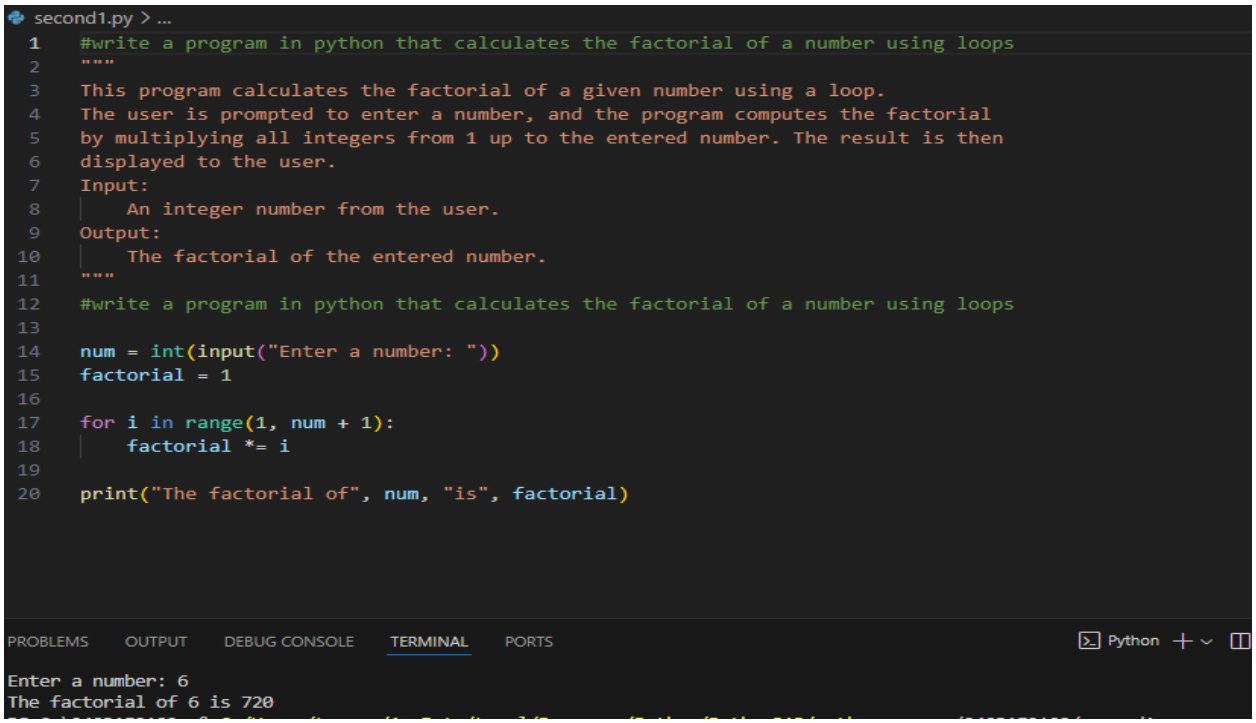
ASSIGNMENT-1

TASK-1:

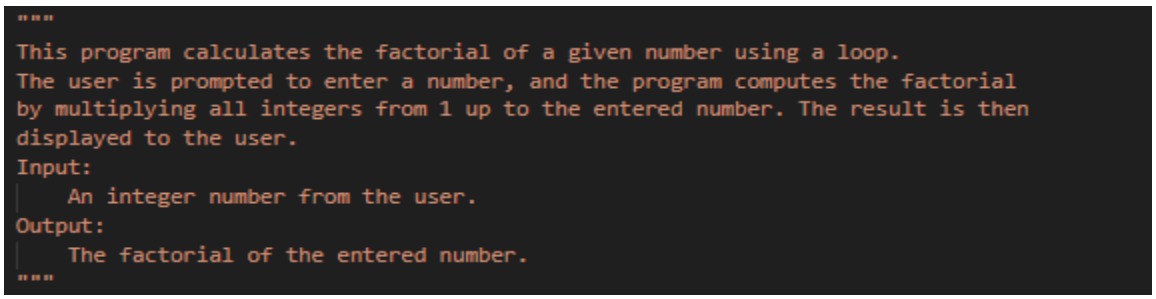
Prompt:

#write a python program that calculates the factorial of a number using loops.

