

# Assignment-04-(b)

December 6, 2024

## 1 Assignment#4: Loops

### 1.1 Question(1):

Write a Python program to print the numbers from 1 to 10 using a for loop.

```
[2]: for n in range(1,11):  
      print(n)
```

```
1  
2  
3  
4  
5  
6  
7  
8  
9  
10
```

### 1.2 Question(2):

Write a Python program to print the numbers from 20 to 1 using a while loop.

```
[44]: a=20  
      while a>0:  
          print(a)  
          a-=1
```

```
20  
19  
18  
17  
16  
15  
14  
13  
12  
11
```

10  
9  
8  
7  
6  
5  
4  
3  
2  
1

### 1.3 Question(3):

Write a program to print even numbers from 1 to 10.

```
[48]: for a in range(2,11,2):  
       print(a)
```

2  
4  
6  
8  
10

```
[49]: a=2  
       while a<11:  
           print(a)  
           a+=2
```

2  
4  
6  
8  
10

### 1.4 Question(4):

Write a program that prompts the user to enter a number n and prints all the numbers from 1 to n.

```
[57]: n = int(input("Enter the number:"))  
       d = int(input("How many want to make difference in loop:"))  
  
       start=1  
       if n>0:  
           while start<=n:  
               print(start)  
               start+=d  
       elif n<0:
```

```

    while start>=n:
        print(start)
        start-=d
else:
    print("invalid input!!!")

```

Enter the number: 10  
How many want to make difference in loop: 2

1  
3  
5  
7  
9

### 1.5 Question(5):

Write a program that prompts the user to enter a number n, and then prints all the odd numbers between 1 and n.

```

[58]: n = int(input("Enter the number:"))

start=1
if n>0:
    while start<=n:
        print(start)
        start+=2
elif n<0:
    while start>=n:
        print(start)
        start-=2
else:
    print("invalid input!!!")

```

Enter the number: 20

1  
3  
5  
7  
9  
11  
13  
15  
17  
19

### 1.6 Question(6):

Write a program that prints 'Happy Birthday!' five times on screen

```
[6]: a = 1
      while a<6:
          print("Happy Birthday!")
          a+=1
```

Happy Birthday!  
Happy Birthday!  
Happy Birthday!  
Happy Birthday!  
Happy Birthday!

```
[12]: for n in range(1,6):
        print("Happy Birthday!")
```

Happy Birthday!  
Happy Birthday!  
Happy Birthday!  
Happy Birthday!  
Happy Birthday!

### 1.7 Question(7):

Write a program that takes a number n as input from the user and generates the first n terms of the series formed by squaring the natural numbers.

```
[14]: n = int(input("Enter the number:"))
      print(f"The first {n} terms of the series are:")

      for a in range(1,n+1):
          print(a*a)
```

Enter the number: 5

The first 5 terms of the series are:

1  
4  
9  
16  
25

```
[15]: n = int(input("Enter the number:"))
      print(f"The first {n} terms of the series are:")

      i=0
      while i<n:
          i+=1
          print(i*i)
```

Enter the number: 5

The first 5 terms of the series are:

1  
4  
9  
16  
25

### 1.8 Question(8):

Write a program that prompts the user to input a number and prints its multiplication table.

```
[19]: n = int(input("Enter the number:"))  
print(f"The Table of {n} is:")  
for i in range(1,11):  
    print(n,"*",i,"=",n*i)
```

Enter the number: 6

The Table of 6 is:

6 \* 1 = 6  
6 \* 2 = 12  
6 \* 3 = 18  
6 \* 4 = 24  
6 \* 5 = 30  
6 \* 6 = 36  
6 \* 7 = 42  
6 \* 8 = 48  
6 \* 9 = 54  
6 \* 10 = 60

```
[22]: n = int(input("Enter the number:"))  
print(f"The Table of {n} is:")  
  
i=1  
while i<11:  
    print(n,"*",i,"=",n*i)  
    i+=1
```

Enter the number: 6

The Table of 6 is:

6 \* 1 = 6  
6 \* 2 = 12  
6 \* 3 = 18  
6 \* 4 = 24  
6 \* 5 = 30  
6 \* 6 = 36  
6 \* 7 = 42  
6 \* 8 = 48

