AI Assisted Problem Solving Using Python

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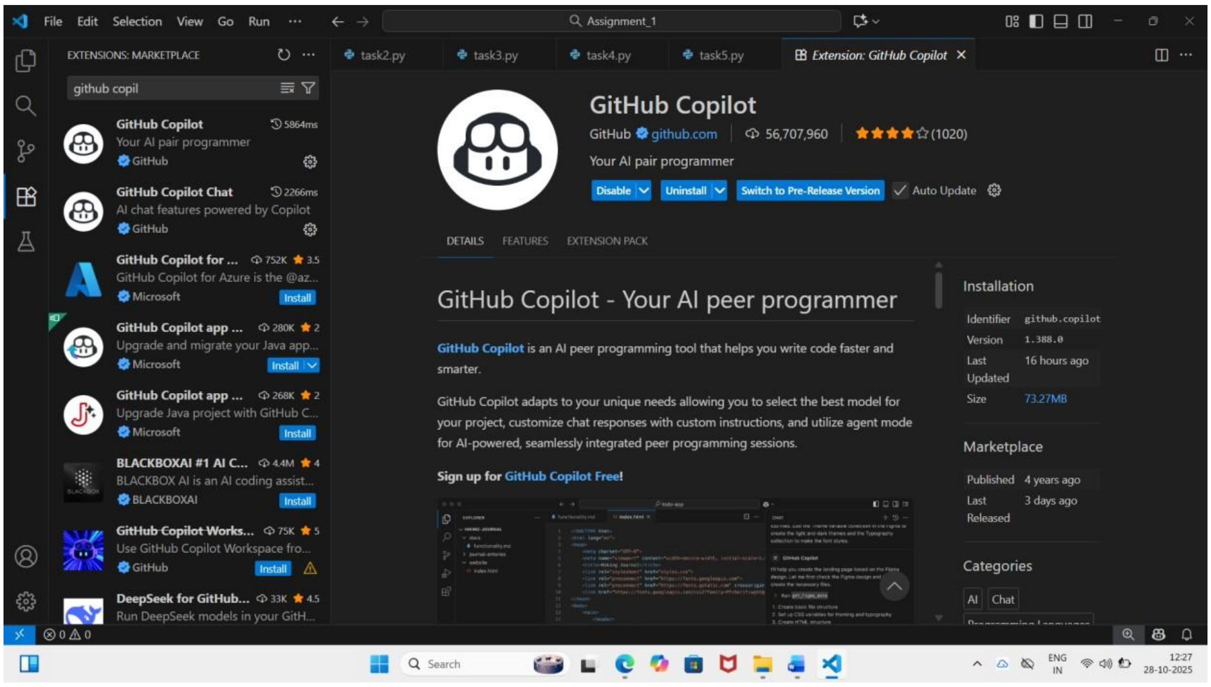
Program Name: M.Tech (CSE)

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.



GitHub Copilot — Your AI pair programmer — GitHub — 5864ms
GitHub Copilot Chat — AI chat features powered by Copilot — GitHub — 2266ms
GitHub Copilot for ... — 752K ★ 3.5 — GitHub Copilot for Azure is the @az... — Microsoft
GitHub Copilot app ... — 280K ★ 2 — Upgrade and migrate your Java app... — Microsoft
GitHub Copilot app ... — 268K ★ 2 — Upgrade Java project with GitHub C... — Microsoft
BLACKBOXAI #1 AI C... — 4.4M ★ 4 — BLACKBOX AI is an AI coding assist... — BLACKBOXAI
GitHub Copilot Works... — 75K ★ 5 — Use GitHub Copilot Workspace fro... — GitHub
DeepSeek for GitHub... — 33K ★ 4.5 — Run DeepSeek models in your GitH...

GitHub Copilot
GitHub github.com | 56,707,960 | ★★★★☆ (1020)
Your AI pair programmer

GitHub Copilot - Your AI peer programmer

GitHub Copilot is an AI peer programming tool that helps you write code faster and smarter.

GitHub Copilot adapts to your unique needs allowing you to select the best model for your project, customize chat responses with custom instructions, and utilize agent mode for AI-powered, seamlessly integrated peer programming sessions.

Sign up for GitHub Copilot Free!

