

## ASSIGNMENT-1

NAME:G.VARSHITHA

BATCH-16

HTNO:-2303A51053

### Task1:AI-GeneratedLogicWithoutModularisation(*Factorial without Functions*)

The screenshot shows the Thonny IDE interface. The top menu bar includes File, Edit, View, Run, Tools, and Help. The main window has a toolbar with icons for file operations like Open, Save, and Run. A code editor window titled '<untitled>' contains the following Python code:

```
1 num = int(input("Enter a number to calculate its factorial: "))
2 if num < 0:
3     print("Factorial is not defined for negative numbers")
4 else:
5     factorial = 1
6     for i in range(1, num + 1):
7         factorial *= i
8     print(f"The factorial of {num} is {factorial}")
9
```

Below the code editor is a shell window titled 'Shell' with the following content:

```
>>> %Run -c $EDITOR_CONTENT
Enter a number to calculate its factorial: 5
The factorial of 5 is 120
>>> |
```

### Task2:AI Code Optimization & Cleanup (*Improving Efficiency and Readability*)

The screenshot shows the Thonny Python IDE interface. The top window is titled "Thonny - <untitled> @ 7:24" and contains a code editor with the following Python script:

```
1 num = int(input("Enter a number to calculate its factorial: "))
2 if num < 0:
3     print("Factorial is not defined for negative numbers")
4 else:
5     result = 1
6     for value in range(1, num + 1):
7         result *= value
8     print(f"The factorial of {num} is {result}")
9
```

The bottom window is titled "Shell" and shows the output of running the script:

```
>>> %Run -c $EDITOR_CONTENT
Enter a number to calculate its factorial: 6
The factorial of 6 is 720
>>> |
```

***Task3:ModularDesignUsingAIAssistance(FactorialwithFunctions)***

The screenshot shows the Thonny Python IDE interface. The top window is titled "Thonny - <untitled> @ 9:34" and contains a code editor with the following Python script:

```
1 def calculate_factorial(n):
2     if n < 0:
3         return "Factorial is not defined for negative numbers"
4     result = 1
5     for i in range(1, n + 1):
6         result *= i
7     return result
8 num = int(input("Enter a number to calculate its factorial: "))
9 output = calculate_factorial(num)
10 if isinstance(output, str):
11     print(output)
12 else:
13     print(f"The factorial of {num} is {output}")
14
```

The bottom window is titled "Shell" and shows the execution of the code:

```
>>> %Run -c $EDITOR_CONTENT
Enter a number to calculate its factorial: 5
The factorial of 5 is 120
>>>
```

**Task4:ComparativeAnalysis–ProceduralvsModularAI** *Code Procedural*

**(Without Function):-**

The screenshot shows the Thonny Python IDE interface. The top window is the code editor with the title "Thonny - <untitled> @ 11:1". It contains the following Python code:

```
1 num = int(input("Enter a number to calculate its factorial: "))
2
3 if num < 0:
4     print("Factorial is not defined for negative numbers")
5 else:
6     result = 1
7     for i in range(1, num + 1):
8         result *= i
9
10    print(f"The factorial of {num} is {result}")
11
```

The bottom window is the "Shell" tab, which displays the output of running the script. The command `>>> %Run -c \$EDITOR\_CONTENT` is run, followed by the user input "Enter a number to calculate its factorial: 4", the program's response "The factorial of 4 is 24", and an empty line for further input.

### ***Modular(WithFunction)***

The screenshot shows the Thonny Python IDE interface. The top window is the script editor titled 'Thonny - <untitled> @ 9:21'. It contains the following Python code:

```
1 def factorial(n):
2     if n < 0:
3         return "Factorial is not defined for negative numbers"
4     result = 1
5     for i in range(1, n + 1):
6         result *= i
7     return result
8 num = int(input("Enter a number to calculate its factorial: "))
9 res = factorial(num)
10 if isinstance(res, str):
11     print(res)
12 else:
13     print(f"The factorial of {num} is {res}")
14
```

The bottom window is the shell terminal titled 'Shell'. It shows the command '%Run -c \$EDITOR\_CONTENT' being run, followed by the user's input '5' and the program's output 'The factorial of 5 is 120'.

### **Task5:AI-GeneratedIterativevsRecursiveThinking Iterative**

#### **Approach**

The screenshot shows the Thonny Python IDE interface. The top window is the code editor with the title "Thonny - <untitled> @ 8:23". It contains the following Python code:

```
1 # Iterative factorial program
2 num = int(input("Enter a number to calculate its factorial: "))
3 if num < 0:
4     print("Factorial is not defined for negative numbers")
5 else:
6     factorial = 1
7     for i in range(1, num + 1):
8         factorial *= i
9     print(f"The factorial of {num} is {factorial}")
10
```

The bottom window is the shell, titled "Shell". It shows the command "%Run -c \$EDITOR\_CONTENT" followed by the program's output:

```
>>> %Run -c $EDITOR_CONTENT
Enter a number to calculate its factorial: 5
The factorial of 5 is 120
>>> |
```

*RecursiveApproach*

The screenshot shows the Thonny Python IDE interface. The top menu bar includes File, Edit, View, Run, Tools, and Help. Below the menu is a toolbar with icons for file operations like Open, Save, and Run. The main window has two tabs: <untitled> and Shell.

The code editor tab (<untitled>) contains the following Python script:

```
1 # Recursive factorial program
2 def factorial(n):
3     if n <= 1:
4         return 1
5     return n * factorial(n - 1)
6 num = int(input("Enter a number to calculate its factorial: "))
7 if num < 0:
8     print("Factorial is not defined for negative numbers")
9 else:
10    result = factorial(num)
11    print(f"The factorial of {num} is {result}")
12
```

The Shell tab shows the output of running the script:

```
>>> %Run -c $EDITOR_CONTENT
Enter a number to calculate its factorial: 5
The factorial of 5 is 120
>>> |
```