QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY NAWABSHAH
B.S. (CYBER SECURITY)

PROGRAMMING FUNDAMENTALS
Lab Experiment #05

Name: _____
Roll #: _____
Date: _____

OBJECTIVE:
Loops in Python

TOOLS REQUIRED:
Personal computer with windows and Python installed

DESCRIPTION:
In this lab, you will learn and practice loops. Loops are repetitive code structures that help implement tasks that need to be repeated. Python supports `for` and `while` structures. Both looping structures can be nested to generate more complex structures.

The syntax of a for loop in Python is:

```
for count_var in range(lower_bound, upper_bound):
    #statements to repeat
```

Where count_var represents the count variable, which will assume values from lower_bound to upper_bounds during the loop run. Following is an example of a for loop that runs for 10 times. Each iteration will print the value of the count variable i.

```
for i in range(0,10):
     print(i)
```

As a result, values from 0 to 9 will be printed on the screen.

Second loop structure is while loop. It has the following syntax.

```
while test_expression:
    #Body of while
```

Where `test_expression` is a condition specified which as long is evaluated to `True`, the loop runs. The loop stops when the `test_condition` evaluates as `False`.

Please refer to the class presentation for more details about the repetitive structures in Python.

LAB TASK:
1. Open Python IDLE terminal and then create a new file. Name it "lab5_1.py". Write a program that prints numbers from 1 to 100 on the screen

2. Create "lab5_2.py" and write a program that prints only the even numbers from 0 to 100

3. Create “lab5_3.py” and write a program that prints only the odd numbers from 0 to 100

4. Create “lab5_4.py” and write a program that prints the table of a number entered by the user

5. Create “lab5_5.py” and write a program that when runs, reads input typed the user and quits only when user types a ‘q’ character.

6. Create “lab5_6.py” and write a program that computes the factorial of a number entered by the user.

7. Create “lab5_7.py” and write a program that determines whether a number (entered by the user) is prime or not.

8. Create “lab5_8” and write a program that prints divisible numbers of a given number.

9. Create “lab5_9” and write a program that lets user enter 10 (later any number of) numbers and then count how many were odd and even.

10. Create “lab5_10” and write a program that prints Fibonacci series.

QUESTIONS:

Q # 1: Write Python code for a loop that runs infinitely. It only exits when the user presses ‘q’ key

Ans.

Q # 2: Consider the following code. What output will be generated by this code?

```
s = "American Standard Code for Information Interchange"
l = len(s)
i = 0

while i <= l-1:
    if s[i].isupper():
        print(s[i],end="")
        i+=1
    else:
        i+=1
        continue
```

Ans.

Q # 3: Predict the output

```
i = 97
while i <= 121 :
    print("{}-{}".format(chr(i-32),chr(i)))
    i+=6
```

Ans.

Q # 4: Consider the following code. How many times “21 AI” will be printed as the output?

```
for i in range(1,50,4):
    for j in range(1,i+1):
        if(i==j):
            print("21 AI")
```

Ans.