Installation
Identifier github.copilot
Version 1.388.0
Last Updated 16 hours ago
Size 73.27MB

Marketplace
Published 4 years ago
Last Released 3 days ago

12:27
28-10-2025

Task Description#2

● Use Copilot to generate a is_prime() Python function.

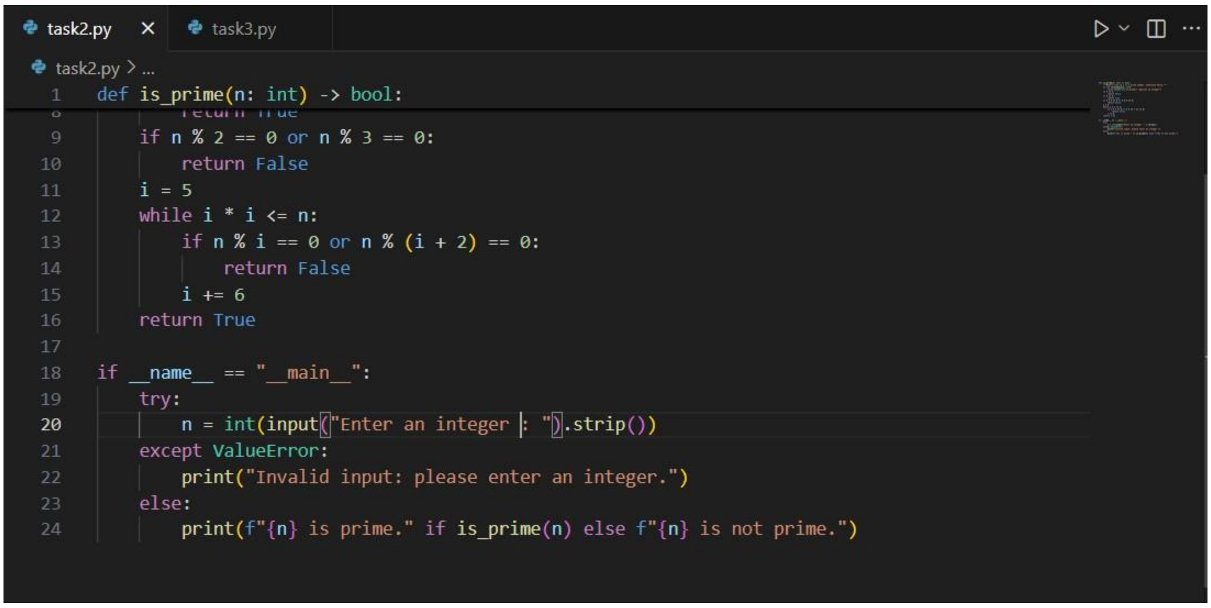
Expected Output#2
● Function to check primality with correct logic.

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.

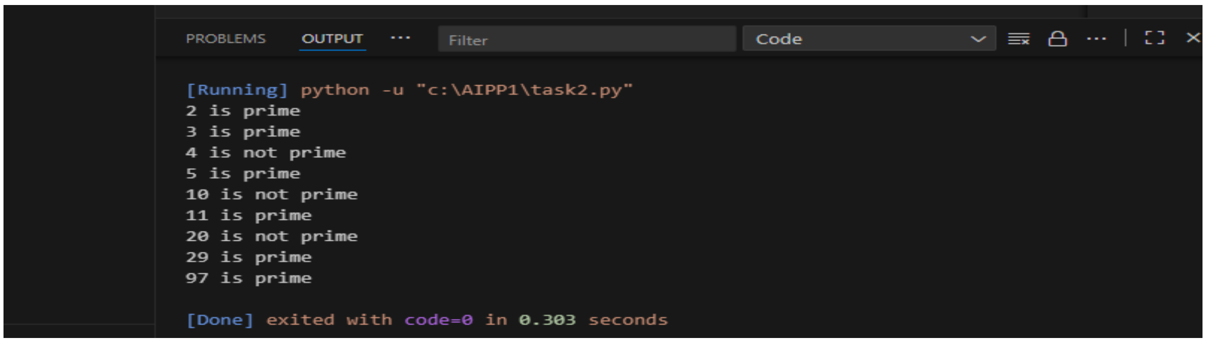
CODE:



```
task2.py    task3.py
task2.py > ...
def is_prime(n: int) -> bool:
        return True
    if n % 2 == 0 or n % 3 == 0:
        return False
    i = 5
    while i * i <= n:
        if n % i == 0 or n % (i + 2) == 0:
            return False
        i += 6
    return True

if __name__ == "__main__":
    try:
        n = int(input("Enter an integer : ").strip())
    except ValueError:
        print("Invalid input: please enter an integer.")
    else:
        print(f"{n} is prime." if is_prime(n) else f"{n} is not prime.")
```

