FANSHAWE
School of Applied
Science & Technology

RANDOM NUMBER GENERATOR

PURPOSE

In this exercise, random values are generated and printed out based on user input request for number of values to generate. User input is also validated to ensure it is within acceptable ranges

OBJECTIVES

After completing this exercise, you should be able to:

- Use for loops in Python to execute repetitive logic in a determinate looping situation
- Use while loops in Python to execute repetitive logic in an indeterminate looping situation
- Use the Random Python library to generate random numbers

PROCEDURE

PREPARE SUBMISSION FILE

1. Create a copy of the submission template called COMP6060**INIT**Lab5.docx where **INIT** is replaced with your own initials. So if your name is John Smith, the document will be called COMP6060**JS**Lab5.docx

PREPARE PYTHON FILE

1. Create a Python file called COMP6060**INIT**Lab5.py where **INIT** is replaced with your own initials. So if your name is John Smith, the document will be called COMP6060**JS**Lab5.py
2. Print out the following to the console, replacing NAME with your name:
   `Welcome to NAME's random number generator!`

PROMPT USER FOR NUMBER OF VALUES TO GENERATE

1. Prompt the user for the number of random values to generate using the following sentence:
   `Please enter the number of values to generate between 1 and 50:`
2. Store the value in a variable called `numValuesStr`
3. Convert `numValuesStr` to an int type, and store in a variable called `numValues`

VALIDATE USER INPUT

1. At the top of the Python file, create a function with the following details:
    a. Name: `getValidUserInput`
    b. Parameters: prompt string, minimum range value, maximum range value
    c. Return: valid integer value within the ranged.
    d. Functionality: **continuously** prompts the user for input using the prompt string parameter. Then it validates whether the value entered by the user is a numeric value. If it is valid, the integer value is returned. If it's not valid, an error message is printed, and the user is re-prompted for the value.
2. Outside the function, after printing the welcome message, call the function `getValidUserInput` with the following parameters:
    a. Please enter the number of values to generate between 1 and 50:
    b. 1
    c. 50

```
60/Lab 5/Lab 5.py"
Welcome to Lynn's random number generator!
Please enter the number of values to generate between 1 and 50: -5
Error: invalid value
Please enter the number of values to generate between 1 and 50: 55
Error: invalid value
Please enter the number of values to generate between 1 and 50: 0
Error: invalid value
```

GENERATING RANDOM NUMBERS

1. To generate truly random numbers, the Python authors provided a useful library called `random`. To make use of this library, add the following line at the very top of your Python file:
   `from random import random`
2. Use a `for` loop to iterate over the range of values from 0 to `numValues` as follows:
   `for num in range(numValues):`
3. Inside the for loop, create a new variable called `randomVal` as follows:
   `randomVal = int( random() * 100 )`
   `random()` is a function that returns a randomly generated number between 0.0 and 0.99. Since we want our random values to be between 0 and 100, we will multiply the decimal values returned by `random()` by 100. This value is a `float`, so we're casting it to an `int`

PRINT RANDOMLY GENERATED NUMBERS

1. Inside the for loop, print the randomly generated value using the following format:
   `{num+1}: {randomVal}`

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EXPECTED OUTPUT

```
60/Lab 5/Lab 5.py"
Welcome to Lynn's random number generator!
Please enter the number of values to generate between 1 and 50: 10
1: 16
2: 16
3: 68
4: 68
5: 62
6: 61
7: 10
8: 80
9: 11
10: 35
```

Show results to Instructor.

Student Name: _____ Instructor: _____

Date: _____