**Assignment: PBQ-Assignment-Basics of Python programming**

**Instructions to be followed:**

* This assignment exercise is similar to the exercise questions in the "EPAT-04-Python: Basics & Its Quant Ecosystem (PBQ)" module, present with Section 5 from Units 1–18.
* The assignment questions and data files in this unit are available for you to practice using the Jupyter Notebook environment.
* Please note that this assignment is not graded. It provides for purposeful practice and reinforcement of the ideas presented in the given module.

The assignment is based on the PBQ -1 and PBQ-2 sessions (Basics of Python programming). Please provide explanations wherever necessary. You can provide it either as comments or as formatted text (Markdown cells). Programming can be done in many ways so feel free to build your own approach. Read extensively about concepts or methods that you are unfamiliar with or which have not been taught.

**Q1: Write a customized function to calculate the factorial of a number. Do not use any inbuilt functions. Create your own.**

**Q2: Write a Python program which iterates through a sequence of 50 randomly generated integers between 100 and 200, and derive two different series/arrays/lists from it, one which contains even multiples of 3 and the other which contains odd multiples of 5.**

**Hint: You have to use the NumPy library and the % operator in Python.**

**Q3: Write a Python program to generate a sequence of 1000 numbers drawn from a standard uniform distribution and plot it on a chart. Compute its mean. Use the np.where clause to create a sequence of only numbers greater than 0.75 from the list. Plot a chart of those numbers. Check how many such numbers exist. Is it on expected lines? Comment. Please use np.random.seed(1234) at the beginning of your code.**

**Hint: You have to use the NumPy library.**

**Q4: Download the TCS.NS.csv file and read it into your Python environment.**

1. **Which method/function of pandas displays the number of rows and columns? Use it to show the number of rows and columns for the data.**
2. **Use an appropriate method/function of pandas library to get the summary statistics of the data-frame.**
3. **What was the highest price reached by the TCS stock during this period?**

**Q5: For the TCS.NS data downloaded for Q4,**

1. **Fetch all the data from October 2017 using the .loc[] and save it in a new DataFrame called ‘df1’. 'From df1, display only the rows for which the value in the ‘Direction’ column is ‘UP’.**
2. **Add a new column to ‘df1’ containing the daily range (Close - Open) using a vectorized operation.**
3. **Add another column to ‘df1’ containing the 3-day moving average of the Adj Close prices.**
4. **Use the appropriate method to delete all the rows containing NaN values from ‘df1’.**

**Additional Readings:**

Browse through this link: <https://www.python.org/dev/peps/pep-0008/>

It will help you write more readable code.