OUTPUT:



```
[Running] python -u "c:\AIPP1\task2.py"
2 is prime
3 is prime
4 is not prime
5 is prime
10 is not prime
11 is prime
20 is not prime
29 is prime
97 is prime

[Done] exited with code=0 in 0.303 seconds
```

Task Description#3

- Write a comment like # Function to reverse a string and use Copilot to generate the function.

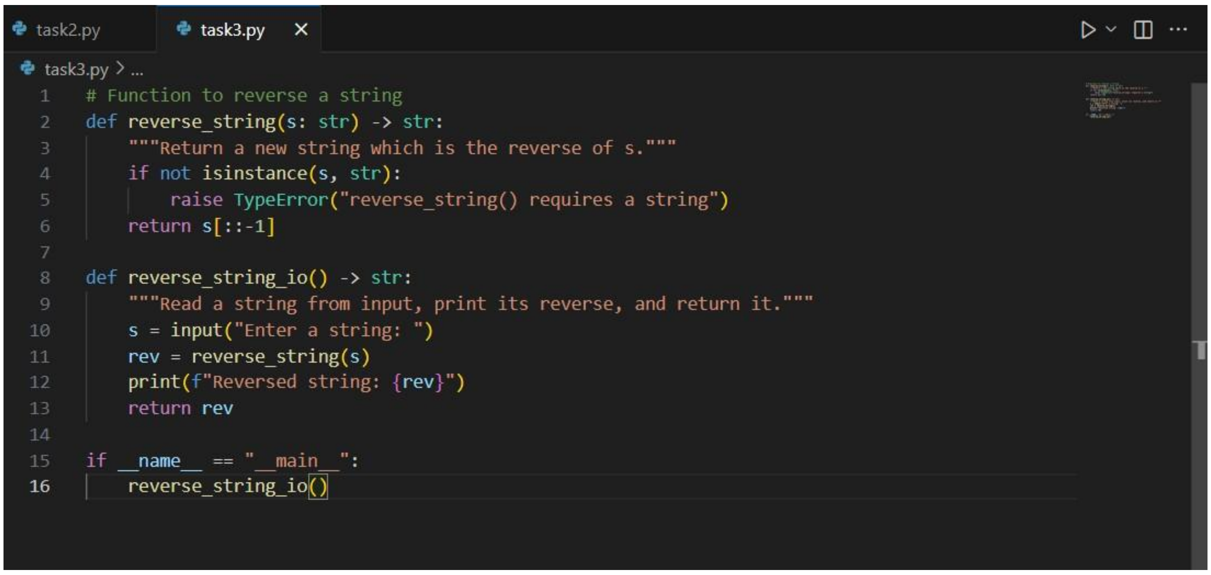
Expected Output#3

- Auto-completed reverse function

Prompt_1:

Create a function to reverse a string and provide the auto completed reverse function output.

CODE:

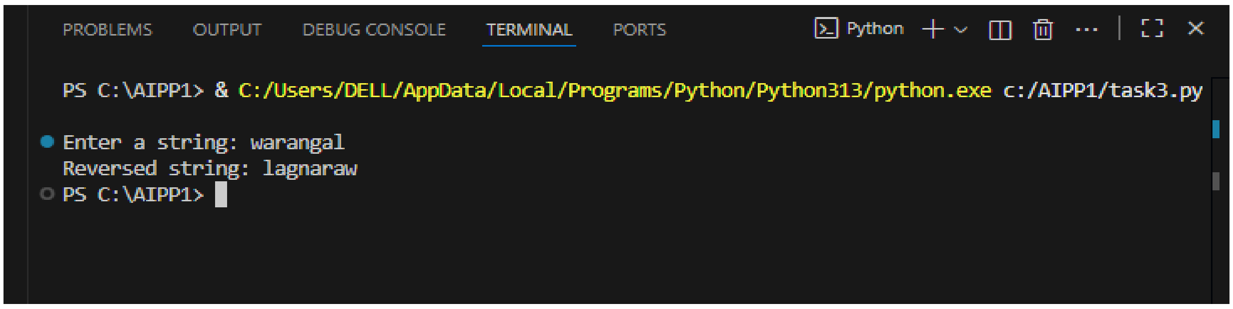


```python
# Function to reverse a string
def reverse_string(s: str) -> str:
    """Return a new string which is the reverse of s."""
    if not isinstance(s, str):
        raise TypeError("reverse_string() requires a string")
    return s[::-1]

def reverse_string_io() -> str:
    """Read a string from input, print its reverse, and return it."""
    s = input("Enter a string: ")
    rev = reverse_string(s)
    print(f"Reversed string: {rev}")
    return rev

if __name__ == "__main__":
    reverse_string_io()
```

