

CS677 HW1

Create a Jupyter notebook CS677_HW1_lastName and add the python code and output cells for the following. Upload the notebook to the Assignments section once completed. **Once one attempt is available to upload.**

Initialize the Dow Jones Industrials dataset as shown below:

```
values = np.loadtxt('http://people.bu.edu/kalathur/datasets/DJI_2018_values.txt')
dates = np.loadtxt('http://people.bu.edu/kalathur/datasets/DJI_2018_dates.txt', dtype='str')
```

- 1) Show the appropriate formatted output for the first five dates and their corresponding values.
- 2) Print the lowest value and the day it occurred in the dataset. Similarly, print the highest value and the day it occurred in the dataset. Use the numpy min, argmin, max, and argmax functions.
- 3) Using day to day differences, show the results for the maximum one-day gain. Output should show the result along with the corresponding dates and values. Similarly, show the results for the maximum one-day loss.
- 4) Show the results here there is at least 500-point gain from the previous day. Output should include the gain, the dates and values of the corresponding day and prior day.
- 5) Use the last four digits of your BU id as the random seed. Pick a random day and examine the 10 consecutive values including that day. Include the condition so that the selection will be the last 10 values if the random day pick is within that period. Show the resulting dates and the values for this period. Show daily next loss/gain for this period. What is the net gain/loss for the period?
- 6) Use the last four digits of your BU id as the random seed. Randomly pick 10 dates in the dataset. Show by ascending order of the dates the selected dates and the corresponding values. Suppose you bought a different stock tied to the DOW on each of these 10 randomly selected dates. Suppose you decided to sell each of that stock later in the year so that you either maximize the gain or minimize the loss. Show for each stock, what date you would have sold? What would have been the gain/loss for each stock? Show the results for each these 10 dates.
- 7) Compute the 20-day simple moving average of the data. Plot the original data and the smoothed data.
- 8) Compute the 20-day weighted moving average using the powers of 2 as the weights (1, 2, 4, 8, 16, etc.) with the recent data having the higher weights. Plot the weighted moving average along with Q7)
- 9) Compute the number of days in which the weighted moving average is higher than the simple moving average. Show the results.