

# AI ASSISTED CODING

Hall Ticket No: 2303A51851

Batch:13

## Assignment - 3.4

### Task-1. Zero-shot Prompt – Fibonacci Series Generator

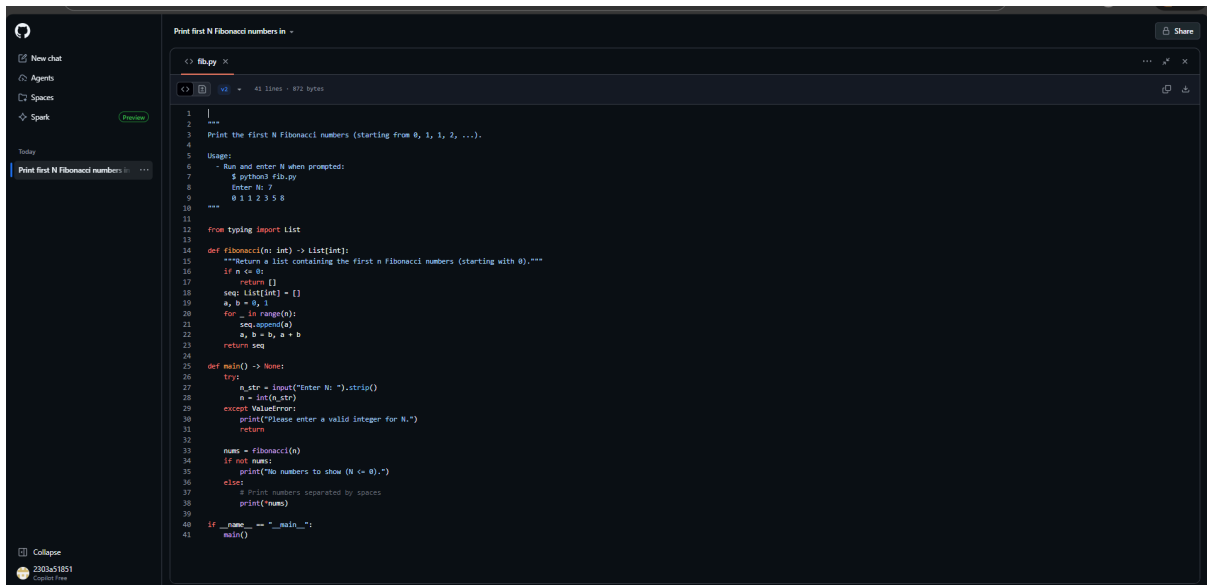
#### Task Description :

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 :

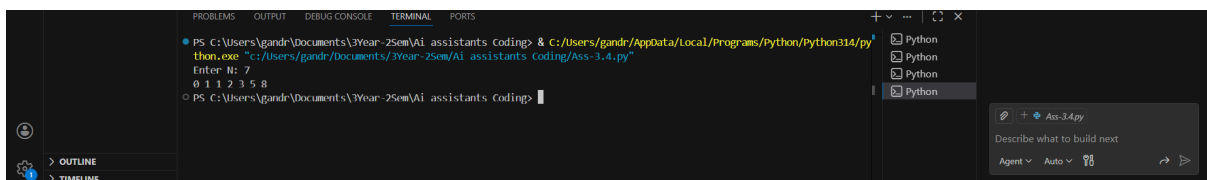
**# Write a Python code that prints the first N Fibonacci numbers**

