IE 555 – Programming for Analytics

Homework #3 – Writing Python Functions

Due: The next class period after we finish the first set of notes.
(Exact date will be announced in class)

The purpose of this assignment is to help you gain experience

1. Writing Python functions, and
2. Using GitHub.

Assignment Details

You are asked to provide a single Python script (`.py` file) containing three (3) Python functions:

1. The first function should be named `findChar`. It will accept two (2) inputs:

   - `a` – A string, and
   - `b` – A non-negative integer.

   The `findChar(a, b)` function should return the `b`$^{\text{th}}$ character of string `a` (i.e., a string of size or length 1).

   For example, `findChar('abcdefg', 3)` should return the string 'c'.

2. The second function should be named `doMath`. It will accept three (3) inputs:

   - `c` – A non-negative number (could be int or float),
   - `d` – A string, int, or float value, and
   - `e` – A single-dimensional list (could contain a mix of int, float, and/or string values).

   The `doMath(c, d, e)` function should return a scalar value representing the following:

   $$\texttt{c}^3 + \left\lfloor \frac{\texttt{c}}{0.65} \right\rfloor + x,$$

   where x represents the number of times that the value of input parameter `d` appears in input list `e`.

   For example, `doMath(3, 'w', [1, 'w', 'w', 9])` would return the numeric value of 33. $\left(3^3 + \left\lfloor \frac{3}{0.65} \right\rfloor + 2 = 27 + 4 + 2 = 33\right)$.

3. Finally, the third function should be named `fileInfo`. It will accept one (1) input:

   - `f` – A string representing a filename for a `.csv` file that will be saved in the same directory (folder) as your `.py` script.

The `fileInfo(f)` function should return a list of the form `[rows, cols]`, where `rows` is the number of rows, and `cols` is the number of columns, in file `f`. The `.csv` file will not contain any header rows, and each row will have the same number of columns.

For example, suppose the file '`practice.csv`' contains the following five lines:

$$48, 9.333, 20.5$$
$$12.67, 19.5, 1$$
$$16.5, 49, 2.7525$$
$$41, 10, 14.201$$
$$10, 7.45, 1.5$$

Then `fileInfo('practice.csv')` should return the Python list `[5, 3]`.

These functions should be saved within a file named `UPPERCASEUBUSERID_homework_3.py`, where `UPPERCASEUBUSERID` should be replaced with your UB username in ALL CAPS.

Example Function Inputs/Outputs

As an example, consider a student whose UB username is "xyz123". We would execute that student's functions via an IPython terminal as follows:

```
In  [1]:  import XYZ123_homework_3 as hw3

In  [2]:  response1 = hw3.findChar('qrstuvwxy', 5)
In  [3]:  print(response1)
'u'

In  [4]:  response2 = hw3.doMath(3, 'w', [1, 'w', 'w', 9])
In  [5]:  print(response2)
33

In  [6]:  response3 = hw3.fileInfo('practice.csv')
In  [7]:  print(response3)
[5, 3]
```

Notes

- A file named `practice.csv` has been provided in GitHub. **However**, when we grade your homework, we will use a different file with a different name. **Do not** hard-code `practice.csv` as the filename.
- You should experiment with using different inputs to verify that your code works properly.

Grading

- If you submit properly-working code by the due date, you will have earned 100 points (the maximum score) on this assignment.
- The TA will notify you if your submission has any errors. In such a case, you will need to re-submit your assignment.
  - Each re-submission of your assignment will result in a 10-point deduction.

Submitting Your Assignment

A private GitHub repository will be created for you. Upload your code to the repository and then send an email to the TA when you are finished.