

# AI ASSISTED CODING

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Batch:13

Assignment - 3.4 Task-1. Zero-shot

Prompt – Fibonacci Series Generator

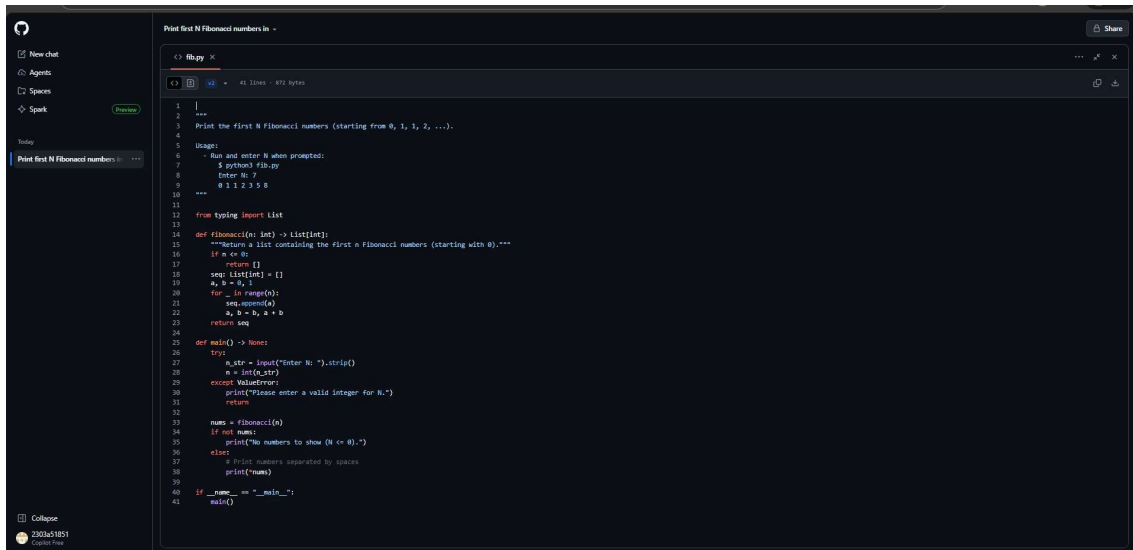
Task Description :

Without giving an example, write a single comment prompt asking GitHub Copilot to generate a Python function to print the first N Fibonacci numbers.

Prompt :

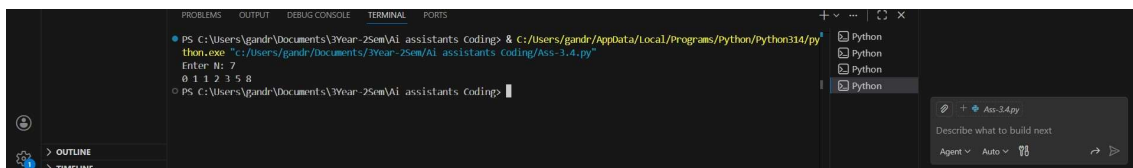
```
# Write a Python code that prints the first N  
Fibonacci numbers
```

Code



```
1 |
2 """
3 Print the first N Fibonacci numbers (starting from 0, 1, 1, 2, ...).
4
5 Usage:
6 Run and enter N when prompted:
7 $ python fib.py
8 Enter N: 7
9 0 1 1 2 3 5 8
10 """
11
12 from typing import List
13
14 def fibonacci(n: int) -> List[int]:
15     """Return a list containing the first n Fibonacci numbers (starting with 0)."""
16     if n <= 0:
17         return []
18     seq: List[int] = []
19     a, b = 0, 1
20     for _ in range(n):
21         seq.append(a)
22         a, b = b, a + b
23     return seq
24
25 def main() -> None:
26     try:
27         n_str = input("Enter N: ").strip()
28         n = int(n_str)
29     except ValueError:
30         print("Please enter a valid integer for N.")
31         return
32
33     nums = fibonacci(n)
34     if not nums:
35         print("No numbers to show (N <= 0).")
36     else:
37         # Print numbers separated by spaces
38         print(" ".join(str(num) for num in nums))
39
40 if __name__ == "__main__":
41     main()
```

