

## Assignment-3.4

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

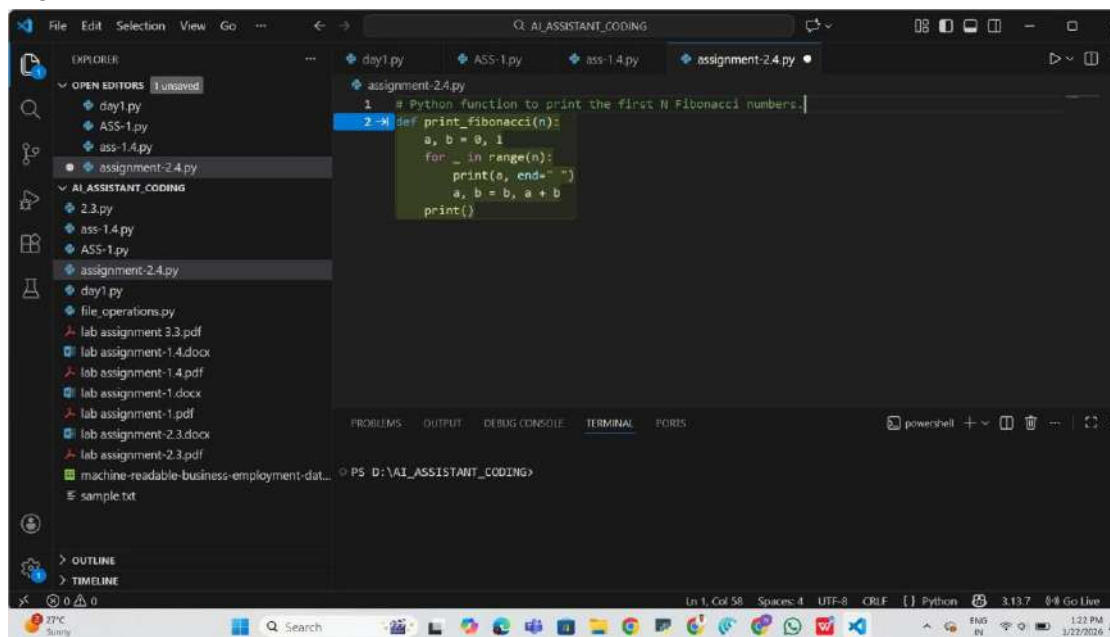
#### Task Description #1

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

#### Expected Output #1

- A complete Python function generated by Copilot without any example provided.
- Correct output for sample input N = 7 → 0 1 1 2 3 5 8
- Observation on how Copilot understood the instruction with zero Context

#### PROMPT:



#### CODE:

```
def fibonacci_sequence(n):
    """
    Generates the first N Fibonacci numbers.

    Args: n: Integer, number of Fibonacci numbers to
    generate

    Returns:
        List of first N Fibonacci numbers
    """
    fib_sequence = []
    a, b = 0, 1
    for _ in range(n):
        fib_sequence.append(a)
        a, b = b, a + b
    return fib_sequence

for i in range(2, int(n ** 0.5) + 1):
    if n % i == 0:
        return False
```

```

    return True return True # Test the function num = int(input("Enter
the number of Fibonacci numbers to generate: ")) fib_numbers =
fibonacci_sequence(num)
print(f"The first {num} Fibonacci numbers are: {fib_numbers}")

```

OUTPUT :

```

PS D:\AI_ASSISTANT_CODING> & "C:/Users/Ashanti sal teja/AppData/Local/Programs/Python/Python313/python.exe" d:/AI_ASSISTANT_CODING/assignment-2.4.py
PS D:\AI_ASSISTANT_CODING> & "C:/Users/Ashanti sal teja/AppData/Local/Programs/Python/Python313/python.exe" d:/AI_ASSISTANT_CODING/assignment-2.4.py
PS D:\AI_ASSISTANT_CODING> & "C:/Users/Ashanti sal teja/AppData/Local/Programs/Python/Python313/python.exe" d:/AI_ASSISTANT_CODING/assignment-2.4.py
Enter the number of Fibonacci numbers to generate: 7
The first 7 Fibonacci numbers are: [0, 1, 1, 2, 3, 5, 8]
PS D:\AI_ASSISTANT_CODING>

```

## Task2: 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.

### Expected Output #2

- Copilot-generated function to reverse a list using slicing or loop.
- Output: [3, 2, 1] for input [1, 2, 3]
- Observation on how adding a single example improved Copilot's accuracy.

