VISUALIZATION - CSC 47400

PROJECT 2 GUIDANCE DOCUMENT –

GENERAL OUTLINE:

1. Methodology to be used – Python for converting Excel to JSON data set
2. The interactive graphics should be using NVD3.js, D3.js or Vega. Tableau can be used but will result in 10% reduction in marks.
3. Code should have built in ability to expand result set if additional data is provided in the excel spreadsheets that are the input data. Similarly. If the Excel is updated the graphics should change accordingly. This can be achieved as follows:
    a. The modified excel will be saved as customary w/o changing file destination.
    b. Have a button called EXECUTE/UPDATE for the graphics so that the ensuing graphs contain modified data set when the button is activated.

OVERALL METHODOLOGY:

5. There are four spreadsheets. Each to be processed the same way as in step 1.
6. TWO of the spreadsheets (Strength or 'S' and Opportunity or 'O)' are to be grouped as Positive Effect. The other two labeled as Weakness or 'W' and Threat or 'T') are grouped as Negative effect.
7. Create a four Quadrants graph with quadrants marked as S, W, O, and T. Label S and O as Positive Effect. Label W and T as negative effect.
8. Each of the Quadrants will have six bars representing Min, Realistic, Max, Avg.,3PT and PERT data points. Make sure to choose distinct colors for all six categories so that each can be differentiated.
9. The set of bars will be showing each category within each of S, W, O and T. (To illustrate in our current data sample there will 3*6 bars for each category.
10. The code to draw visuals should be flexible, meaning that if any data is missing, the related fields will be marked null, but will not break the code and continue to completion. The processing ends only when the end of data file is reached, thus allowing data size flexibility.
11. The second panel of Visuals will be the Summation Data and will have four distinct visuals.
12. In the first the bars represent the summation of all values of the same subcategory for each of S, W, O and T. To illustrate it'll be sum(min), sum(real), sum(max), sum(avg), sum(3PT), sum (PERT).
13. Now create 2nd visual. One set of bars to be labeled as "Positive Effect" and the other set of bars as "Negative Effect." Color choice should be made so that the two sets are visually distinct. A desirable choice is a shade of black for positive and red for Negative. These are the basic colors used by accountants. Then there will be a last set of bars called differential or summation. These will be showing the value of Positive minus Negative.
14. There will be a final Visual in the second panel. This will show the final data set. Three bars in total will be shown. One summation of all Positive (S + O) and (W and T). The last bar will be the differential.

Monte Carlo Analysis:

15. The last set of visuals will be the result of the Monte Carlo simulation. There will be two Gaussian Curves. One resulting from the Positive effects and the second one from the Negative effects. The Monte Carlo analysis will be using the sum(min) of all Positive Effects (S + O) as the lowest and sum(max) of all Positive Effects (S + O) as the highest. Use only 5000-20000 simulations to avoid taking exceptionally long time for your simulation. It is known that you get better result if a much higher number of simulations like one million are used. The second trick is to use only 3-4 decimal places for the random numbers generated for the Monte Carlo simulation. Use of unrestricted length in decimal dramatically slows down the simulation process.

FINAL COMMENT:

16. The above is a guidance document. If anyone can generate the same result set by using a different approach, it's most welcome.

Grading Rubric:

1. 10% for Python coding
2. 60% for Visuals Panels
3. 5% for basic interactive nature meaning ability to dynamically add new data and include the results in the visuals
4. 8% for Visual impact including use of color and choice of labeling
5. 7% for Monte Carlo Analysis
6. 10% for creative ingenuity especially for enhanced interactive nature. An example is to be be able to click on a bar and have it highlighted with the values displayed.
7. BONUS marks of up to a maximum of 5% will be for **extra ordinary eye capturing graphics**.
8. BONUS Marks of up to 10% will be awarded for creating iOS and/or Andriod App.