Code and Output:



Explanation:

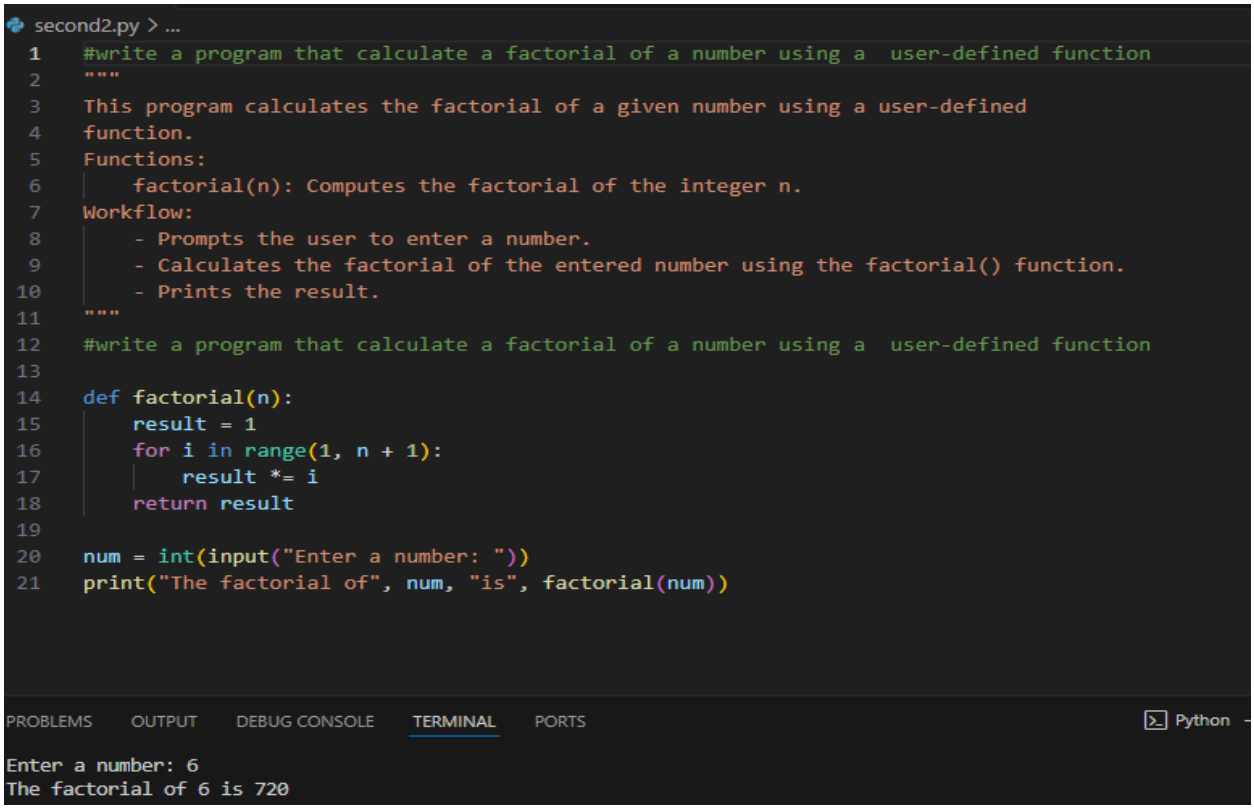


TASK-3 :

Prompt:

#write a python program that calculate a factorial of a number using a user-defined function.

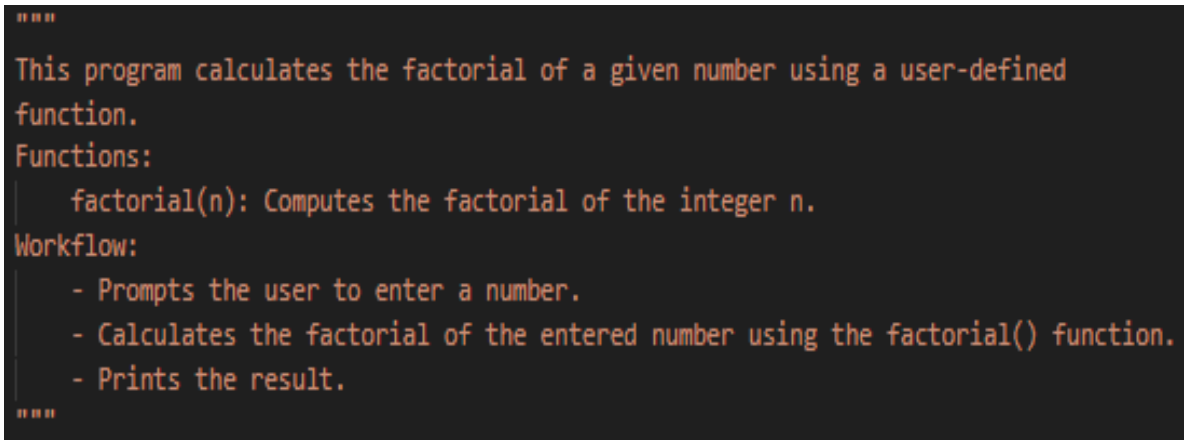
Code and Output:



```
second2.py > ...
#write a program that calculate a factorial of a number using a  user-defined function
"""
This program calculates the factorial of a given number using a user-defined
function.
Functions:
    factorial(n): Computes the factorial of the integer n.
Workflow:
    - Prompts the user to enter a number.
    - Calculates the factorial of the entered number using the factorial() function.
    - Prints the result.
"""
#write a program that calculate a factorial of a number using a  user-defined function

def factorial(n):
    result = 1
    for i in range(1, n + 1):
        result *= i
    return result

num = int(input("Enter a number: "))
print("The factorial of", num, "is", factorial(num))
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS                Python
Enter a number: 6
The factorial of 6 is 720
```

Explanation:



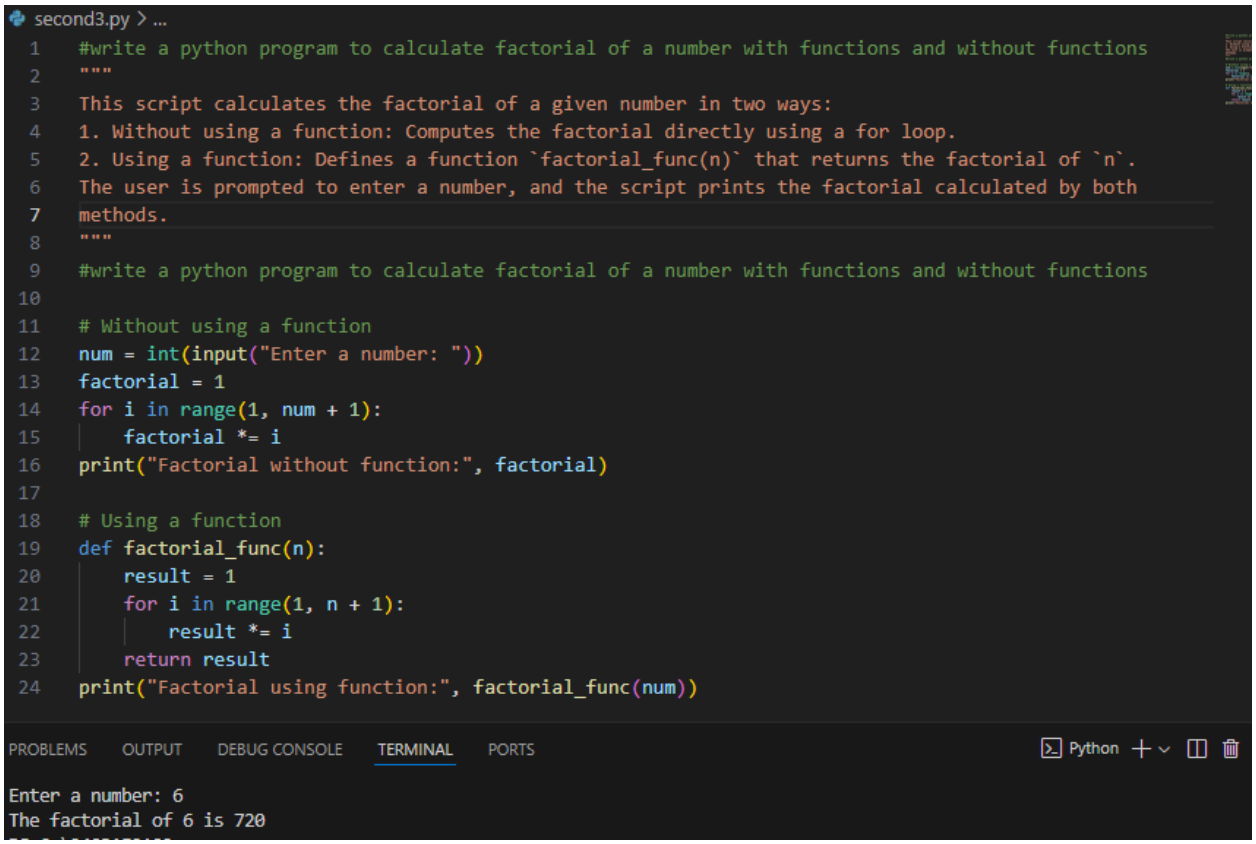
```
"""
This program calculates the factorial of a given number using a user-defined
function.
Functions:
    factorial(n): Computes the factorial of the integer n.
Workflow:
    - Prompts the user to enter a number.
    - Calculates the factorial of the entered number using the factorial() function.
    - Prints the result.
"""
```

