

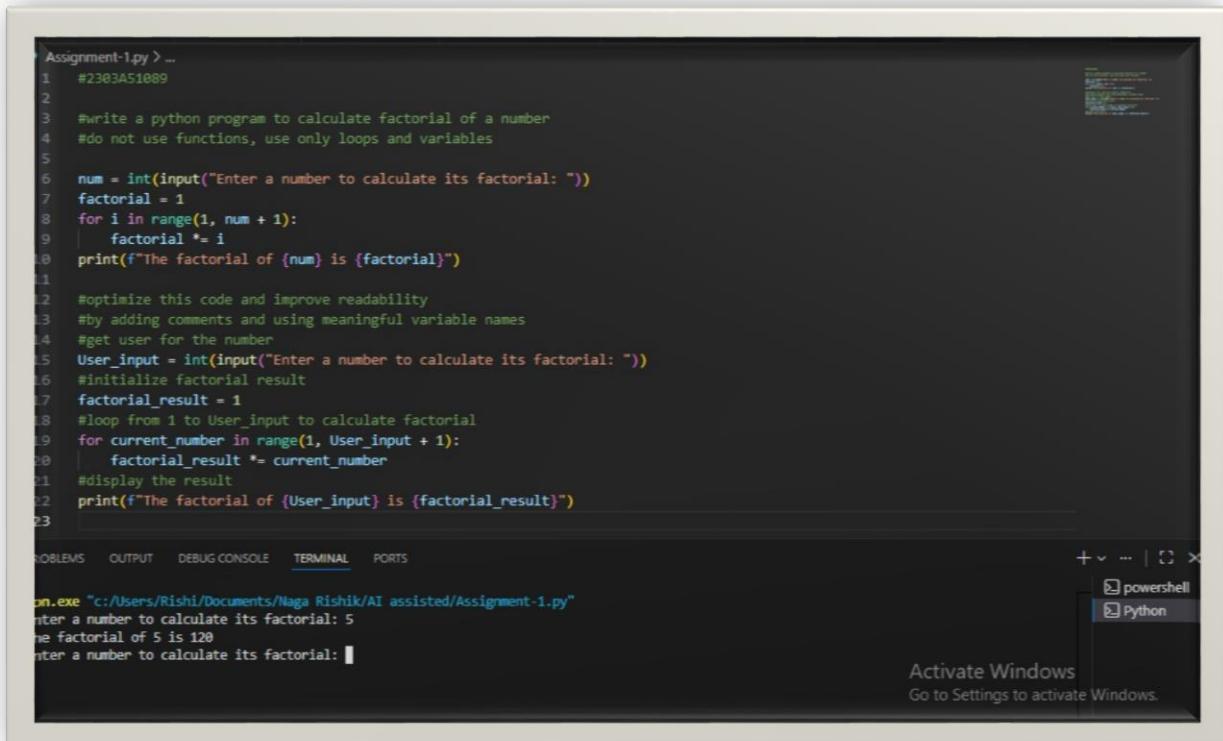
Assignment-1.1

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Task-1: AI-Generated logic without Modularization (Factorial without functions)



A screenshot of a code editor window titled 'Assignment-1.py > ...'. The code is as follows:

```
1 Assignment-1.py > ...
2 #2303A51089
3
4 #write a python program to calculate factorial of a number
5 #do not use functions, use only loops and variables
6
7 num = int(input("Enter a number to calculate its factorial: "))
8 factorial = 1
9 for i in range(1, num + 1):
10     factorial *= i
11 print(f"The factorial of {num} is {factorial}")
12
13 #optimize this code and improve readability
14 #by adding comments and using meaningful variable names
15 #get user for the number
16 User_input = int(input("Enter a number to calculate its factorial: "))
17 #initialize factorial result
18 factorial_result = 1
19 #loop from 1 to User_input to calculate factorial
20 for current_number in range(1, User_input + 1):
21     factorial_result *= current_number
22 #display the result
23 print(f"The factorial of {User_input} is {factorial_result}")
```

The terminal tab shows the output of the program:

```
python.exe "c:/Users/Rishi/Documents/Naga Rishik/AI assisted/Assignment-1.py"
Enter a number to calculate its factorial: 5
The factorial of 5 is 120
Enter a number to calculate its factorial: 
```

At the bottom right, there is a message: 'Activate Windows' and 'Go to Settings to activate Windows.'