#### 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 |   $ python3 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 |     nums = fibonacci(n)  
33 |     if not nums:  
34 |         print("No numbers to show (N <= 0).")  
35 |     else:  
36 |         # Print numbers separated by spaces  
37 |         print(' '.join(str(num) for num in nums))  
38 |  
39 | if __name__ == "__main__":  
40 |     main()  
41 |
```

## 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

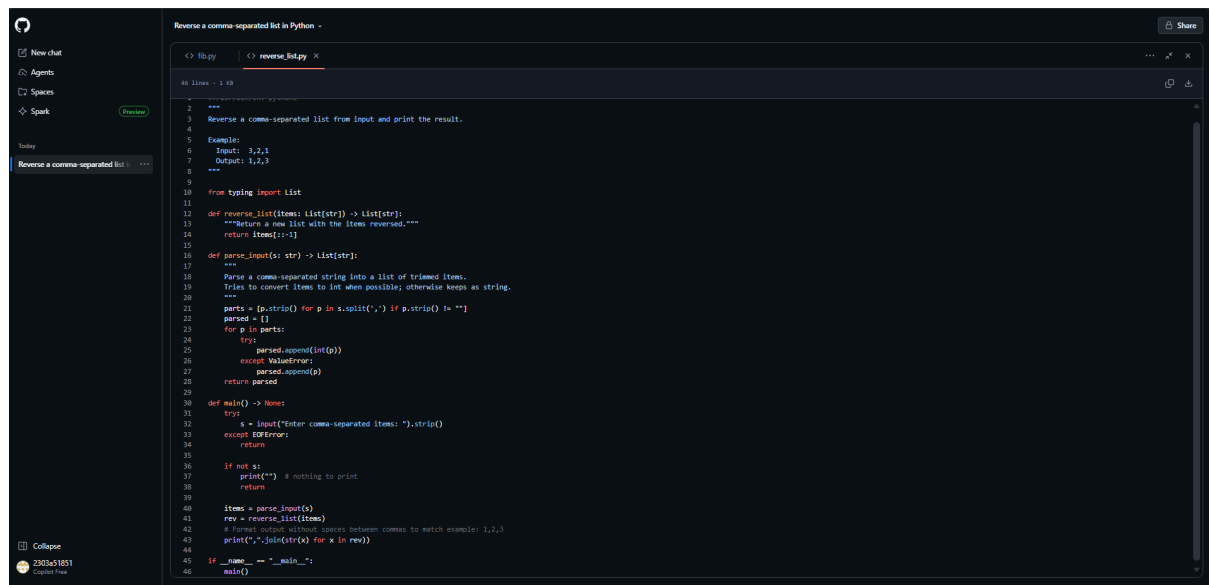
- Write a comment prompt to reverse a list and provide one

example below the comment to guide Copilot.

#Now Write a Python code for reverse a list Here Is the Example

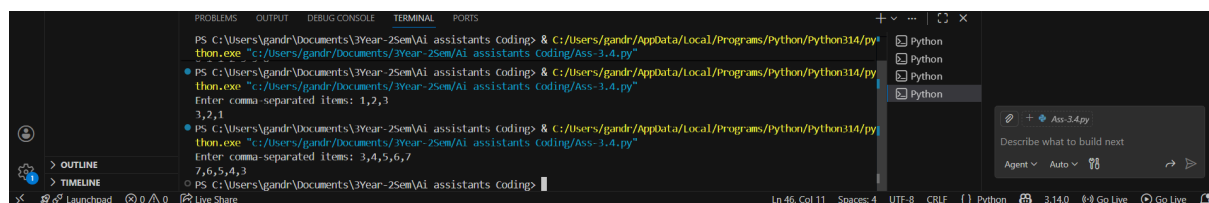
Input:3,2,1 Out Put is 1,2,3

Code:



```
Reverse a comma-separated list in Python -  
46 lines - 1 KB  
2 """  
3 Reverse a comma-separated list from input and print the result.  
4  
5 Examples:  
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     """Return 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"  
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

