ARKADIPTA MOJUMDER

REGISTRATION NUMBER- 22MCA0201

LAB ASSESMENT 1- PYTHON PROGRAMMING(ITA6017)

1.Print the following pattern using for loop

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

Solution-

```
for i in range(1, 6):
    for j in range(1, i+1):
        print(j, end=' ')
    print()
```

Output-

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
PS U:\Python-Winter Semester-VIT 2023>
```

2. Write a program to count the total number of digits in a number and also sum the value
using while loop.

Solution-

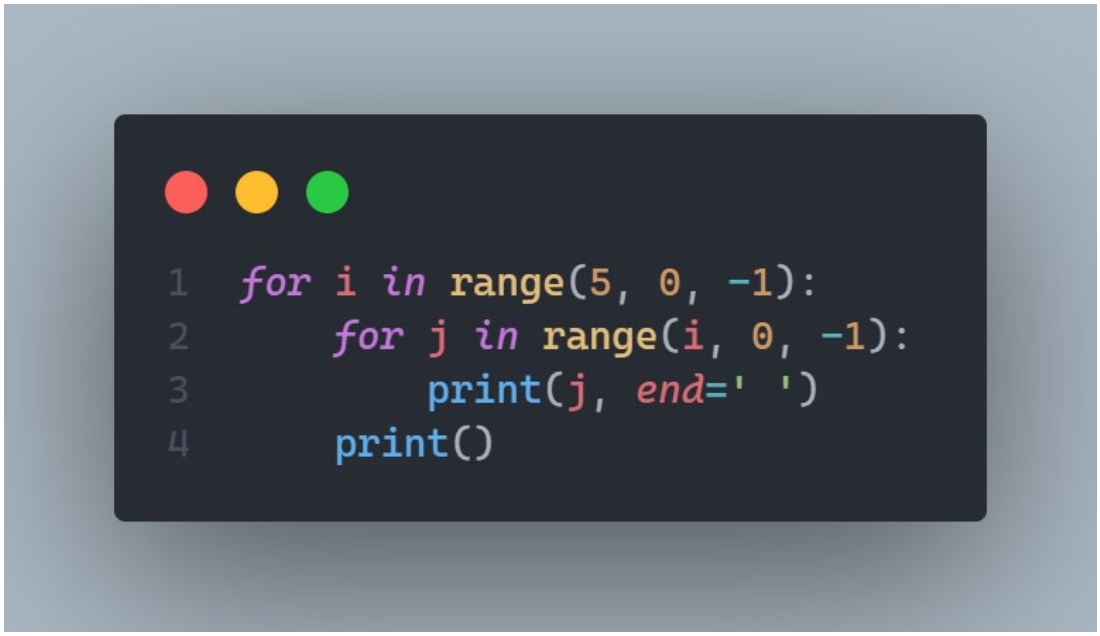
```python
num = int(input("Enter a number: "))
total_digits = 0
digit_sum = 0

while num > 0:
    digit = num % 10
    total_digits += 1
    digit_sum += digit
    num //= 10

print("Total digits:", total_digits)
print("Digit sum:", digit_sum)

```

Output-

```
Enter a number: 56
Total digits: 2
Digit sum: 11
PS U:\Python-Winter Semester-VIT 2023>
```

3. Print the following pattern using for loop
5 4 3 2 1
4 3 2 1
3 2 1
2 1

Solution-



```python
for i in range(5, 0, -1):
    for j in range(i, 0, -1):
        print(j, end=' ')
    print()
```

Output-

```
5 4 3 2 1
4 3 2 1
3 2 1
2 1
1
PS U:\Python-Winter Semester-VIT 2023>
```

4. Find the sum of series up to n term using loop.
if n =5 , series=2 the series will become 2 + 22 + 222 + 2222 + 22222 = 24690.

Solution-

```python
n =int(input("Enter number of terms in series: "))
series = int(input("Enter starting value of the series: "))
sum = 0

#loop to print the series
start = series
sum1 = 0;
for i in range(0, n):
    print(start, end = " ")
    sum1 += start
    start = (start * 10) + series

print("\n")

# loop to calculate the sum of the series
for i in range(n):
    term = int(str(series) * (i+1))
    sum += term

print("Sum of the series:", sum)
```

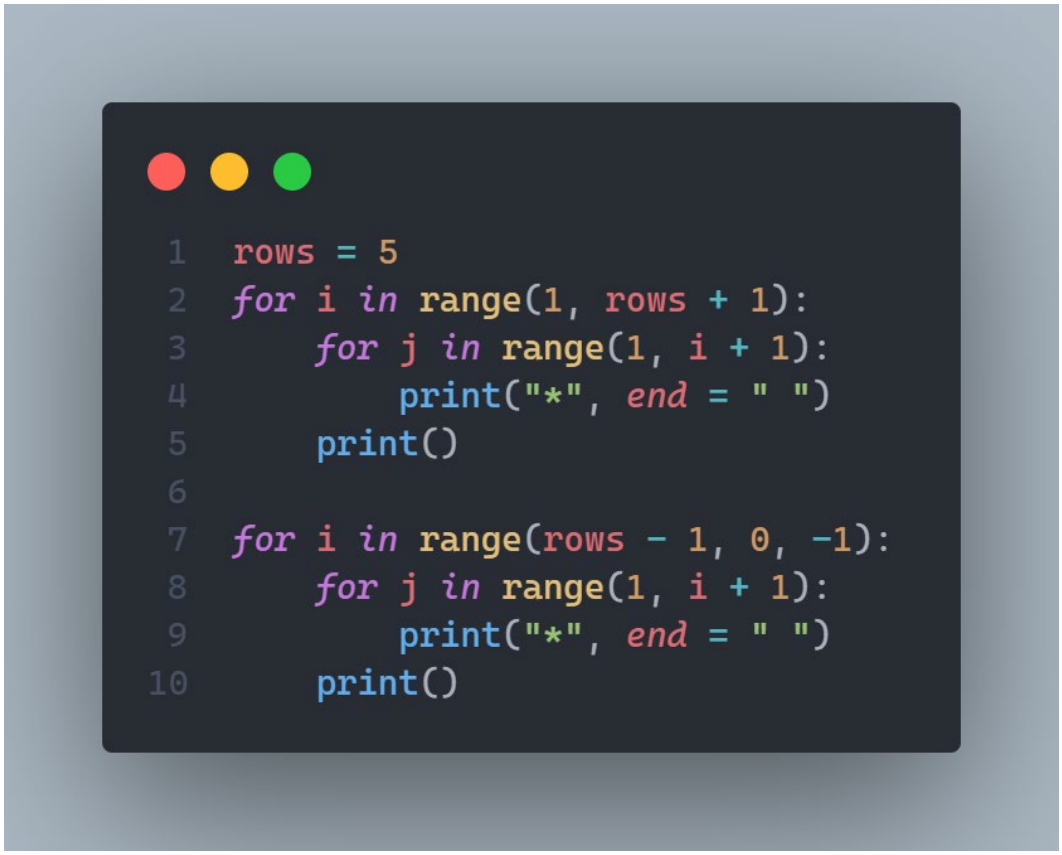
Output-

```
Enter number of terms in series: 5
Enter starting value of the series: 2
2 22 222 2222 22222

Sum of the series: 24690
PS U:\Python-Winter Semester-VIT 2023>
```

5. Print the following pattern using for loop

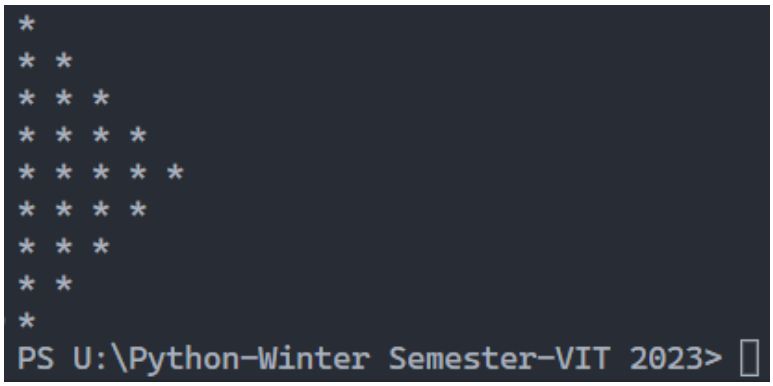
```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

Solution-



```python
rows = 5
for i in range(1, rows + 1):
    for j in range(1, i + 1):
        print("*", end = " ")
    print()

for i in range(rows - 1, 0, -1):
    for j in range(1, i + 1):
        print("*", end = " ")
    print()
```

Output-



```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
PS U:\Python-Winter Semester-VIT 2023>
```

6. Scenario Two trains are on same track and they are coming towards each other. The speed of the first train is 50 km/h and the speed of the second train is 70 km/h. A bee starts flying between the trains when the distance between two trains is 100 km. The bee first flies from first train to second train. Once it reaches the second train, it immediately flies back to the first train … and so on until trains collide. Calculate the total distance travelled by the bee. Speed of bee is 80 km/h. Calculate the Time Taken by the Trains to collide in minutes.

Solution-

```python
v1 = 50 #speed of train 1 in km/h
v2 = 70 #speed of train 2 in km/h
vb = 80 #speed of bee in km/h
d = 100 #distance between train
# time taken for trains to collide in hours
t = d / (v1 + v2)
# total distance travelled by bee
db = vb * t
print("Total distance travelled by the bee in time till the collision:", db, "km")
# conversion in minutes
time_in_minutes = t * 60
print("Time taken for the trains to collide in minutes :", time_in_minutes, "minutes")
```

Output-

```
Total distance travelled by the bee in time till the collision: 66.66666666666667 km
Time taken for the trains to collide in minutes : 50.0 minutes
PS U:\Python-Winter Semester-VIT 2023>
```

7.Solve the following puzzle from range 1 - 10

1 + 1 + 1 = 41
2 + 2 + 2 = 142
3 + 3 + 3 = 363
4 + 4+ 4 = 764

Solution-

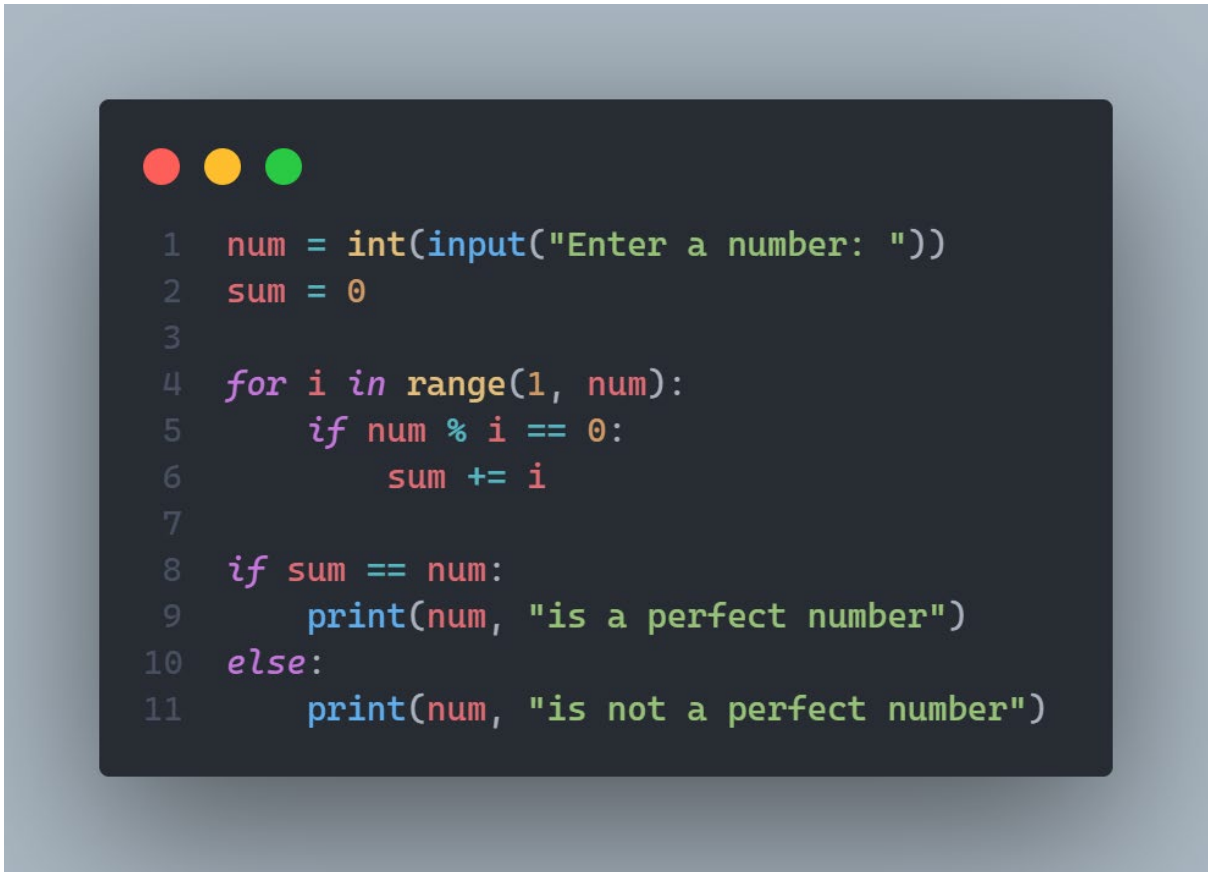
```
i=0

for i in range(1,11):
  p=pow(i,3)+3*i

  print(i,"+",i,"+",i,"=",str(p)+str(i))
```

Output-

```
1 + 1 + 1 = 41
2 + 2 + 2 = 142
3 + 3 + 3 = 363
4 + 4 + 4 = 764
5 + 5 + 5 = 1405
6 + 6 + 6 = 2346
7 + 7 + 7 = 3647
8 + 8 + 8 = 5368
9 + 9 + 9 = 7569
10 + 10 + 10 = 103010
PS U:\Python-Winter Semester-VIT 2023>
```

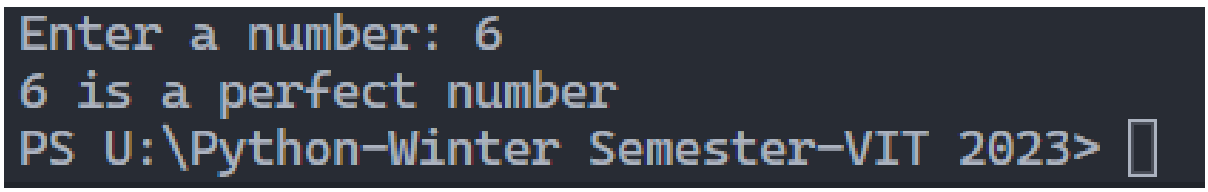
8. Check whether the given no is perfect number or not
For example: Sum of the proper divisors of 6 is 1 + 2 + 3 = 6, which is a perfect number.

Solution-



```python
num = int(input("Enter a number: "))
sum = 0

for i in range(1, num):
    if num % i == 0:
        sum += i

if sum == num:
    print(num, "is a perfect number")
else:
    print(num, "is not a perfect number")
```

Output-



```
Enter a number: 6
6 is a perfect number
PS U:\Python-Winter Semester-VIT 2023>
```