### PROMPT:

```

26 fib_numbers = fibonacci_sequence(num)
27 print(f"The first {num} Fibonacci numbers are: {fib
28
29 # Reverse a list by using an example of your choice.

```

### CODE:

```

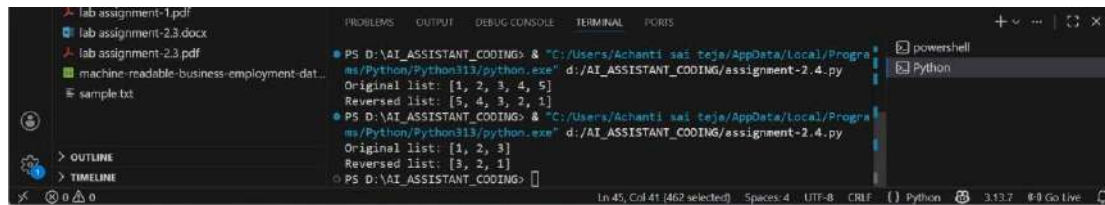
# Reverse a list by using an example of your choice
def reverse_list(input_list): """
    Reverses the given list.

    Args: input_list: List of elements to be
        reversed

    Returns:
        List: Reversed list
    """ return input_list[::-1] # Test
the reverse_list function sample_list =
[1, 2, 3] reversed_list =
reverse_list(sample_list)
print(f"Original list: {sample_list}")
print(f"Reversed list: {reversed_list}")

```

OUTPUT:



Adding **just one clear example** helps Copilot quickly infer:

- what the function should do the
- expected input and output format

This improves **accuracy and reduces ambiguity**, even with a minimal prompt.

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

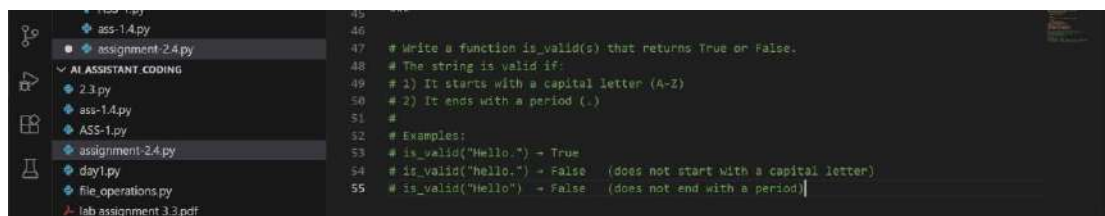
#### Task Description #3

- 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.

#### Expected Output #3

- A function `is_valid()` that checks the pattern.
- Output: True or False based on input.
- Students reflect on how multiple examples guide Copilot to generate more accurate code.

#### PROMPT:



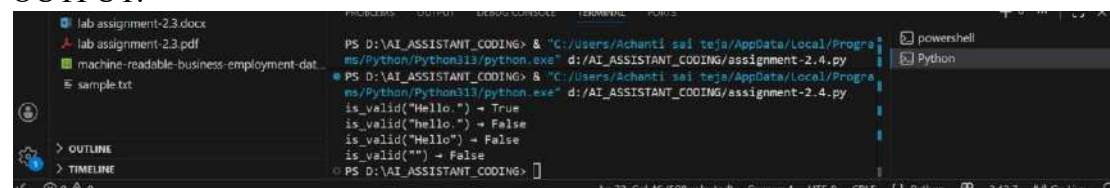
#### CODE:

```
def is_valid(s):
    """
    Checks if the string starts with a capital letter and ends with a period.

    Args: s: Input string to
    validate Returns:
        Boolean: True if valid, False otherwise
    """
    if len(s) == 0:
        return False
    return s[0].isupper() and s[-1] == '.'

# Test the is_valid function test_strings =
["Hello.", "hello.", "Hello", ""] for string in
test_strings:
    result = is_valid(string)
    print(f'is_valid("{string}") → {result}')
```

OUTPUT:



```
PS D:\AI_ASSISTANT_CODING> & "C:/Users/Achanti sai teja/AppData/Local/Programs/Python/Python313/python.exe" d:/AI_ASSISTANT_CODING/assignment-2.4.py
is_valid("Hello.") → True
is_valid("hello.") → False
is_valid("Hello") → False
is_valid("") → False
PS D:\AI_ASSISTANT_CODING>
```

Providing **multiple examples in comments** helps Copilot clearly understand:

- what counts as valid

- what should be rejected

This leads to **more accurate and relevant code generation**.