Out Put:



```
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding> C:\Users\gandr\AppData\Local\Programs\Python\python314\python.exe "C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding\Ass-3.4.py"
Enter N: 7
0 1 1 2 3 5 8
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding>
```

## Justification:

In this task, Copilot was given only a single comment without any example. Despite the lack of context, it successfully generated a correct Fibonacci function, showing that zero-shot prompting works well for common and well-known problems. However, the logic was basic and depended entirely on Copilot's prior training. This demonstrates that zero-shot prompts are effective for simple, standard tasks but may lack customization or optimization.

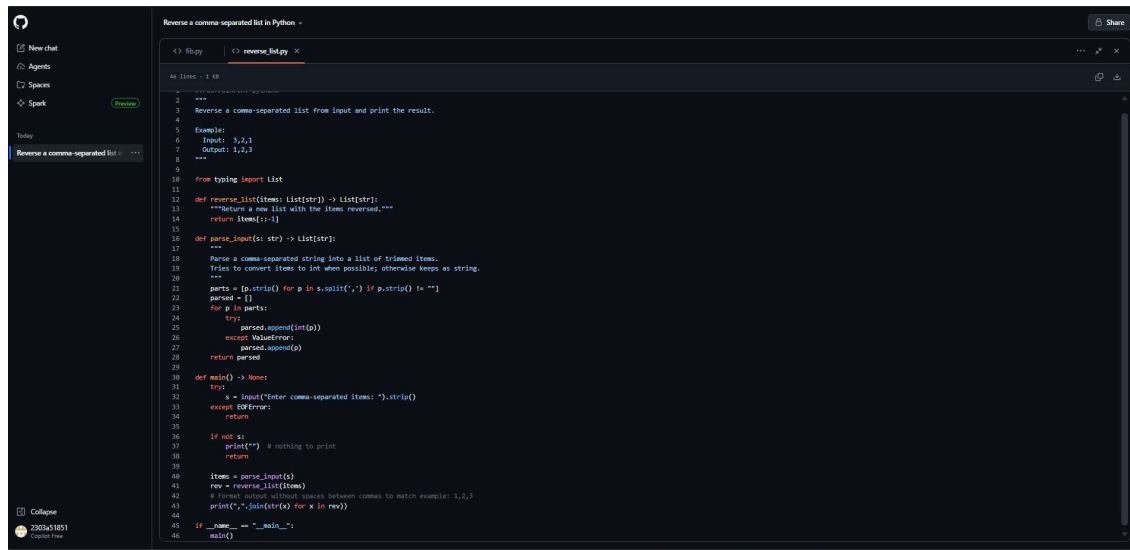
## Task-2. One-shot Prompt – List Reversal Function

### Task Description #2

- Write a comment prompt to reverse a list and provide one example below the comment to guide Copilot.

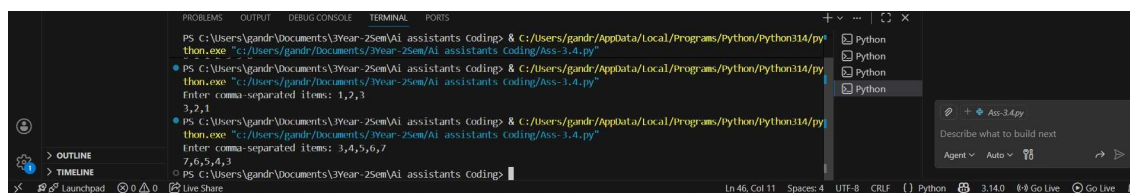
#Now Write a Python code for reverse a list Here Is the Example  
Input:3,2,1 Out Put is 1,2,2,3

Code:



```
Reverse a comma-separated list in Python -
2
3 Reverse a comma-separated list from input and print the result.
4
5 Example:
6 Input: 3,2,1
7 Output: 1,2,3
8
9
10 from typing import List
11
12 def reverse_list(items: List[str]) -> List[str]:
13     """Returns a new list with the items reversed."""
14     return items[::-1]
15
16 def parse_input(s: str) -> List[str]:
17     """
18     Parse a comma-separated string into a list of trimmed items.
19     Tries to convert items to int when possible; otherwise keeps as string.
20     """
21     parts = [p.strip() for p in s.split(',') if p.strip() != '']
22     parsed = []
23     for p in parts:
24         try:
25             parsed.append(int(p))
26         except ValueError:
27             parsed.append(p)
28     return parsed
29
30 def main() -> None:
31     try:
32         s = input("Enter comma-separated items: ").strip()
33     except EOFError:
34         return
35
36     if not s:
37         print("") # nothing to print
38         return
39
40     items = parse_input(s)
41     rev = reverse_list(items)
42     # Format output without spaces between commas to match example: 1,2,3
43     print(",".join(str(x) for x in rev))
44
45 if __name__ == "__main__":
46     main()
```

Output:



```
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding & C:\Users\gandr\AppData\Local\Programs\Python\Python314\python.exe "C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding\Ass-3.4.py"
Enter comma-separated items: 1,2,3
3,2,1
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding & C:\Users\gandr\AppData\Local\Programs\Python\Python314\python.exe "C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding\Ass-3.4.py"
Enter comma-separated items: 3,4,5,6,7
7,6,5,4,3
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding
```

Justification:

By providing one example along with the comment, Copilot clearly understood the expected behavior of the function. The generated code accurately reversed the list using slicing or a loop. The example reduced ambiguity and improved correctness compared to a zero-shot approach.

This shows that even a single example can significantly enhance output quality.

## Task-3. Few-shot Prompt – String Pattern Matching

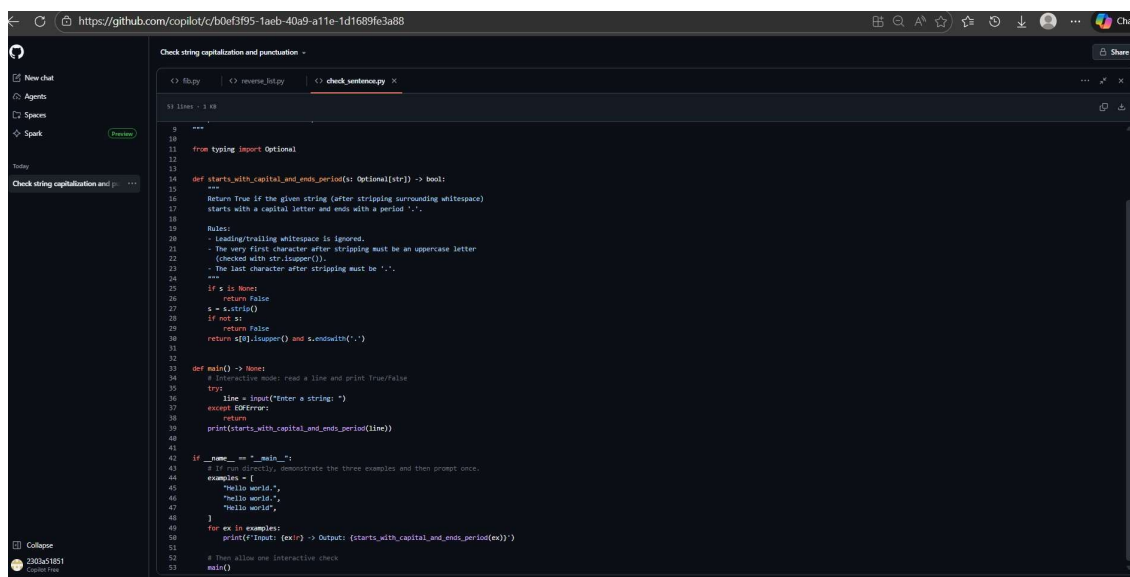
### Task Description #3

- Write a comment with 2–3 examples to help Copilot understand how to check if a string starts with a capital letter and ends with a period.

