

AI Assisted Problem Solving Using Python

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Program Name: M.Tech (CSE)

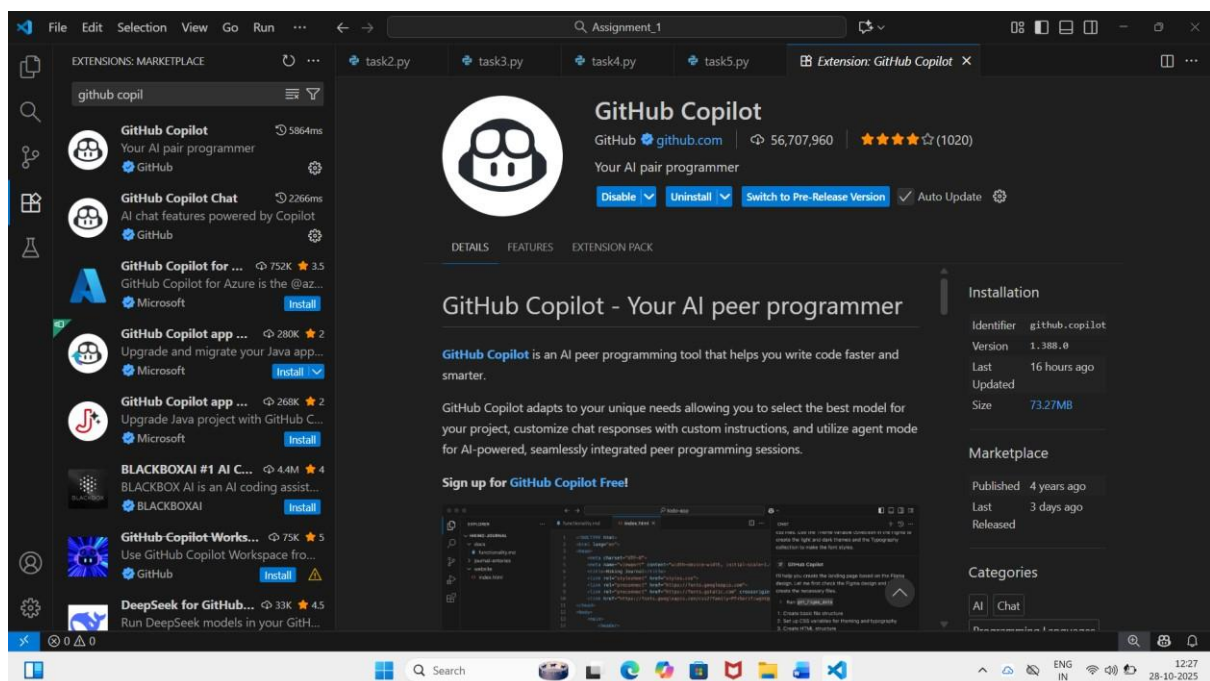
Lab 1: Environment Setup – GitHub Copilot and VS Code Integration

Task Description#1

- Install and configure GitHub Copilot in VS Code.

Expected Output#1

- Install and configure GitHub Copilot in VS Code.



Task Description#2

- Use Copilot to generate a `is_prime()` Python function.

Expected Output#2

- Function to check primality with correct logic.

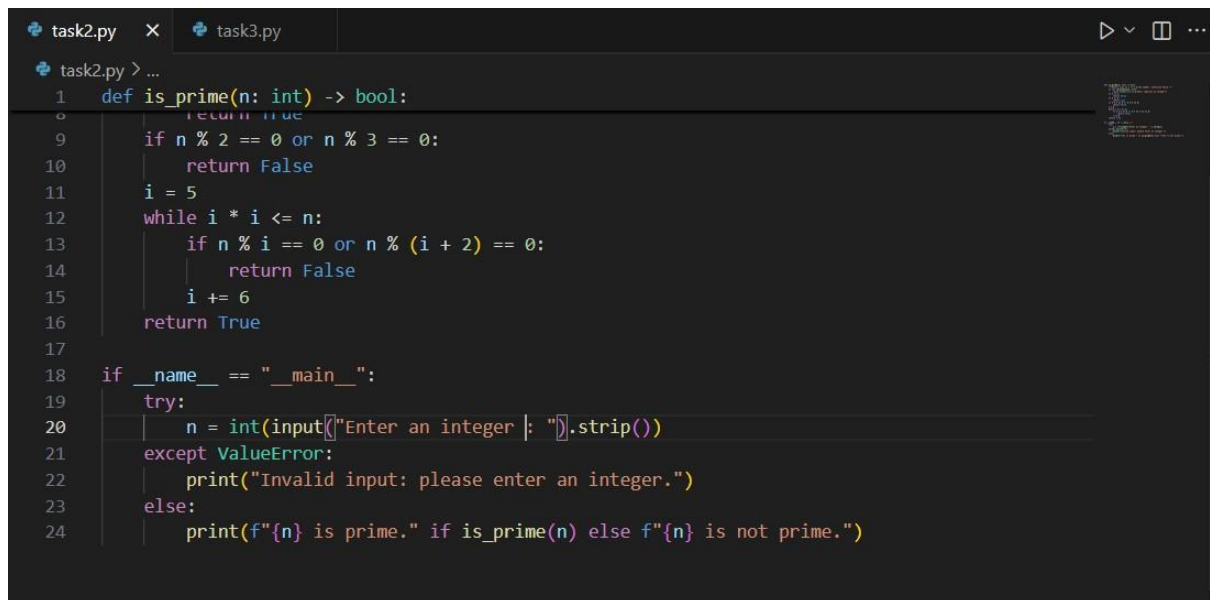
Prompt_1:

Create a function named `is_prime()` to check primality.

Prompt_2:

Now, update this code where the user can take the input from keyboard.

CODE:



```
task2.py x task3.py
task2.py > ...
1 def is_prime(n: int) -> bool:
2     return True
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9     if n % 2 == 0 or n % 3 == 0:
10         return False
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12     i = 5
13     while i * i <= n:
14         if n % i == 0 or n % (i + 2) == 0:
15             return False
16         i += 6
17     return True
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```

task4.py > ...
1  # Recursive factorial
2  def factorial_recursive(n: int) -> int:
3      """Return n! using recursion."""
4      if not isinstance(n, int):
5          raise TypeError("factorial_recursive() requires an integer")
6      if n < 0:
7          raise ValueError("factorial_recursive() requires a non-negative integer")
8      if n == 0 or n == 1:
9          return 1
10     return n * factorial_recursive(n - 1)
11
12 # Iterative factorial
13 def factorial_iterative(n: int) -> int:
14     """Return n! using an iterative approach."""
15     if not isinstance(n, int):
16         raise TypeError("factorial_iterative() requires an integer")
17     if n < 0:
18         raise ValueError("factorial_iterative() requires a non-negative integer")
19     result = 1
20     for i in range(2, n + 1):
21         result *= i
22     return result
23
24 def factorial_io() -> None:
25     """Read an integer from input, print factorials computed iteratively and recursively."""
26     try:
27         n = int(input("Enter a non-negative integer: ").strip())
28         if n < 0:
29             print("Invalid input: please enter a non-negative integer.")
30             return
31     except ValueError:
32         print("Invalid input: please enter an integer.")
33     return
34
35     print(f"Iterative: {n}! = {factorial_iterative(n)}")
36     print(f"Recursive: {n}! = {factorial_recursive(n)}")

```

OUTPUT:

```

Enter a non-negative integer: & C:/Users/DELL/AppData/Local/Programs/Python/Python313/python.exe
c:/AIPP1/task4.py
Invalid input: please enter an integer.
PS C:\AIPP1> & C:/Users/DELL/AppData/Local/Programs/Python/Python313/python.exe c:/AIPP1/task4.py
Enter a non-negative integer: 6
Iterative: 6! = 720
Recursive: 6! = 720

```

Task Description#5

- Use Copilot to find the largest number in a list. Assess code quality and efficiency.

Expected Output#5

- A valid function with your review

Prompt_1:

Create a function to find the largest number in a list where the list need to be taken from keyboard.

CODE:

```
task5.py > ...
1 def find_max(numbers: list[float]) -> float:
2     """Return the largest number in a non-empty list of numbers."""
3     if not isinstance(numbers, list):
4         raise TypeError("find_max() requires a list")
5     if not numbers:
6         raise ValueError("find_max() requires a non-empty list")
7     max_val = numbers[0]
8     for x in numbers[1:]:
9         if x > max_val:
10             max_val = x
11     return max_val
12
13 def find_max_io() -> None:
14     """Read a list of numbers from keyboard, print the largest, and return nothing."""
15     s = input("Enter numbers separated by spaces or commas: ").strip()
16     if not s:
17         print("No input provided.")
18         return
19     import re
20     parts = [p for p in re.split(r"[\s,]+", s) if p != ""]
21     try:
22         nums = [float(p) for p in parts]
23     except ValueError:
24         print("Invalid input: please enter only numbers separated by spaces or commas.")
25         return
26     try:
27         largest = find_max(nums)
28     except ValueError as e:
29         print(e)
30         return
31     # Print as int when the number is an integer value
32     if largest.is_integer():
33         print(f"Largest number: {int(largest)}")
34     else:
35         print(f"Largest number: {largest}")
36
37 if __name__ == "__main__":
38     find_max_io()
```

OUTPUT:

```
11
● PS C:\AIPP1> & C:/Users/DELL/AppData/Local/Programs/Python/Python313/python.exe c:/AIPP1/task5.py

Enter numbers separated by spaces or commas: 12,19,42,43,11
Largest number: 43
○ PS C:\AIPP1> 
```