#### 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.

##### Expected Output #4

- Compare both outputs:

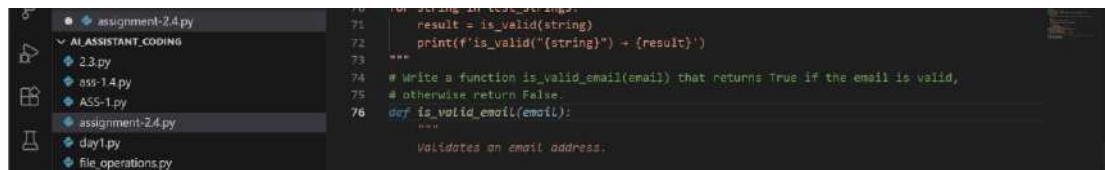
Zero-shot may result in basic or generic validation.

Few-shot gives detailed and specific logic (e.g., @ and domain checking).

- Submit both code versions and note how few-shot improves

reliability.

PROMPT:



```
70 for string in test_strings:
71     result = is_valid(string)
72     print(f'is_valid("{string}") -> {result}')
73
74 # Write a function is_valid_email(email) that returns True if the email is valid,
75 # otherwise return False.
76 def is_valid_email(email):
77     """
78     Validates an email address.
79     """
```

CODE:

```
def is_valid_email(email):
    """
    Validates an email address based on basic criteria.

    Args: email: String, email address to
           validate

    Returns:
        Boolean: True if valid, False otherwise
    """
    # Basic checks for presence of '@' and '.'
    if "@" not in email or "." not in email:
        return False

    # Split the email into local and domain parts
    local_part, domain_part = email.split("@", 1)

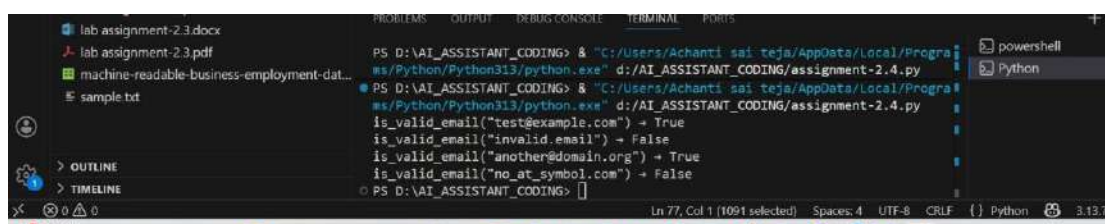
    # Local part should not be empty
    if len(local_part) == 0:
        return False

    # Domain part should contain at least one dot
    if "." not in domain_part:
        return False

    # Domain part should not start or end with a dot if
    domain_part.startswith(".") or domain_part.endswith("."):
        return False

    return True
# Test the is_valid_email function
test_emails = ["test@example.com", "invalid.email", "another@domain.org",
               "no_at_symbol.com"]
for email in test_emails:
    result = is_valid_email(email)
    print(f'is_valid_email("{email}") -> {result}')
```

OUTPUT:



```
PS D:\AI_ASSISTANT_CODING> & "C:/Users/Achanti sai teja/AppData/Local/Programs/Python/Python313/python.exe" d:/AI_ASSISTANT_CODING/assignment-2.4.py
PS D:\AI_ASSISTANT_CODING> & "C:/Users/Achanti sai teja/AppData/Local/Programs/Python/Python313/python.exe" d:/AI_ASSISTANT_CODING/assignment-2.4.py
is_valid_email("test@example.com") -> True
is_valid_email("invalid.email") -> False
is_valid_email("another@domain.org") -> True
is_valid_email("no_at_symbol.com") -> False
PS D:\AI_ASSISTANT_CODING>
```

## PROMPT:



```
112 # Write a function is_valid_email(email) that checks whether an email is valid
113 # Rules:
114 # - Must contain exactly one '@'
115 # - Must have characters before and after '@'
116 # - Must end with a valid domain containing '.'
117 # Examples:
118 # is_valid_email("user@example.com") → True
119 # is_valid_email("userexample.com") → False
120 # is_valid_email("user@com") → False
121
```