OUTPUT:



```
PS C:\AIPP1> & C:/Users/DELL/AppData/Local/Programs/Python/Python313/python.exe c:/AIPP1/task3.py

Enter a string: warangal
Reversed string: lagnaraw
PS C:\AIPP1> 
```

Task Description#4

● Generate both recursive and iterative versions of a factorial function using comments..

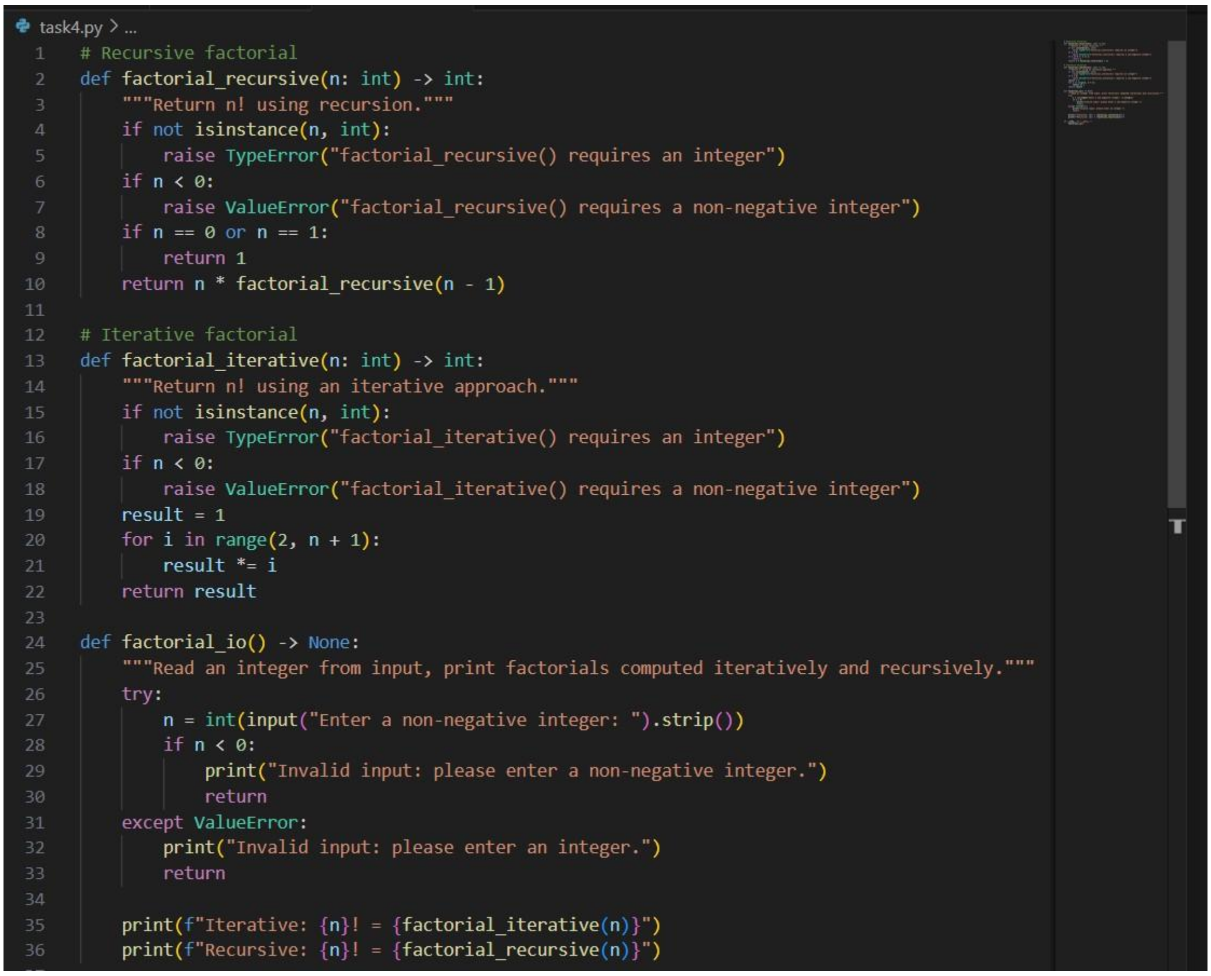
Expected Output#4

● Two working factorial implementations

Prompt_1:

Generate both recursive and iterative versions of a factorial function where the output needs to return two working factorial implementations.

CODE:



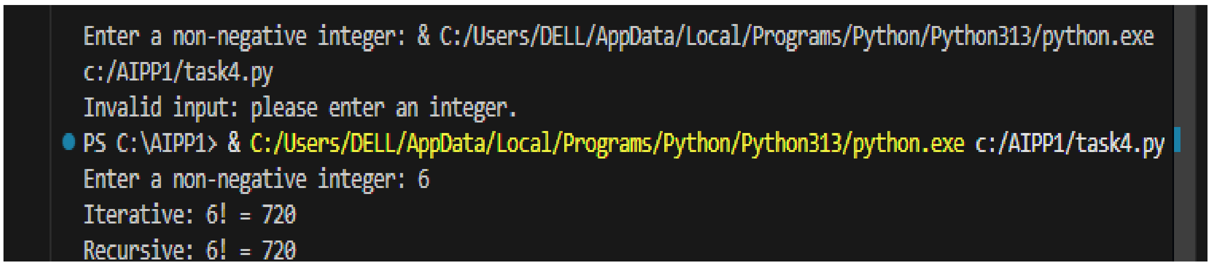
```python
# Recursive factorial
def factorial_recursive(n: int) -> int:
    """Return n! using recursion."""
    if not isinstance(n, int):
        raise TypeError("factorial_recursive() requires an integer")
    if n < 0:
        raise ValueError("factorial_recursive() requires a non-negative integer")
    if n == 0 or n == 1:
        return 1
    return n * factorial_recursive(n - 1)

# Iterative factorial
def factorial_iterative(n: int) -> int:
    """Return n! using an iterative approach."""
    if not isinstance(n, int):
        raise TypeError("factorial_iterative() requires an integer")
    if n < 0:
        raise ValueError("factorial_iterative() requires a non-negative integer")
    result = 1
    for i in range(2, n + 1):
        result *= i
    return result

def factorial_io() -> None:
    """Read an integer from input, print factorials computed iteratively and recursively."""
    try:
        n = int(input("Enter a non-negative integer: ").strip())
        if n < 0:
            print("Invalid input: please enter a non-negative integer.")
            return
    except ValueError:
        print("Invalid input: please enter an integer.")
        return

    print(f"Iterative: {n}! = {factorial_iterative(n)}")
    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.

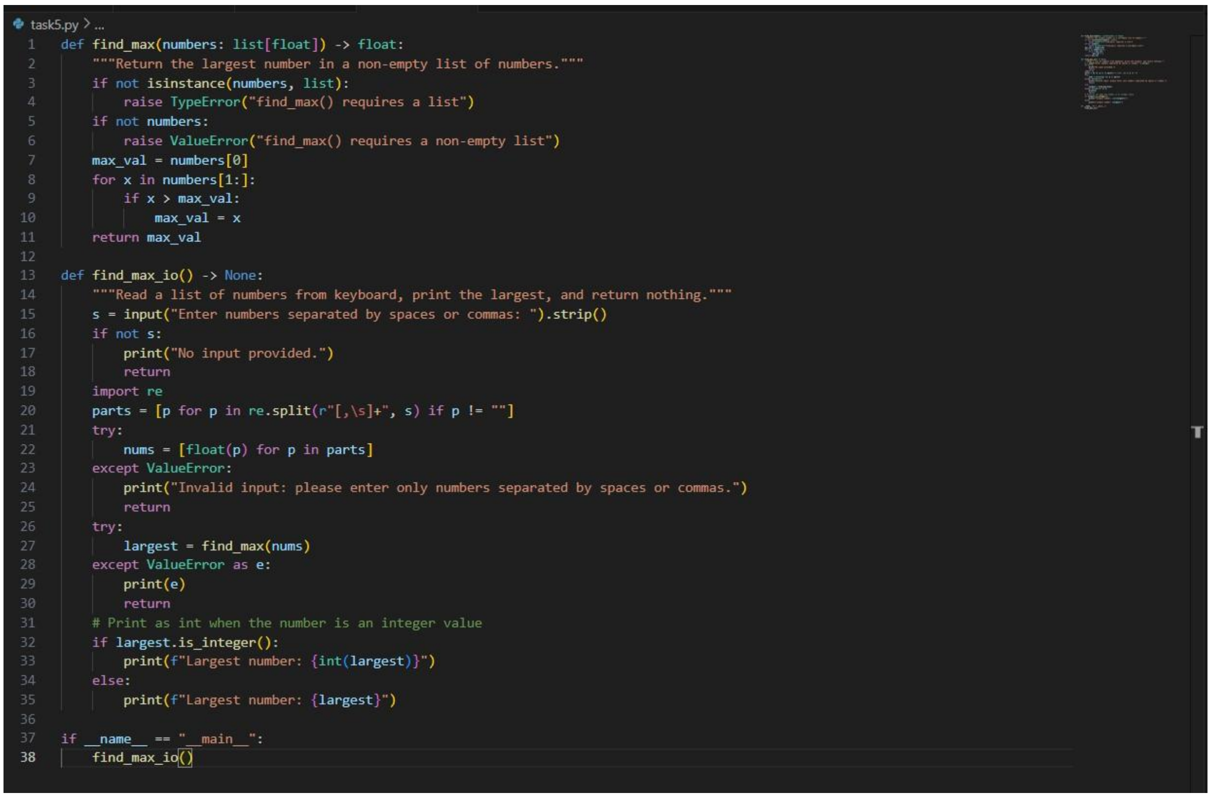
Expected Output#5

● 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:



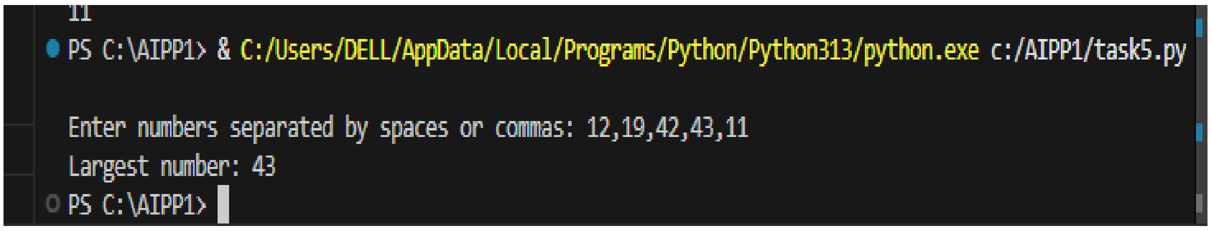
task5.py > ...

```python
def find_max(numbers: list[float]) -> float:
    """Return the largest number in a non-empty list of numbers."""
    if not isinstance(numbers, list):
        raise TypeError("find_max() requires a list")
    if not numbers:
        raise ValueError("find_max() requires a non-empty list")
    max_val = numbers[0]
    for x in numbers[1:]:
        if x > max_val:
            max_val = x
    return max_val

def find_max_io() -> None:
    """Read a list of numbers from keyboard, print the largest, and return nothing."""
    s = input("Enter numbers separated by spaces or commas: ").strip()
    if not s:
        print("No input provided.")
        return
    import re
    parts = [p for p in re.split(r"[,\s]+", s) if p != ""]
    try:
        nums = [float(p) for p in parts]
    except ValueError:
        print("Invalid input: please enter only numbers separated by spaces or commas.")
        return
    try:
        largest = find_max(nums)
    except ValueError as e:
        print(e)
        return
    # Print as int when the number is an integer value
    if largest.is_integer():
        print(f"Largest number: {int(largest)}")
    else:
        print(f"Largest number: {largest}")

if __name__ == "__main__":
    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>
```