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

PROGRAMMING FUNDAMENTALS
Lab Experiment #03

Name: _____
Roll #: _____
Date: _____

OBJECTIVE:
Arithmetic, comparison, and logic operators in Python

TOOLS REQUIRED:
Personal computer with windows and Python installed

DESCRIPTION:
This lab experiment provides more examples and practice tasks to understand the arithmetic operations in Python. Furthermore, it introduces with the comparison and logic operators in Python. These operators enable the programmer to integrate complicated control flow and decision-making capabilities in the program.

Table – 1 shows the supported comparison and logic operators in Python.

Table-1

	Operator	Description	Syntax
ARITHMETIC	+	Addition: adds two operands	*x + y*
	–	Subtraction: subtracts two operands	*x – y*
	*	Multiplication: multiplies two operands	*x * y*
	/	Division (float): divides the first operand by the second	*x / y*
	//	Division (floor): divides the first operand by the second	*x // y*
	%	Modulus: returns the remainder when first operand is divided by the second	*x % y*
	**	Power: Returns first raised to power second	*x ** y*
COMPARISON	==	Equal	*x == y*
	!=	Not equal	*x != y*
	>	Greater than	*x > y*
	<	Less than	*x < y*
	>=	Greater than or equal to	*x >= y*
	<=	Less than or equal to	*x <= y*
LOGIC	and	Returns True if both statements are true	*x < 5 and x < 10*
	or	Returns True if one of the statements is true	*x < 5 or x < 4*
	not	Reverse the result, returns False if the result is true	*not(x < 5 and x < 10)*

LAB TASK:

1. Open Python IDLE terminal and then create a new file. Name it "lab3_1.py". Using the input function, take two numbers from the user and store them in variables 'A' and 'B'. Compute the values of performing all the arithmetic operations shown in Table -1 between A and B. Run the program multiple times with different input values. Observe the output. Which of the arithmetic operations

commutative property? (Hint: An operation is commutative if the order of operands does not affect the result e.g., a+b=b+a).

2. Create another file named "lab3_2.py". Write a program that takes three input values from the user i.e., A,B and C. It then computes values of arithmetic operations among A, B, and C. Run the program for multiple values and observe which operations are associative. (Hint: Assoaciticty property states that rearranging operands with parenthesis doesnot affect the output, i.e., a+(b+c) = (a+b)+c.)

3. Create a new Python script and save it as "lab3_3.py". Input two numbers from the user. Then, using the comparison operators from Table-1, print the results using print function for all the comparison operations between both numbers. For example, you can print the result of equal operator (==) using the following print statement.

```
print("A==B is",a==b)
```

The above statement will print the result of *a==b* as either True or False.

4. Create a new Python script named "lab3_4.py". The program asks for two number from the user and then checks whether the numbers are:
    a. Positive
    b. Atleast one of them is positive
    c. Negative
    d. Atleast one of them is negative
    e. Even
    f. Atleast one of them is even
    g. Odd
    h. Atleast one of them is odd
    i. Multiple of 3
    j. Atleast one of them is multiple of 3

Use the print statement similar to the one shown in lab task 3 to display the result

QUESTIONS:

Q # 1: For Lab task 1, write which operators are commutative and which are not.

Ans.

Q # 2: Enlist the operators for lab task 2 that satisfy associative property.

Ans.

Q # 3: Write the output of the following code

```
a=10
b=12
a+=b**2
print(not(a<100)and(b>a))
```

Ans.

Q # 4: Write the output of the following code

```
a=50//3%2**2
b=a**0
print(not(a<b and a==0))
```

Ans.