

ASSIGNMENT -1

TASK-1:

Prompt:

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

Code and Output:

The image shows a Visual Studio Code editor window with a Python file named `second1.py`. The script calculates the factorial of a user-entered number using a loop. The code is as follows:

```
1  """#write a program in python that calculates the factorial of a number using loops
2  """
3  This program calculates the factorial of a given number using a loop.
4  The user is prompted to enter a number, and the program computes the factorial
5  by multiplying all integers from 1 up to the entered number. The result is then
6  displayed to the user.
7  Input:
8  |   An integer number from the user.
9  Output:
10 |   The factorial of the entered number.
11 """
12 #write a program in python that calculates the factorial of a number using loops
13
14 num = int(input("Enter a number: "))
15 factorial = 1
16
17 for i in range(1, num + 1):
18 |     factorial *= i
19
20 print("The factorial of", num, "is", factorial)
```

The bottom of the image shows the integrated terminal with the following output:

```
PS C:\2403A52102> & C:/Users/Lenovo/AppData/Local/Microsoft/WindowsApps/python3.13.exe c:/2403A52102/second1.py
Enter a number: 5
The factorial of 5 is 120
PS C:\2403A52102>
```

The terminal window title is `Python`, and the file explorer on the right shows the file `second1.py` in the directory `C:\2403A52102`.

Explanation:

```
"""
This program calculates the factorial of a given number using a loop.
The user is prompted to enter a number, and the program computes the factorial
by multiplying all integers from 1 up to the entered number. The result is then
displayed to the user.
Input:
    An integer number from the user.
Output:
    The factorial of the entered number.
"""
```

```
"""
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 methods.
7  """
8  #write a python program to calculate factorial of a number with functions and without functions
9
10 # Without using a function
11 num = int(input("Enter a number: "))
12 factorial = 1
13 for i in range(1, num + 1):
14     factorial *= i
15 print("Factorial without function:", factorial)
16
17 # Using a function
18 def factorial_func(n):
19     result = 1
20     for i in range(1, n + 1):
21         result *= i
22     return result
23 print("Factorial using function:", factorial_func(num))
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Python + ~ [Icons]

```
PS C:\2403A52102> & C:/Users/Lenovo/AppData/Local/Microsoft/WindowsApps/python3.13.exe c:/2403A52102/second3.py
Enter a number: 5
Factorial without function: 120
Factorial using function: 120
PS C:\2403A52102>
```

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.
"""
```

```
"""
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
"""
```