6 \* 9 = 54  
6 \* 10 = 60

### 1.9 Question(9):

Write a Python program to print the first 8 terms of an arithmetic progression starting with 3 and having a common difference of 4. The program should output the following sequence: 3 7 11 15 19 23 27 31

```
[34]: a = int(input("Enter start of number number:"))
      b = int(input("Enter the total terms for arithmetic progression:"))
      c = int(input("Enter value for common difference:"))

      i=1
      for i in range(i,b+1):
          print(a)
          a+=c
```

```
Enter start of number number: 3
Enter the total terms for arithmetic progression: 8
Enter value for common difference: 4

3
7
11
15
19
23
27
31
```

### 1.10 Question(10):

Write a Python program to print the first 6 terms of a geometric sequence starting with 2 and having a common ratio of 3. The program should output the following sequence: 2 6 18 54 162 486

```
[38]: a = int(input("Enter start of number number:"))
      b = int(input("Enter the total terms for geometric sequence:"))
      c = int(input("Enter value for common ratio:"))

      i=1
      for i in range(i,b+1):
          print(a)
          a*=c
```

```
Enter start of number number: 2
Enter the total terms for geometric sequence: 6
Enter value for common ratio: 3
```

2  
6  
18  
54  
162  
486

### 1.11 Question(11):

Write a program that asks the user for a positive integer value. The program should calculate the sum of all the integers from 1 up to the number entered. For example, if the user enters 20, the loop will find the sum of 1, 2, 3, 4, ... 20.

```
[54]: n = int(input("Enter the number:"))

      sums =0
      for i in range(1,n+1):
          sums+=i

      print(sums)
```

Enter the number: 20

210

### 1.12 Question(12):

write a program that takes a positive integer N as input and calculates the sum of the reciprocals of all numbers from 1 up to N. The program should display the final sum.

```
[56]: n = int(input("Enter the number:"))

      sums =0
      for i in range(1,n+1):
          sums+=1/i

      print(round(sums,2))
```

Enter the number: 5

2.28

### 1.13 Question(13):

Write a program that prompts the user to enter a number and repeats this process 5 times. The program should accumulate the numbers entered and then display the final running total. Sample Output: Enter a number: 10 Enter a number: 15 Enter a number: 35 Enter a number: 40 Enter a number: 50 The final running total is: 150

```
[59]: sum_nums = 0

for n in range(1,6):
    nums=int(input("Enter the number:"))
    sum_nums+=nums

print(f"The final running total is: {sum_nums}")
```

Enter the number: 10

Enter the number: 15

Enter the number: 35

Enter the number: 40

Enter the number: 50

The final running total is: 150

### 1.14 Question(14):

Write a program that prompts the user to enter a positive integer and calculates its factorial. The factorial of a positive integer 'n' is denoted as 'n!' and is calculated by multiplying all the integers from 1 to 'n' together. For example, the factorial of 5 (denoted as 5!) is calculated as 1 x 2 x 3 x 4 x 5.

The program should display the factorial value if the input is a positive number, or display a message stating that the factorial does not exist for negative numbers. Additionally, for an input of zero, the program should output that the factorial of 0 is 1.

```
[72]: n=int(input("Enter the number for factorial:"))
fact_sum = 1

if n==0:
    print(f"The factorial of {n} is: 1")
elif n<0:
    print("factorial does not exist for negative numbers!!!")
elif n>0:
    for i in range(1,n+1):
        fact_sum*=i
    print(f"The factorial of {n} is : {fact_sum}")
else:
    print("Valid Input!!!")
```

Enter the number for factorial: 10

The factorial of 10 is : 3628800

### 1.15 Question(15):

Write a Python program that prompts the user to enter a base number and an exponent, and then calculates the power of the base to the exponent. The program should not use the exponentiation operator (\*\*) or the math.pow() function. The program should handle both positive and negative exponents.



```
[82]: base = int(input("Enter the value of base:"))
      exp = int(input("Enter the value of exponent:"))

      ans=1

      for i in range(exp):
          ans*=base

      print(ans)
```

Enter the value of base: 2

Enter the value of exponent: 5

32

```
[ ]:
```