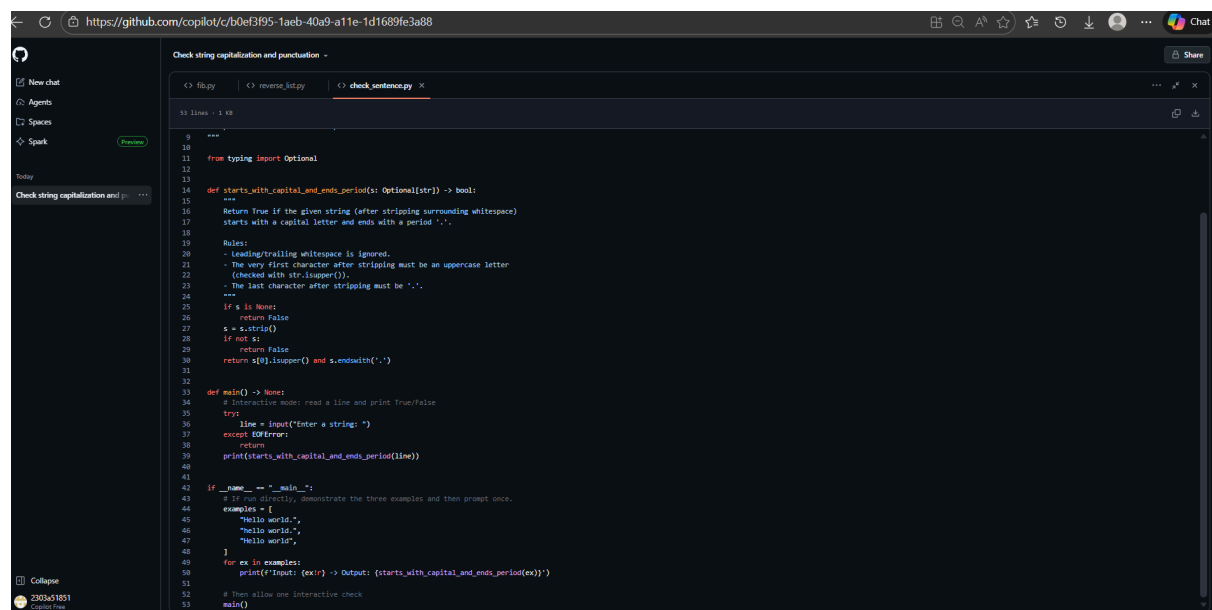
- Write a comment with 2–3 examples to help Copilot understand