### Prompt:

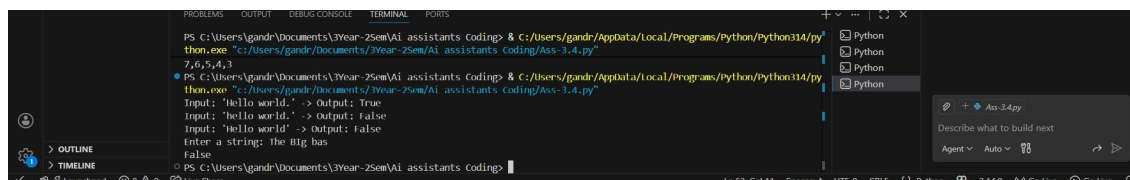
## Write a Python code that checks if a string starts with a capital letter and ends with a period  
Example 1: # Input: "Hello world." # Output: True  
# Example 2: # Input: "hello world." # Output: False # Example 3: # Input: "Hello world" # Output: False

### Code:



```
10 from typing import Optional
11
12 def starts_with_capital_and_ends_period(s: Optional[str]) -> bool:
13     """
14     Return True if the given string (after stripping surrounding whitespace)
15     starts with a capital letter and ends with a period '.'.
16
17     Rules:
18     - Leading/trailing whitespace is ignored.
19     - The very first character after stripping must be an uppercase letter
20       (checked with str.isupper()).
21     - The last character after stripping must be '.'.
22     """
23     if s is None:
24         return False
25     s = s.strip()
26     if not s:
27         return False
28     return s[0].isupper() and s.endswith('.')
29
30 def main() -> None:
31     """Interactive mode: read a line and print True/False"""
32     try:
33         line = input("Enter a string: ")
34     except EOFError:
35         return
36     print(starts_with_capital_and_ends_period(line))
37
38 if __name__ == "__main__":
39     # If run directly, demonstrate the three examples and then prompt once.
40     examples = [
41         "Hello world.",
42         "hello world.",
43         "Hello world",
44     ]
45     for ex in examples:
46         print(f"Input: {ex} -> Output: {starts_with_capital_and_ends_period(ex)}")
47
48 # Then allow one interactive check
49 main()
```

### Output:



```
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding> .\Ass-3.4.py
7,6,5,4,3
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding> .\Ass-3.4.py
Input: 'Hello world.' -> Output: True
Input: 'hello world.' -> Output: False
Input: 'Hello world' -> Output: False
Enter a string: the Big bus
False
```

## Justification:

With 2–3 examples, Copilot was able to identify the exact pattern requirements—starting with a capital letter and ending with a period. The generated `is_valid()` function was more precise and handled conditions correctly. Few-shot prompting guided Copilot to follow strict rules rather than guessing. This highlights how multiple examples help in pattern-based logic.

