**Python if else, for loop, and range() Exercises**

**This Python loop exercise include the following: –**

* **It contains 18 programs to solve using if-else statements and looping techniques.**
* **This exercise is nothing but an assignment to solve, where you can solve and practice different loop programs and challenges.**

**Exercise 1: Print First 10 natural numbers using while loop**

**Expected output:**

1

2

3

4

5

6

7

8

9

10

 Ans)

# program 1: Print first 10 natural numbers

i = 1

**while** i <= 10:

**print**(i)

i += 1

**Exercise 2: Print the following pattern**

Write a program to print the following number pattern using a loop.

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

Ans) **print**("Number Pattern ")

# Decide the row count. (above pattern contains 5 rows)

row = 5

# start: 1

# stop: row+1 (range never include stop number in result)

# step: 1

# run loop 5 times

**for** i **in** **range**(1, row + 1, 1):

# Run inner loop i+1 times

**for** j **in** **range**(1, i + 1):

**print**(j, end=' ')

# empty line after each row

**print**("")

**Exercise 3: Calculate the sum of all numbers from 1 to a given number**

Write a program to accept a number from a user and calculate the sum of all numbers from 1 to a given number

For example, if the user entered **10** the output should be **55** (1+2+3+4+5+6+7+8+9+10)

**Expected Output**:

Enter number 10

Sum is:  55

 Ans)

# s: store sum of all numbers

s = 0

n = **int**(**input**("Enter number "))

# run loop n times

# stop: n+1 (because range never include stop number in result)

**for** i **in** **range**(1, n + 1, 1):

# add current number to sum variable

s += i

**print**("\n")

**print**("Sum is: ", s)

**Exercise 4: Write a program to print multiplication table of a given number**

For example, num = 2 so the output should be

2

4

6

8

10

12

14

16

18

20

 Ans) n = 2

# stop: 11 (because range never include stop number in result)

# run loop 10 times

**for** i **in** **range**(1, 11, 1):

# 2 \*i (current number)

product = n \* i

**print**(product)

**Exercise 5: Display numbers from a list using loop**

Write a program to display only those numbers from a [list](https://pynative.com/python-lists/) that satisfy the following conditions

* The number must be divisible by five
* If the number is greater than 150, then skip it and move to the next number
* If the number is greater than 500, then stop the loop

**Given**:

numbers = [12, 75, 150, 180, 145, 525, 50]

**Expected output:**

75

150

145

 Ans)

 numbers = [12, 75, 150, 180, 145, 525, 50]

# iterate each item of a list

**for** item **in** numbers:

**if** item > 500:

**break**

**elif** item > 150:

**continue**

# check if number is divisible by 5

**elif** item % 5 == 0:

**print**(item)

**Exercise 6: Count the total number of digits in a number**

Write a program to count the total number of digits in a number using a while loop

For example, the number is **75869**, so the output should be **5**.

 Ans)

num = 75869

count = 0

**while** num != 0:

# floor division

# to reduce the last digit from number

num = num // 10

# increment counter by 1

count = count + 1

**print**("Total digits are:", count)

**Exercise 7: Print the following pattern**

Write a program to use for loop to print the following reverse number pattern

5 4 3 2 1

4 3 2 1

3 2 1

2 1

1

 Ans)

**n = 5**

**k = 5**

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

**for j in range(k-i,0,-1):**

**print(j,end=' ')**

**print()**

**Exercise 8: Print list in reverse order using a loop**

**Given**:

list1 = [10, 20, 30, 40, 50]

**Expected output:**

50

40

30

20

10

 Ans)

list1 = [10, 20, 30, 40, 50]

# reverse list

new\_list = **reversed**(list1)

# iterate reversed list

**for** item **in** new\_list:

**print**(item)

**Exercise 9: Display numbers from -10 to -1 using for loop**

**Expected output:**

-10

-9

-8

-7

-6

-5

-4

-3

-2

-1

 Ans) **for** num **in** **range**(-10, 0, 1):

**print**(num)

**Exercise 10: Use else block to display a message “Done” after successful execution of for loop**

For example, the following loop will execute without any error.

**Given**:

for i in range(5):

    print(i)

**Expected output:**

0

1

2

3

4

Done!

Ans)

**for** i **in** **range**(5):

**print**(i)

**else**:

**print**("Done!")

**Exercise 11: Write a program to display all prime numbers within a range**

**Note**: A Prime Number is a number that cannot be made by multiplying other whole numbers. A prime number is a natural number greater than 1 that is not a product of two smaller natural numbers

**Examples**:

* 6 is not a prime mumber because it can be made by 2×3 = 6
* 37 is a prime number because no other whole numbers multiply together to make it.