TASK-4:

Prompt:

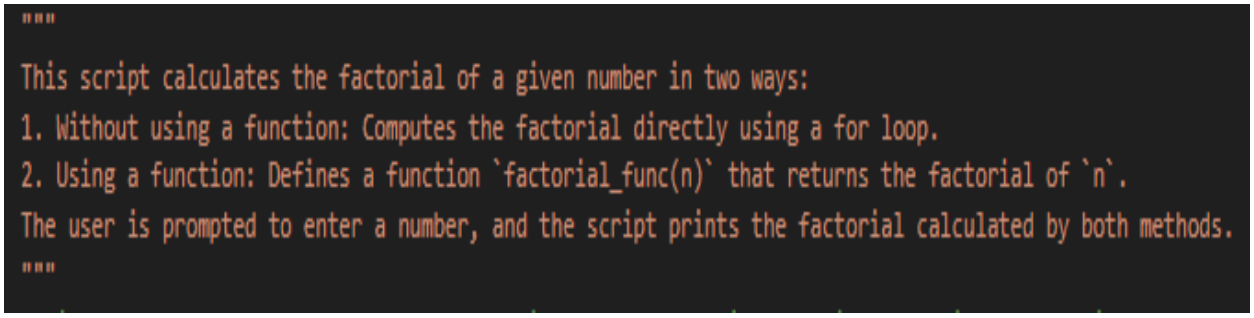
#write a python program calculate the factorial of a number with functions and without functions.

Code and Output:



```
second3.py > ...
1   #write a python program to calculate factorial of a number with functions and without functions
2   """
3   This script calculates the factorial of a given number in two ways:
4   1. Without using a function: Computes the factorial directly using a for loop.
5   2. Using a function: Defines a function `factorial_func(n)` that returns the factorial of `n`.
6   The user is prompted to enter a number, and the script prints the factorial calculated by both
7   methods.
8   """
9   #write a python program to calculate factorial of a number with functions and without functions
10
11  # Without using a function
12  num = int(input("Enter a number: "))
13  factorial = 1
14  for i in range(1, num + 1):
15      factorial *= i
16  print("Factorial without function:", factorial)
17
18  # Using a function
19  def factorial_func(n):
20      result = 1
21      for i in range(1, n + 1):
22          result *= i
23      return result
24  print("Factorial using function:", factorial_func(num))

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS        Python

Enter a number: 6
The factorial of 6 is 720
```

Explanation:



