 (past 24 hours divvy data) simple moving average in blue color.
5) The data collected from divvy stations using the provided Python ipynb script must be stored in a table you create on PostgreSQL server with the name divvy_stations_logs

Appendix A - Resources:

- Here are few links that you must visit and run the D3 code examples to learn how to build Angular D3 Charts

  1. Angular-d3-charts: https://github.com/datencia/d3js-angular-examples
  2. d3-charts: https://bl.ocks.org/

- For discussions and usage of moving averages, visit this link https://en.wikipedia.org/wiki/Moving_average

Simple moving average [edit]

In financial applications a **simple moving average** (SMA) is the unweighted mean of the previous *n* data. However, in science and engineering, the mean is normally taken from an equal number of data on either side of a central value. This ensures that variations in the mean are aligned with the variations in the data rather than being shifted in time. An example of a simple equally weighted running mean for a n-day sample of closing price is the mean of the previous *n* days' closing prices. If those prices are $p_M, p_{M-1}, \ldots, p_{M-(n-1)}$ then the formula is

$$\begin{aligned}\bar{p}_{\mathrm{SM}} &= \frac{p_M + p_{M-1} + \cdots + p_{M-(n-1)}}{n} \\ &= \frac{1}{n}\sum_{i=0}^{n-1} p_{M-i}\end{aligned}$$

When calculating successive values, a new value comes into the sum and the oldest value drops out, meaning a full summation each time is unnecessary for this simple case,

$$\bar{p}_{\mathrm{SM}} = \bar{p}_{\mathrm{SM,prev}} + \frac{p_M}{n} - \frac{p_{M-n}}{n}$$