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:



```
1  """
2  Check string capitalization and punctuation
3  """
4
5  from typing import Optional
6
7  def starts_with_capital_and_ends_period(s: Optional[str]) -> bool:
8      """
9      Return True if the given string (after stripping surrounding whitespace)
10      starts with a capital letter and ends with a period '.',
11      """
12      Rules:
13      - Leading/trailing whitespace is ignored.
14      - The very first character after stripping must be an uppercase letter
15      (checked with str.isupper()).
16      - The last character after stripping must be '.'.
17      """
18      if s is None:
19          return False
20      s = s.strip()
21      if not s:
22          return False
23      return s[0].isupper() and s.endswith('.')
24
25  def main() -> None:
26      """Interactive mode: read a line and print True/False"""
27      try:
28          line = input("Enter a string: ")
29      except EOFError:
30          return
31      print(starts_with_capital_and_ends_period(line))
32
33  if __name__ == "__main__":
34      # If run directly, demonstrate the three examples and then prompt once.
35      examples = [
36          "Hello world.",
37          "hello world.",
38          "Hello world",
39      ]
40      for ex in examples:
41          print(f"Input: {ex} -> Output: {starts_with_capital_and_ends_period(ex)}")
42
43      # Then allow one interactive check
44      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"
7,6,5,4,3
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"
Input: 'Hello world.' -> Output: True
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

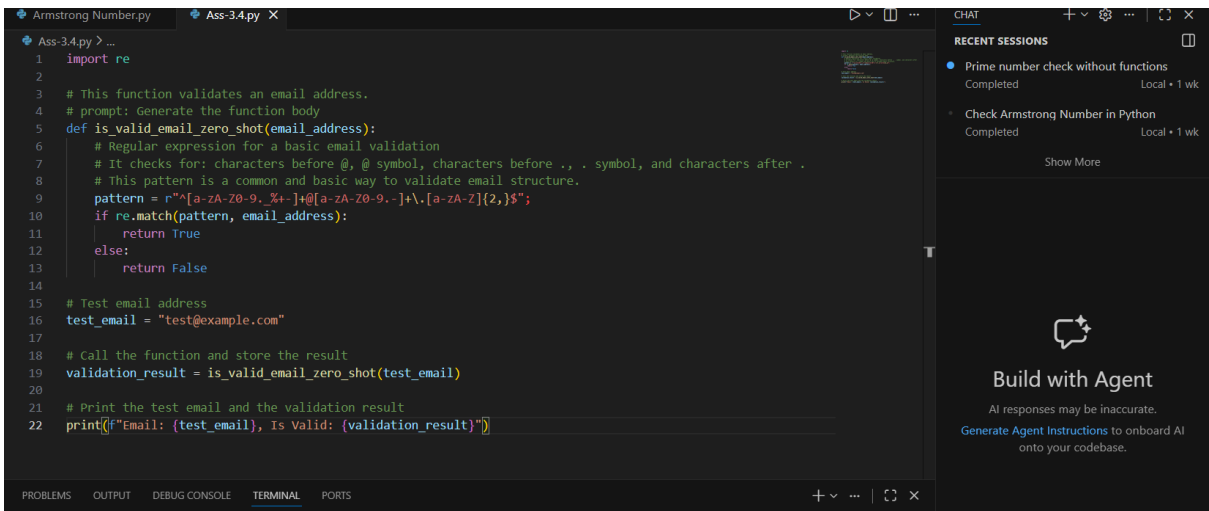
### Task Description #4

- 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.

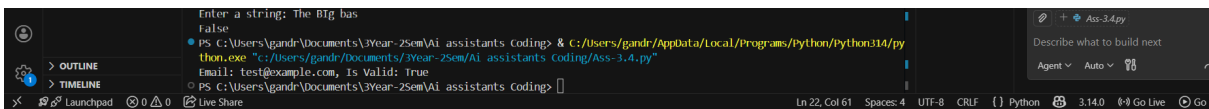
### Prompt: Zero Short

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

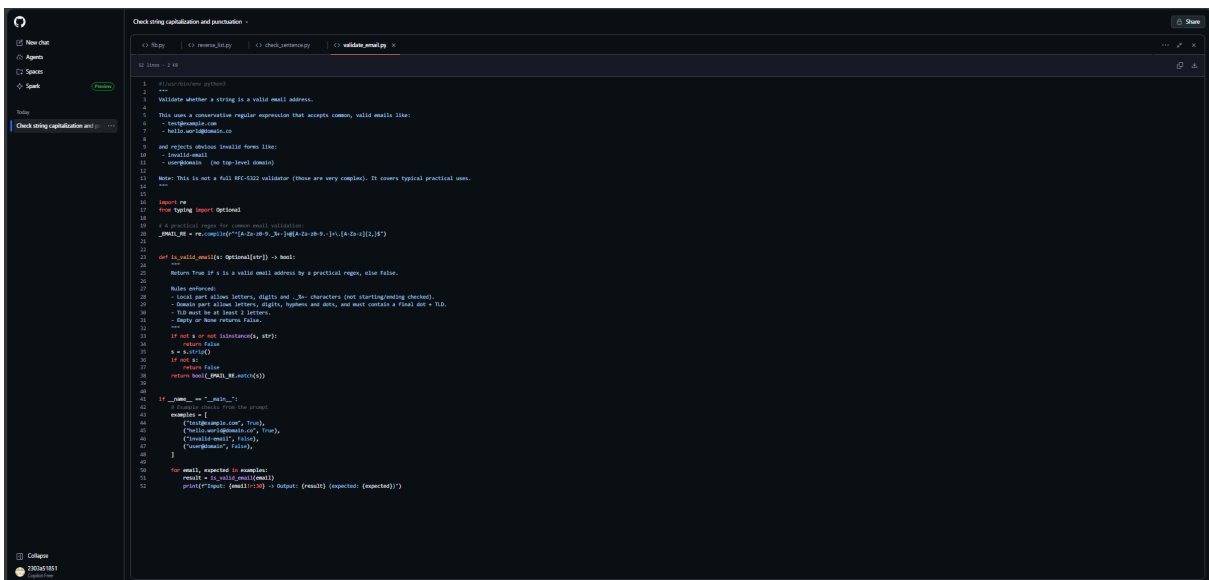
Code:



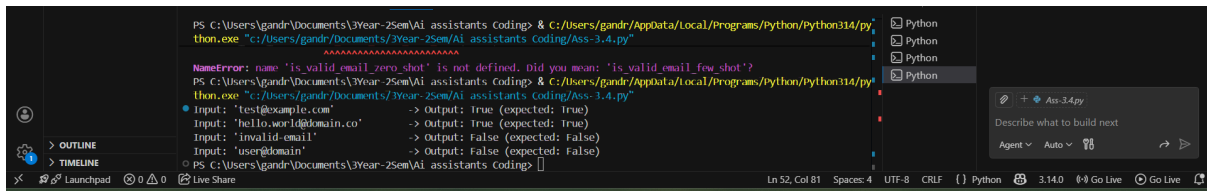
Output:



Code: Few -Short:



Out Put:



```
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"
NameError: name 'is_valid_email_zero_shot' is not defined. Did you mean: 'is_valid_email_few_shot'?
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"
Input: 'test@example.com' -> Output: True (expected: True)
Input: 'hello.world@domain.co' -> Output: True (expected: True)
Input: 'invalid-email' -> Output: False (expected: False)
Input: 'user@domain' -> Output: False (expected: False)
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants Coding>
```

## 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 #!/usr/bin/env python
2 """
3 Sum the digits of an integer.
4 """
5 Examples:
6 Input: 123 -> Output: 6
7 Input: -456 -> Output: 15
8 Input: 0 -> Output: 0
9
10 This script provides a function 'sum_digits()' and a small CLI to read an integer
11 from stdin and print the sum of its digits.
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```



The screenshot shows a GitHub Copilot interface with a Python script in the editor. The script is titled "sum\_digits.py" and contains the following code:

```
1 """Sum of digits"""
2 """
3 Sum the digits of an integer and demonstrate with examples.
4
5 Example output when run interactively:
6
7 Input: 123 -> Sum of digits: 6
8 Input: -456 -> Sum of digits: 15
9 Input: 0 -> Sum of digits: 0
10 Enter an integer: 145
11 11
12 """
13
14 from typing import List
15
16 def sum_digits(n: int) -> int:
17     """Returns the sum of the decimal digits of integer n (handles negatives)."""
18     n = abs(n)
19     total = 0
20     while n:
21         total += n % 10
22         n //= 10
23     return total
24
25 def show_examples() -> None:
26     examples: List[int] = [11, -45, 0]
27     for n in examples:
28         print(f"Input: {n} -> Sum of digits: {sum_digits(n)}")
29
30 def main() -> None:
31     show_examples()
32     try:
33         n = input("Enter an integer: ").strip()
34         n = int(n)
35         print(f"Sum of digits: {sum_digits(n)}")
36     except ValueError:
37         print("Please enter a valid integer.")
38
39 if __name__ == "__main__":
40     main()
```

## Out Put:

The screenshot shows a terminal window with the following output:

```
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants coding> ^C
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants coding> ^C
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants coding>
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants coding> & C:/Users/gandr/appdata/local/Programs/python/python314/py
then.exe "C:/Users/gandr/Documents/3Year-2Sem/AI assistants coding/Ass-3.4.py"
Input: 123 -> Sum of digits: 6
Input: -456 -> Sum of digits: 15
Input: 0 -> Sum of digits: 0
Enter an integer: 234
9
PS C:\Users\gandr\Documents\3Year-2Sem\AI assistants coding>
```

## Justification:

The generic prompt generated a working but straightforward solution. When input/output examples 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.