**Lab # 3**

* **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?**

**Answer:** A+B = B+A and A\*B=B\*A is Communitive property.

A = float(input(“Enter the first number (A): “))

B = float(input(“Enter the second number (B): “))

Addition = A + B

Subtraction = A – B

Multiplication = A \* B

Division = A / B

Modulo = A % B

Exponentiation = A \*\* B

Print(“Addition:”, addition)

Print(“Subtraction:”, subtraction)

Print(“Multiplication:”, multiplication)

Print(“Division:”, division)

Print(“Modulo:”, modulo)

Print(“Exponentiation:”, exponentiation)

* **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: Associative property states that Rearranging operands with parenthesis does not affect the output, i.e., a+(b+c) = (a+b)+c. )**

**Answers:**

A = float(input("Enter the first number (A): "))

B = float(input("Enter the second number (B): "))

C = float(input("Enter the third number (C): "))

addition\_1 = A + (B + C) # a + (b + c)

addition\_2 = (A + B) + C # (a + b) + c

multiplication\_1 = A \* (B \* C) # a \* (b \* c)

multiplication\_2 = (A \* B) \* C # (a \* b) \* c

print("Addition (a + (b + c)):", addition\_1)

print("Addition ((a + b) + c):", addition\_2)

print("Multiplication (a \* (b \* c)):", multiplication\_1)

print("Multiplication ((a \* b) \* c):", multiplication\_2)

* **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.**

**Answer:**

A = float(input(“Enter the first number (A): “))

B = float(input(“Enter the second number (B): “))

print(“A == B is”, A == B)

print(“A != B is”, A != B)

print(“A < B is”, A < B)

print(“A > B is”, A > B)

print(“A <= B is”, A <= B)

print(“A >= B is”, A >= B)

* **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:**
* **Positive**
* **At least one of them is positive**
* **Negative**
* **At least one of them is negative**
* **Even**
* **At least one of them is even**
* **Odd**
* **At least one of them is odd**
* **Multiple of 3**
* **At least one of them is multiple of 3**

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

**Answer:**

Num1 = float(input(“Enter the first number: “))

Num2 = float(input(“Enter the second number: “))

print(“a. Both numbers are positive:”, num1 > 0 and num2 > 0)

print(“b. At least one number is positive:”, num1 > 0 or num2 > 0)

print(“c. Both numbers are negative:”, num1 < 0 and num2 < 0)

print(“d. At least one number is negative:”, num1 < 0 or num2 < 0)

print(“e. Both numbers are even:”, num1 % 2 == 0 and num2 % 2 == 0)

print(“f. At least one number is even:”, num1 % 2 == 0 or num2 % 2 == 0)

print(“g. Both numbers are odd:”, num1 % 2 != 0 and num2 % 2 != 0)

print(“h. At least one number is odd:”, num1 % 2 != 0 or num2 % 2 != 0)

print(“i. Both numbers are multiples of 3:”, num1 % 3 == 0 and num2 % 3 == 0)

print(“j. At least one number is a multiple of 3:”, num1 % 3 == 0 or num2 % 3 == 0)

**Questions**

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

**Ans**.

Commutative operators:

Addition (A + B = B + A)

Multiplication (A \* B = B \* A)

Non-commutative operators:

Subtraction (A - B ≠ B - A)

Division (A / B ≠ B / A)

Exponentiation (A \*\* B ≠ B \*\* A)

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

**Ans**.

Addition: (A + (B + C)) = ((A + B) + C)

Multiplication: (A \* (B \* C)) = ((A \* B) \* C)

**Q # 3: Write the output of the following code**

a=10

b=12

a+=b\*\*2

print(not(a<100)and(b>a))

**Ans**. False

**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**. False

**Lab # 4**

* **a program that inputs a number and then determines whether the entered number is odd, even or 0.**

**Answer:**

Number = int(input(“Enter a number: “))

If number == 0:

print(“The entered number is 0.”)

elif number % 2 == 0:

print(“The entered number is even.”)

else:

print(“The entered number is odd.”)

* **Write a program that asks for a character to be entered by the user. Then the Program checks whether the entered character is a vowel or consonant.**

Answer:

Character = input(“Enter a character: “)

If character.lower() in [‘a’, ‘e’, ‘I’, ‘o’, ‘u’]:

print(“The entered character is a vowel!”)

else:

print(“The entered character is a consonant!”)

* **Write a program that asks for a person’s age, employment status, marital status And then determines the insurance plan according to the following table.**

**Answer:**

Age = int(input(“Enter age: “))

Employment\_status = input(“Enter Employment Status: “)

Marital\_status = input(“Enter Marital Status: “)

If age < 25:

print(“Not Allowed”)

elif age < 40 and employment\_status == “Unemployed” and marital\_status == “unmarried”:

print(“Insurance is 1400 PKR/month”)

elif age < 40 and employment\_status == “Employed” and marital\_status == “unmarried”:

print(“Insurance is 800 PKR/month”)

elif age < 40 and employment\_status == “Unemployed” and marital\_status == “married”:

print(“Insurance is 1200 PKR/month”)

elif age < 40 and employment\_status == “Employed” and marital\_status == “married”:

print(“Insurance is 1000 PKR/month”)

elif age >= 40 and employment\_status != “any” and marital\_status != “any”:

print(“Insurance is 1500 PKR/month”)

else:

print(“Insurance Plan”)

* **Write a program that inputs users obtained marks. The program must calculate his grade according to the following rules:**

**<40: Fail**

**41-50: ‘D’ grade**

**51-60: ‘C’ grade**

**61-70: ‘B’ grade**

**71-80: ‘A’ grade**

**>81: ‘A-1’ grade**

**Answer:**

Marks = int(input(“Enter your obtained marks: “))

If marks < 40:

Grade = “Fail”

Elif marks <= 50:

Grade = “D”

Elif marks <= 60:

Grade = “C”

Elif marks <= 70:

Grade = “B”

Elif marks <= 80:

Grade = “A”

Else:

Grade = “A-1”

Print(“Your grade is:”, grade)

**Questions**

**Q # 1: Consider the following code: What will be the output?**

x = 0

a = 5

b = 5

if a > 0:

if b < 0:

x = x + 5

elif a > 5:

x = x + 4

else:

x = x + 3

else:

x = x + 2

print(x)

**Ans**: 3

**Q # 2: Which one of the following is a valid Python if statement :**

A. if a>=2:

B. if (a >= 2)

C. if (a => 22)

D. if a >= 22

**Ans**. D. if a >= 22

**Q # 3: Which statement will check if a is equal to b?**

A. if a = b:

B. if a == b:

C. if a === c:

D. if a == b

**Ans**. B. if a == b: