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

In [1]:
```
for a in range(1,11):
    print(a)
```

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

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

In [3]:
```
#using for loop
for a in range(20,0,-1):
    print(a)
```

```
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
```

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

In [5]:
```
for a in range(0,11,2):
    print(a)
```

```
0
2
4
6
8
10
```

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

In [10]:
```
num=int(input("Enter any integer:"))
for a in range(1,num+1):
    print(a)
```

```
1
2
3
4
5
6
7
8
9
10
11
12
13

14
15
16
17
18
19
20
```

5. Write a program that prompts the user to enter a number n, and then prints all the

odd numbers between 1 and n.

In [21]:
```
num=int(input("Enter any integer:"))
for a in range(1,num+1):
     if a % 2 != 0:
        print(a)
```

```
1
3
5
7
9
11
13
15
17
19
```

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

In [23]:
```
for a in range(0,10):
    print("Happy Birthday")
```

```
Happy Birthday
Happy Birthday
Happy Birthday
Happy Birthday
Happy Birthday
Happy Birthday
Happy Birthday
Happy Birthday
Happy Birthday
Happy Birthday
```

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.

In [28]:
```
num=int(input("Enter any integer:"))
for a in range(1,num+1):
    print(f"The first {num} terms of the series are:{a*a}")
```

```
The first 10 terms of the series are:1
The first 10 terms of the series are:4
The first 10 terms of the series are:9
The first 10 terms of the series are:16
The first 10 terms of the series are:25
The first 10 terms of the series are:36
The first 10 terms of the series are:49
The first 10 terms of the series are:64
The first 10 terms of the series are:81

The first 10 terms of the series are:100
```

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

In [31]:
```
num=int(input("Enter any integer:"))
print(f"The Multiplication table of {num} is:\n")
for a in range(1,11):
    print(f"{num} x {a} = {a*num}")
```

```
The Multiplication table of 12 is:

12 x 1 = 12
12 x 2 = 24
12 x 3 = 36
12 x 4 = 48
12 x 5 = 60
12 x 6 = 72
12 x 7 = 84
12 x 8 = 96
12 x 9 = 108
12 x 10 = 120
```

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

In [35]:
```
for a in range(3,35,4):
    print(f"{a}",end=" ")
```

```
3 7 11 15 19 23 27 31
```

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

In [75]:
```
first_term=2
common_ratio=3
nth_term=6
for a in range(nth_term):
    term=first_term*(common_ratio**a)
    print(term)
```

```
2
6
18
54
162
486
```

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.

In [37]:
```
num=int(input("Enter any integer:"))
for a in range(1,num+1):
    print(a,end=" ")
```

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

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.

In [64]:
```
num=int(input("Enter any integer:"))
reci = 0
for a in range(1,num+1):
    reci += 1/a
print(f"The reciprocals of 1 to {num} is {reci}")
```

```
The reciprocals of 1 to 5 is 2.283333333333333
```

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

In [63]:
```
repeat=int(input("how many times do you want to repeat this program:"))
total_sum = 0
for a in range(0,repeat):
    number=int(input("Enter a number:"))
    total_sum += number
print(f"The sum of all input numbers are = {total_sum}")
```

```
The sum of all input numbers are = 150
```

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

In [72]:
```
num=int(input("Enter any number:"))
factorial = 1
for a in range(1,num+1):
    factorial*=a
print(f"The factorial of {num} is = {factorial}")
```

```
The factorial of 8 is = 40320
```

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.

In [77]:
```
num=int(input("Enter any base number:"))
ex=int(input("Enter its exponent:"))
result=1
for a in range(1,ex+1):
    result*=num
print(result)
```

```
27
```

In [ ]: