Assignments

Homework 3

Objective
Use Python to create a menu-driven program that uses arithmetic functions with repetition structures.

Problem domain
Create a menu-driven program, calculate a factorial function and a simple addition function.

Prerequisites
Install Python
GitHub account and repository
Install and configure Visual Studio Code

Write Code

In Visual Studio Code, find the /src/homework/d_repetition folder.

a. In the repetition.py folder, using a **for range loop** create function named get_factorial that accepts one parameter num.
b. The function will return the factorial of the num parameter
c. Write the Test for the function (see next section)
d. In the decisions.py folder, using a **while loop** create a function named sum_odd_numbers accepts one parameter num.
e. The function will return the sum of the odd numbers up to the num value.
f. Write the Test for the function (see next section)

Write Unit Test

In Visual Studio Code, find the /tests/homework/d_repetition folder.

a. In the file test_decisions.py add the following code:

```
import unittest
from src.homework.d_repetition.repetition import get_factorial
from src.homework.d_repetition.repetition import sum_odd_numbers
class Test_Config(unittest.TestCase):
```

b. After the line that begins with class write a test case function test_get_factorial for the get_factorial function (Use the homework 2 as a guide to write the test case).
Test that get_factorial with parameter value 4 returns the value 24.
Test that get_factorial with parameter value 5 returns the value 120.
Test that get_factorial with parameter value 6 returns the value 720.

c. Write a test case for the sum_odd_numbers.
Test that sum_odd_numbers with parameter value 7 returns 16

Test that sum_odd_numbers with parameter value 9 returns 25
Test that sum_odd_numbers with parameter value 10 returns 25

Run the Unit Tests

In Visual Studio Code, find the /tests/homework/d_repetition folder

a. From the source code root folder, find the run_tests.py file.
   Replace: `from tests.homework.c_decisions import test_decisions`
   with
   `from tests.homework.d_repetition import tests_repetition`
   Verify that line has the following statement :
   Replace tests_decisions with tests_repetition.
   `suite = unittest.TestLoader().loadTestsFromModule(tests_repetition)`
b. Click on the play button to run the test case.
c. Make sure the test results return ok for the test cases (Fix the code if it fails).

Create and Run the Main Program

In Visual Studio Code, find the /src/homework/d_repetition folder find the main.py file. write code to create a menu as follows. (Remember to convert the keyboard data to int or float!!! and integer and float division)

At the top of the file, write the import decisions statement.

a. Create the following menu:

   Homework 3 Menu
   1-Factorial
   2-Sum odd numbers
   3-Exit

b. If a user select 1,
   a. Prompt the user for a number, remember to convert it to a number with int.
   b. Validate that the number is greater than 0 and less than 10, if not ask the user again for a number.
   c. Call the factorial function

c. If a user selects 2
   a. Prompt the user for a number, convert it to a number.
   b. Validate that the number is greater than 0 and less than 100, if not ask the user again for a number.
   c. Call the sum_odd_numbers function
d. If a user selects 3
   a. Ask them if they want to continue (this can be done in the next step)
e. After each menu selection ask the user if they want to exit.

Upload the Changes to GitHub

a. In Visual Studio Code, click on the Source Control icon .
b. Select only the files pertaining to this assignment.
c. Click on the + to stage the changes.
d. Click on the check mark to commit the changes.
e. From the menu select the …, from the menu select Push.

Submit the Assignment for Grading in Blackboard

Make sure to add your GitHub user name to the Comment edit box.