## Task-4: Zero-shot vs Few-shot – Email Validator

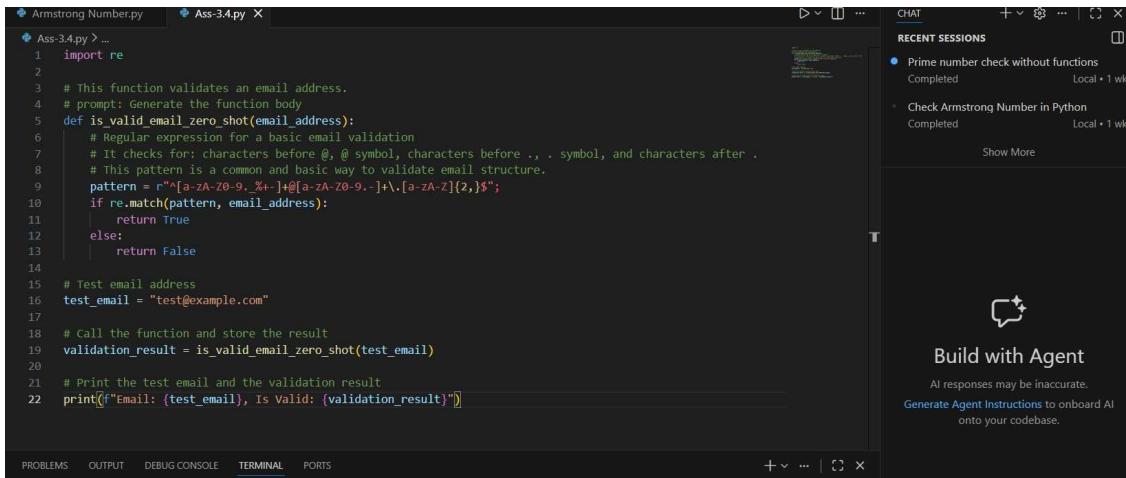
### Task Description #4

- First, prompt Copilot to write an email validation function using zero-shot (just the task in comment).
- Then, rewrite the prompt using few-shot examples.

### Prompt: Zero Short

```
# Write a Python function that validates if a string is a valid email address
```

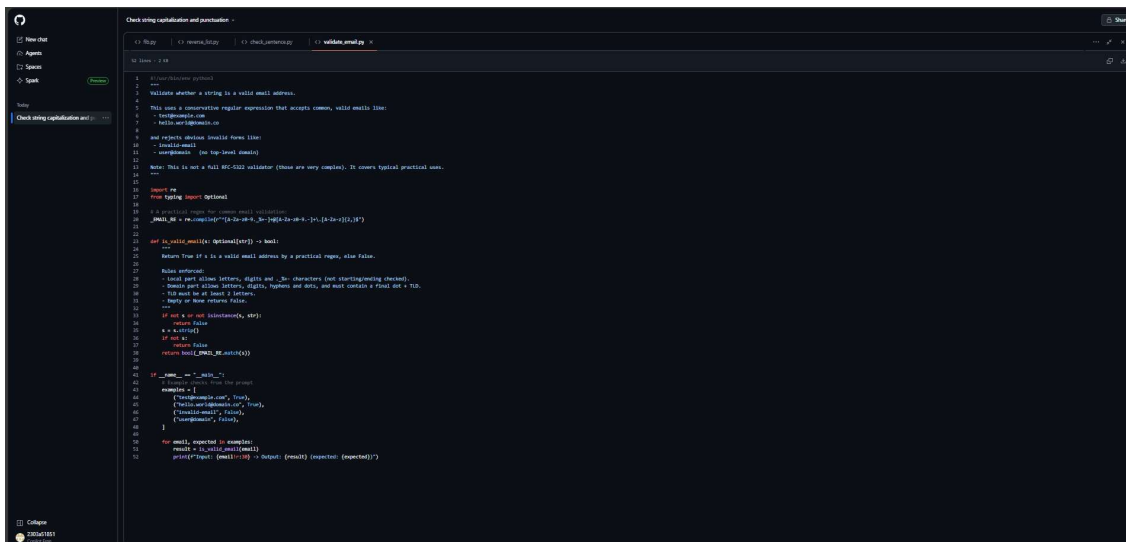
Code:



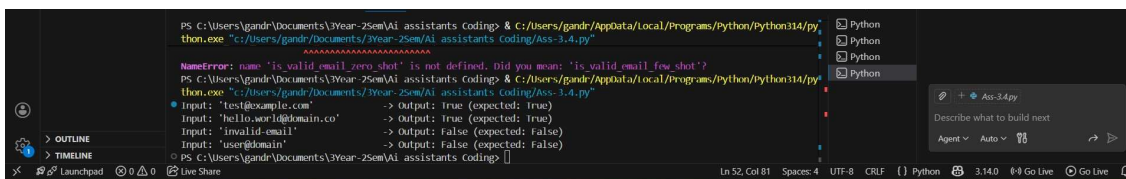
Output:



Code: Few -Short:



Out Put:



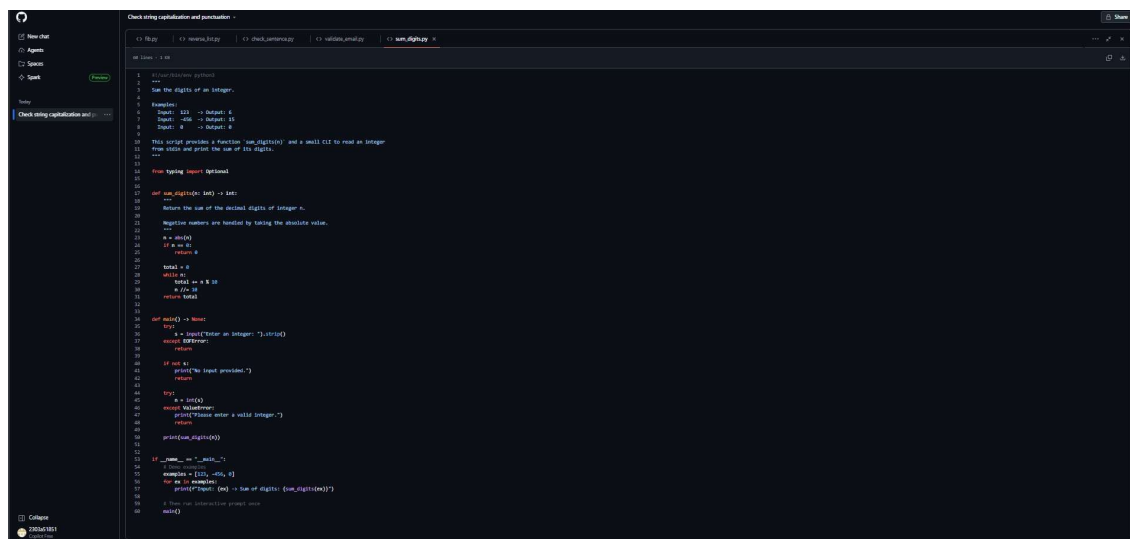
Justification:

The zero-shot prompt resulted in a simple email check with minimal validation logic. In contrast, the few-shot prompt produced a more robust function that checked for proper structure such as @ symbol and domain format. The comparison shows that few-shot prompting improves reliability and reduces logical gaps. Examples help Copilot understand edge cases better.

## Task-5: Prompt Tuning – Summing Digits of a Number

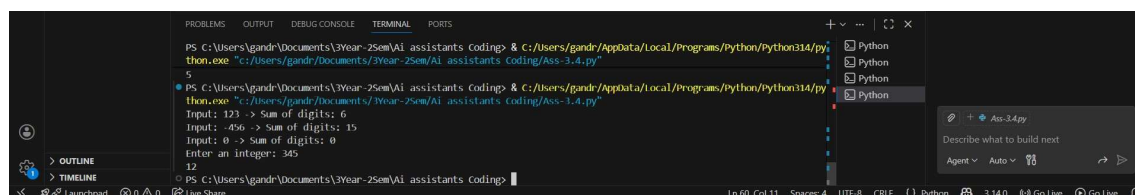
### Task Description #5

- Experiment with 2 different prompt styles to generate a function that returns the sum of digits of a number. Style 1: Generic task prompt  
Style 2: Task + Input/Output example Code:



```
1 # Given a number, calculate the sum of its digits.
2 # Use the digits of an integer.
3
4 Examples:
5 Input: 123 -> Output: 6
6 Input: 456 -> Output: 15
7 Input: 0 -> Output: 0
8
9 This script provides a function sum_digits() and a small CLI to read an integer
10 from stdin and print the sum of its digits.
11
12 From typing import Optional
13
14 def sum_digits(n: int) -> int:
15     """
16     Returns the sum of the decimal digits of integer n.
17
18     Negative numbers are handled by taking the absolute value.
19     """
20     n = abs(n)
21     if n == 0:
22         return 0
23     total = 0
24     while n:
25         total += n % 10
26         n //= 10
27     return total
28
29 def main() -> None:
30     """
31     A small CLI to read an integer from stdin
32     and print the sum of its digits.
33     """
34     if not sys.stdin.isatty():
35         print("No input provided.")
36         return
37     try:
38         n = int(input())
39     except ValueError:
40         print("Please enter a valid integer.")
41         return
42     print(sum_digits(n))
43
44 if __name__ == "__main__":
45     # Run the function
46     examples = [123, 456, 0]
47     for ex in examples:
48         print(f"Input: {ex} -> sum of digits: {sum_digits(ex)}")
49
50 # Run the interactive prompt once
51 main()
```