**Given**:

# range

start = 25

end = 50

**Expected output:**

Prime numbers between 25 and 50 are:

29

31

37

41

43

47

Ans)

start = 25

end = 50

**print**("Prime numbers between", start, "and", end, "are:")

**for** num **in** **range**(start, end + 1):

# all prime numbers are greater than 1

# if number is less than or equal to 1, it is not prime

**if** num > 1:

**for** i **in** **range**(2, num):

# check for factors

**if** (num % i) == 0:

# not a prime number so break inner loop and

# look for next number

**break**

**else**:

**print**(num)

**Exercise 12: Display Fibonacci series up to 10 terms**

The Fibonacci Sequence is a series of numbers. The next number is found by adding up the two numbers before it. The **first two numbers are 0 and 1**.

For example, 0, 1, 1, 2, 3, 5, 8, 13, 21. The next number in this series above is 13+21 = 34.

**Expected output:**

Fibonacci sequence:

0  1  1  2  3  5  8  13  21  34

Ans)

# first two numbers

num1, num2 = 0, 1

**print**("Fibonacci sequence:")

# run loop 10 times

**for** i **in** **range**(10):

# print next number of a series

**print**(num1, end=" ")

# add last two numbers to get next number

res = num1 + num2

# update values

num1 = num2

num2 = res

**Exercise 13: Find the factorial of a given number**

Write a program to use the loop to find the factorial of a given number.

The factorial (symbol: !) means to multiply all whole numbers from the chosen number down to 1.

**For example**: calculate the factorial of 5

5! = 5 × 4 × 3 × 2 × 1 = 120

**Expected output:**

120

Ans)

num = 5

factorial = 1

**if** num < 0:

**print**("Factorial does not exist for negative numbers")

**elif** num == 0:

**print**("The factorial of 0 is 1")

**else**:

# run loop 5 times

**for** i **in** **range**(1, num + 1):

# multiply factorial by current number

factorial = factorial \* i

**print**("The factorial of", num, "is", factorial)

**Exercise 14: Reverse a given integer number**

**Given**:

76542

**Expected output:**

24567

Ans)

 num = 76542

reverse\_number = 0

**print**("Given Number ", num)

**while** num > 0:

reminder = num % 10

reverse\_number = (reverse\_number \* 10) + reminder

num = num // 10

**print**("Revere Number ", reverse\_number)

**Exercise 15: Use a loop to display elements from a given list present at odd index positions**

**Given:**

my\_list = [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]

**Note**: list index always starts at 0

**Expected output:**

20 40 60 80 100

 Ans)

my\_list = [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]

# stat from index 1 with step 2( means 1, 3, 5, an so on)

**for** i **in** my\_list[1::2]:

**print**(i, end=" ")

**Exercise 16: Calculate the cube of all numbers from 1 to a given number**

Write a program to rint the cube of all numbers from 1 to a given number

**Given**:

input\_number = 6

**Expected output:**

Current Number is : 1  and the cube is 1

Current Number is : 2  and the cube is 8

Current Number is : 3  and the cube is 27

Current Number is : 4  and the cube is 64

Current Number is : 5  and the cube is 125

Current Number is : 6  and the cube is 216

 Ans)

input\_number = 6

**for** i **in** **range**(1, input\_number + 1):

**print**("Current Number is :", i, " and the cube is", (i \* i \* i))

**Exercise 17: Find the sum of the series upto n terms**

Write a program to calculate the sum of series up to n term. For example, if n =5 the series will become 2 + 22 + 222 + 2222 + 22222 = 24690

**Given**:

# number of terms

n = 5

**Expected output:**

24690

Ans)

n = 5

# first number of sequence

start = 2

sum\_seq = 0

# run loop n times

**for** i **in** **range**(0, n):

**print**(start, end="+")

sum\_seq += start

# calculate the next term

start = start \* 10 + 2

**print**("\nSum of above series is:", sum\_seq)

**Exercise 18: Print the following pattern**

Write a program to print the following start pattern using the for loop

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

Ans)

rows = 5

**for** i **in** **range**(0, rows):

**for** j **in** **range**(0, i + 1):

**print**("\*", end=' ')

**print**("\r")

**for** i **in** **range**(rows, 0, -1):

**for** j **in** **range**(0, i - 1):

**print**("\*", end=' ')

**print**("\r")