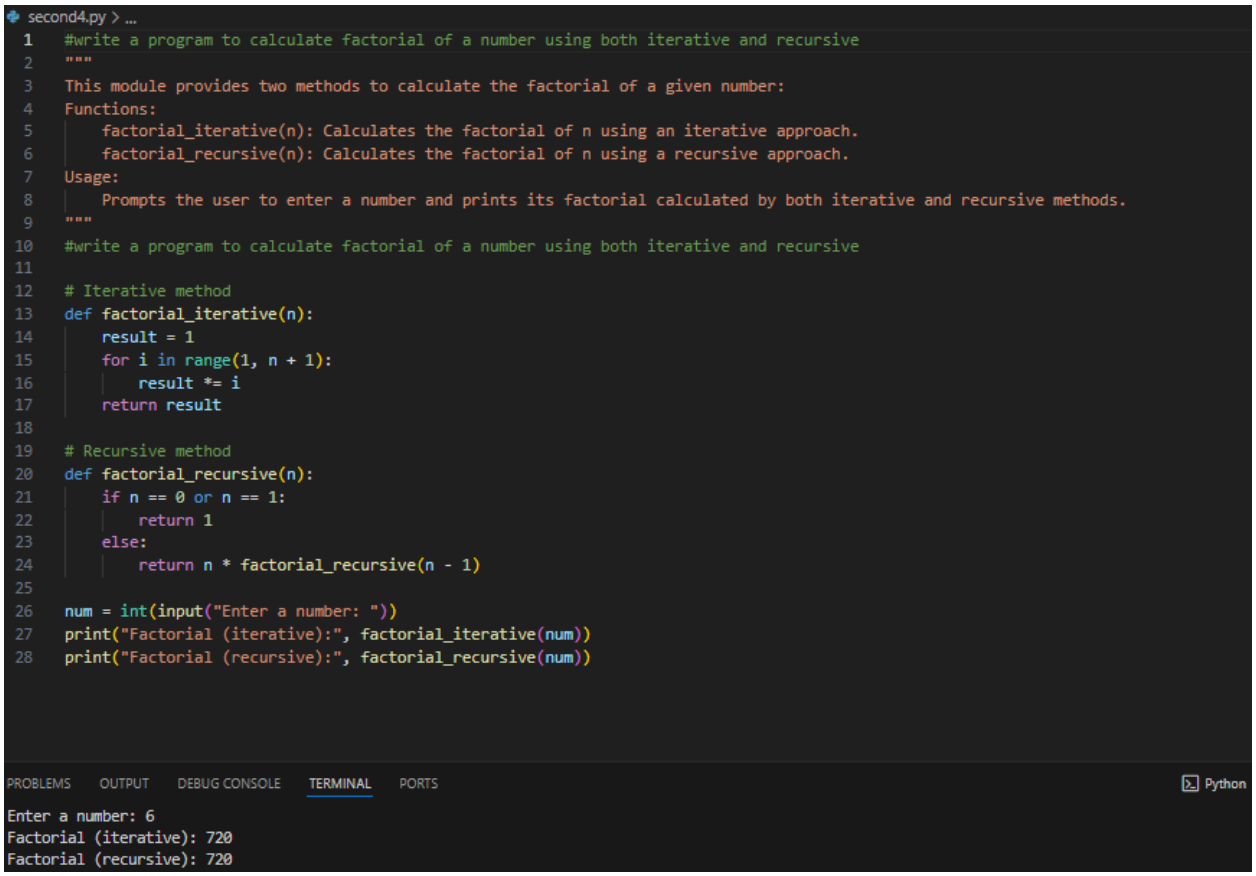
```
"""
This script calculates the factorial of a given number in two ways:
1. Without using a function: Computes the factorial directly using a for loop.
2. Using a function: Defines a function `factorial_func(n)` that returns the factorial of `n`.
The user is prompted to enter a number, and the script prints the factorial calculated by both methods.
"""
```

TASK-5:

Prompt:

#write a python program to calculate factorial of a number using both iterative and recursive.

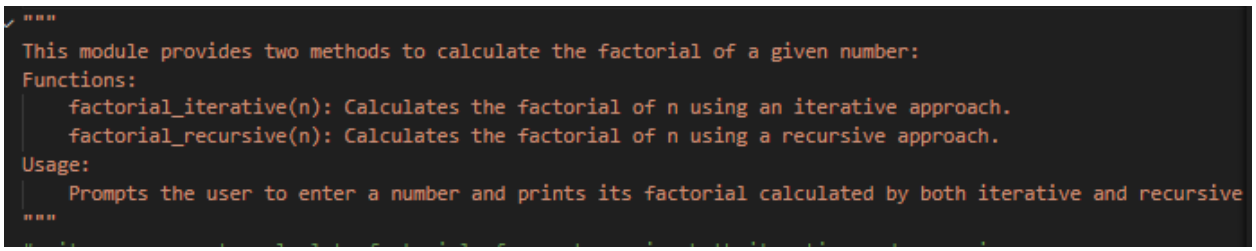
Code and Output:



```
second4.py > ...
#write a program to calculate factorial of a number using both iterative and recursive
"""
This module provides two methods to calculate the factorial of a given number:
Functions:
    factorial_iterative(n): Calculates the factorial of n using an iterative approach.
    factorial_recursive(n): Calculates the factorial of n using a recursive approach.
Usage:
    Prompts the user to enter a number and prints its factorial calculated by both iterative and recursive methods.
"""
#write a program to calculate factorial of a number using both iterative and recursive

# Iterative method
def factorial_iterative(n):
    result = 1
    for i in range(1, n + 1):
        result *= i
    return result

# Recursive method
def factorial_recursive(n):
    if n == 0 or n == 1:
        return 1
    else:
        return n * factorial_recursive(n - 1)

num = int(input("Enter a number: "))
print("Factorial (iterative):", factorial_iterative(num))
print("Factorial (recursive):", factorial_recursive(num))
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS                Python
Enter a number: 6
Factorial (iterative): 720
Factorial (recursive): 720
```

Explanation:



```
"""
This module provides two methods to calculate the factorial of a given number:
Functions:
    factorial_iterative(n): Calculates the factorial of n using an iterative approach.
    factorial_recursive(n): Calculates the factorial of n using a recursive approach.
Usage:
    Prompts the user to enter a number and prints its factorial calculated by both iterative and recursive
"""
```