Out Put:

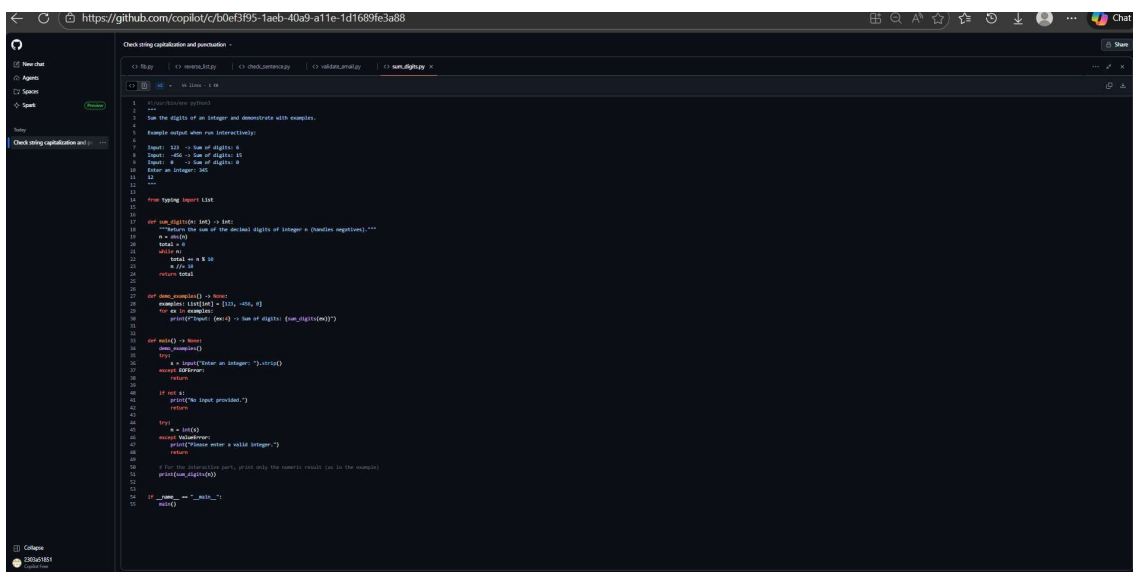


```
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants coding> & C:\Users\gandr\AppData\Local\Programs\Python\Python314\python.exe "c:/Users/gandr/Documents/3Year-2Sem/AI assistants coding/Ass-3.4.py"
5
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants coding> & C:\Users\gandr\AppData\Local\Programs\Python\Python314\python.exe "c:/Users/gandr/Documents/3Year-2Sem/AI assistants coding/Ass-1.4.py"
Input: 123 -> Sum of digits: 6
Input: 456 -> Sum of digits: 15
Input: 0 -> Sum of digits: 0
Enter an integer: 345
12
```

Prompt:

#Ok Now Write a Python code to Summing Digits of a Number  
Input: 123 -> Sum of digits: 6  
Input: -456 -> Sum of digits: 15  
Input: 0 -> Sum of digits: 0  
Enter an integer: 345 12

Code:



```
1 #!/usr/bin/env python
2 """
3 Sum the digits of an integer and demonstrate with examples.
4 """
5 # Example usage:
6 # Input: 123 -> Sum of digits: 6
7 # Input: -456 -> Sum of digits: 15
8 # Input: 0 -> Sum of digits: 0
9 # Enter an integer: 345
10 # Output: 12
11 """
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were added, Copilot produced cleaner, more readable, and more accurate code. The example clarified expectations and improved function structure. This confirms that prompt tuning with examples leads to better-quality implementations.