Task-2: AI code Optimization and cleanup (Improving Efficiency)

The screenshot shows a code editor interface with a dark theme. At the top, there's a status bar with tabs for 'PROBLEMS', 'OUTPUT', 'DEBUG CONSOLE', 'TERMINAL' (which is selected), and 'PORTS'. Below the status bar is a code editor window containing the following Python script:

```
Assignment-1.py > ...
1  #2303A51089
2
3  #write a python to calculate factorial of a number, do not use functions ,use only loops and variables
4
5  num = int(input("Enter a number to calculate its factorial: "))
6  factorial = 1
7  for i in range(1, num + 1):
8      factorial *= i
9  print(f"The factorial of {num} is {factorial}")
10
```

Below the code editor is a terminal window showing the execution of the script. It starts with an error message:

```
ValueError: invalid literal for int() with base 10: '& C:/Users/Rishi/anaconda/python.exe "c:/Users/Rishi/Documents/Naga Rishik/AI assisted/Assignment-1.py"'
```

Then it shows the user input and the resulting output:

```
C:/Users/Rishi/Documents/Naga Rishik/AI assisted> & C:/Users/Rishi/anaconda/python.exe "c:/Users/Rishi/Documents/Naga Rishik/AI assisted/Assignment-1.py"
Enter a number to calculate its factorial: 5
The factorial of 5 is 120
C:/Users/Rishi/Documents/Naga Rishik/AI assisted>
```

On the right side of the terminal window, there are some UI elements: a 'power' icon, a 'Python' icon, and a message: 'Activate Windows' with a link 'Go to Settings to activate Windows.'

Task-3: Modular Design using AI assistance (Factorial with functions)

A screenshot of a Python code editor interface. The code in the editor is:

```
1 #write a python program to calculate factorial using a function , use meaningful variable names, add comments
2 def calculate_factorial(number):
3     """This function calculates the factorial of a given number."""
4     if number < 0:
5         return "Factorial is not defined for negative numbers."
6     elif number == 0 or number == 1:
7         return 1
8     else:
9         factorial = 1
10        for i in range(2, number + 1):
11            factorial *= i
12        return factorial
13 num = int(input("Enter a number to calculate its factorial: "))
14 result = calculate_factorial(num)
15 print(f"The factorial of {num} is {result}.")
```

The terminal below shows the output of running the script:

```
iK/AI assisted/Assignment-1.py"
C:\Users\Rishi\Documents\Waga Rishik\AI assisted> & C:/Users/Rishi/anaconda/python.exe "c:/Users/Rishi/Documents/Waga Rishik/AI assisted/Assignment-1.py"
Enter a number to calculate its factorial: 6
The factorial of 6 is 720.
```

Task-4: Comparative Analysis-Procedural vs Modular AI Code(with vs without functions)

A screenshot of a Python code editor interface. The code in the editor is:

```
3 #comparative analysis of a factorial calculation method - procedural vs Modular AI code (with vs without functions)
4 # Procedural approach (without functions)
5 n = int(input("Enter a number to calculate its factorial (procedural): "))
6 factorial = 1
7 for i in range(1, n + 1):
8     factorial *= i
9 print(f"Factorial of {n} (procedural) is: {factorial}")
10 # Modular approach (with functions)
11 def factorial_modular(num):
12     if num == 0 or num == 1:
13         return 1
14     else:
15         return num * factorial_modular(num - 1)
16 n_mod = int(input("Enter a number to calculate its factorial (modular): "))
17 result = factorial_modular(n_mod)
18 print(f"Factorial of {n_mod} (modular) is: {result}")
19
```

The terminal below shows the output of running the script:

```
(procedural): 5
Factorial of 5 (procedural) is: 120
Enter a number to calculate its factorial (modular): 6
Factorial of 6 (modular) is: 720
PS C:\Users\Rishi\Documents\Waga Rishik\AI assisted>
```

Task-5:AI-Generated iterative vs Recursive thinking

```
2
3 #generate iterative program in python
4 def iterative_factorial(n):
5     result = 1
6     for i in range(2, n + 1):
7         result *= i
8     return result
9 print("Iterative Factorial of 5:", iterative_factorial(5))
10
11 #generate recursive program in python
12 def recursive_factorial(n):
13     if n == 0 or n == 1:
14         return 1
15     else:
16         return n * recursive_factorial(n - 1)
17 print("Recursive Factorial of 5:", recursive_factorial(5))
18 #generate recursive factorial program in python
19 def recursive_factorial(n):
20     if n == 0 or n == 1:
21         return 1
22     else:
23         return n * recursive_factorial(n - 1)
24 print("Recursive Factorial of 5:", recursive_factorial(5))
25
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS + v ... | ☰ ×

signment-1.py

Iterative Factorial of 5: 120
Recursive Factorial of 5: 120
Recursive Factorial of 5: 120
PS C:\Users\Rishi\Documents\Naga Rishik\AI assisted\As

Activate Windows
Go to Settings to activate Windows.

powershell Python