## CODE:

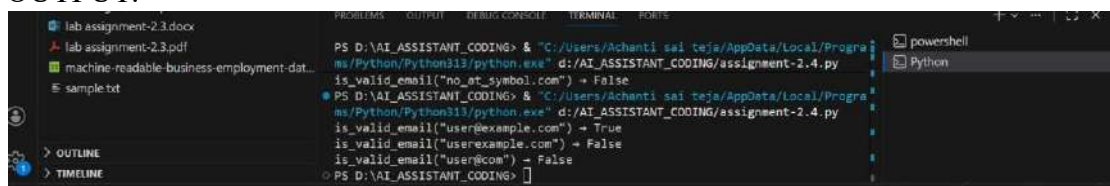
```
def is_valid_email(email):
    if email.count("@") != 1:
        return False

    local, domain = email.split("@")
    if not local or "." not in domain:
        return False

    return True

# Test the is_valid_email function
test_emails = ["user@example.com", "userexample.com", "user@com"]
for email in test_emails:
    result = is_valid_email(email)
    print(f'is_valid_email("{email}") → {result}')
```

## OUTPUT:



```
PS D:\AI_ASSISTANT_CODING> "C:/Users/Achanti sai teja/AppData/Local/Programs/Python/Python313/python.exe" d:/AI_ASSISTANT_CODING/assignment-2.4.py
is_valid_email("no_at_symbol.com") → False
PS D:\AI_ASSISTANT_CODING> "C:/Users/Achanti sai teja/AppData/Local/Programs/Python/Python313/python.exe" d:/AI_ASSISTANT_CODING/assignment-2.4.py
is_valid_email("user@example.com") → True
is_valid_email("userexample.com") → False
is_valid_email("user@com") → False
PS D:\AI_ASSISTANT_CODING>
```

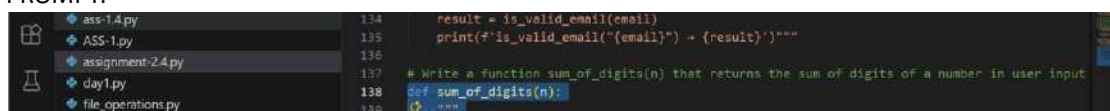
Few-shot prompting **guides Copilot's reasoning** by showing:

valid vs invalid patterns

edge cases

This results in **more reliable, accurate, and meaningful code** compared to zero-shot prompts.

## PROMPT:



```
134 result = is_valid_email(email)
135 print(f'is_valid_email("{email}") → {result}')
```

```
137 # Write a function sum_of_digits(n) that returns the sum of digits of a number in user input
138 def sum_of_digits(n):
139     """
```

## CODE:

```
def sum_of_digits(n):
    """
    Calculates the sum of digits of a given number.

    Args: n: Integer whose digits are to be
           summed

    Returns:
        Integer: Sum of the digits
    """
    return sum(int(digit) for digit in
               str(abs(n)))

# Test the sum_of_digits function
number = int(input("Enter a number to
calculate the sum of its digits: "))
result = sum_of_digits(number)
print(f"The sum of the digits of {number} is: {result}")
```

OUTPUT:

```
is_valid_email("user@example.com") → False
is_valid_email("user@com") → False
PS D:\AI_ASSISTANT_CODING> "C:/Users/Achanti sai teja/AppData/Local/Programs/Python/Python313/python.exe" d:/AI_ASSISTANT_CODING/assignment-2.4.py
Enter a number to calculate the sum of its digits: 123
The sum of the digits of 123 is: 6
PS D:\AI_ASSISTANT_CODING>
```

PROMPT:

```
154 """
155 # Write a function sum_of_digits(n) that returns the sum of all digits in a number.
156 # Example:
157 # sum_of_digits(123) → 6
```

CODE:

```
155 # Write a function sum_of_digits(n) that returns the sum of all digits in a number.
156 # Example:
157 # sum_of_digits(123) → 6
158 def sum_of_digits(n):
159     return sum(int(digit) for digit in str(abs(n)))
160 # Test the sum_of_digits function
161 test_numbers = [123]
162 for number in test_numbers:
163     result = sum_of_digits(number)
164     print(f"sum_of_digits({number}) → {result}")
165
```

OUTPUT:

```
Enter a number to calculate the sum of its digits: 123
The sum of the digits of 123 is: 6
PS D:\AI_ASSISTANT_CODING> "C:/Users/Achanti sai teja/AppData/Local/Programs/Python/Python313/python.exe" d:/AI_ASSISTANT_CODING/assignment-2.4.py
sum_of_digits(123) → 6
PS D:\AI_ASSISTANT_CODING>
```

