Assignment-3.4

Task 1: Zero-shot Prompt – Fibonacci Series Generator

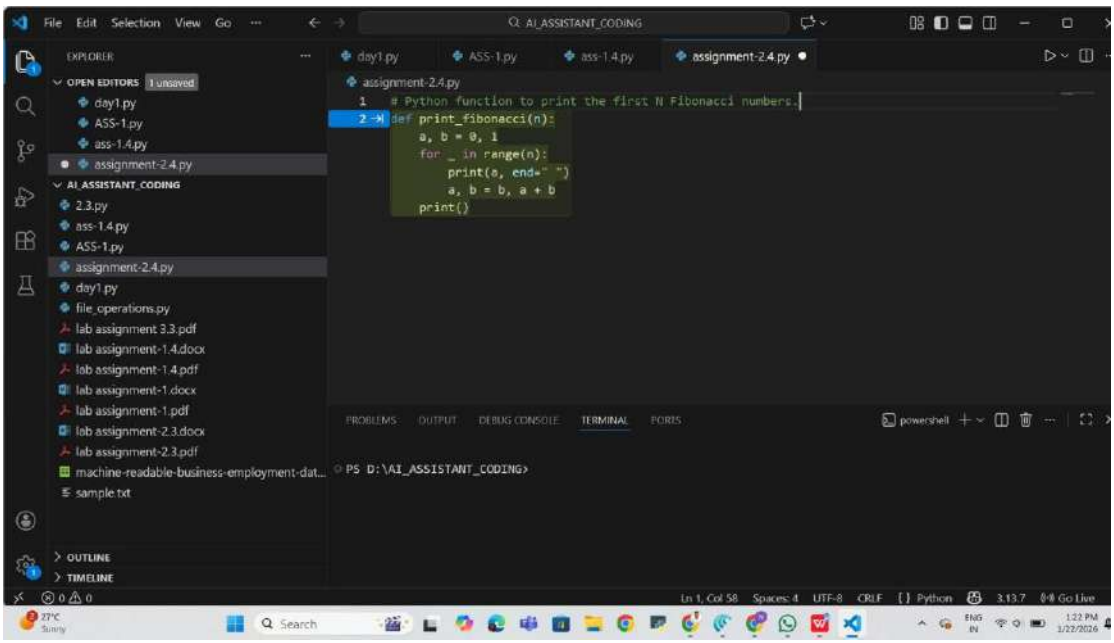
Task Description #1

- 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:

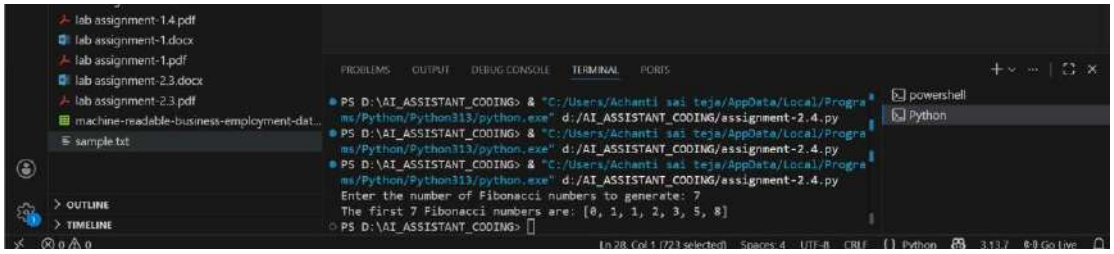


CODE:

```
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 :



Task2: One-shot Prompt – List Reversal Function

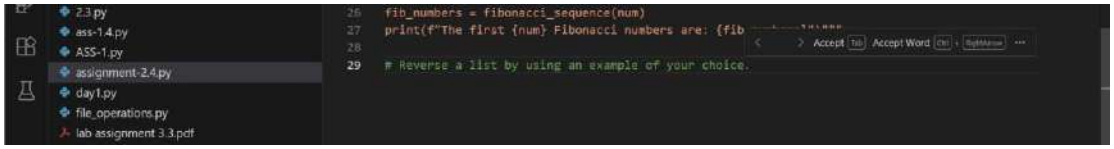
Task Description #2

- 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.

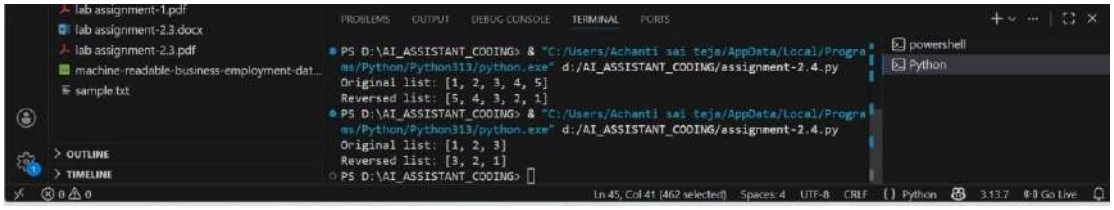
PROMPT:



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

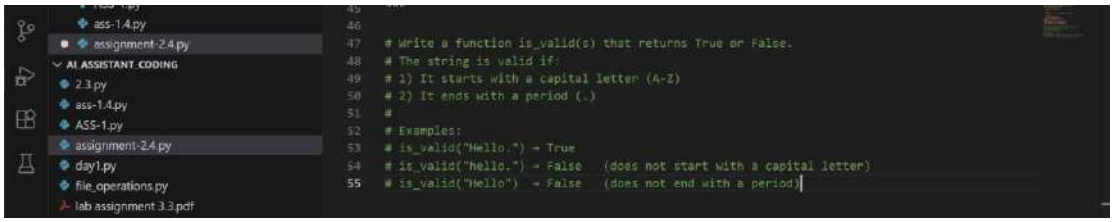
• A function is_valid() that checks the pattern.

• Output: True or False based on input.

• Students reflect on how multiple examples guide Copilot to generate

more accurate code.

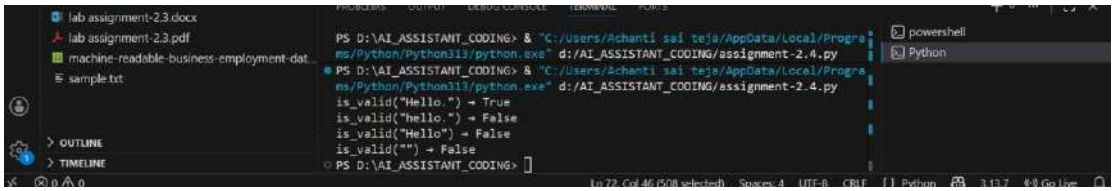
PROMPT:



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:



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.

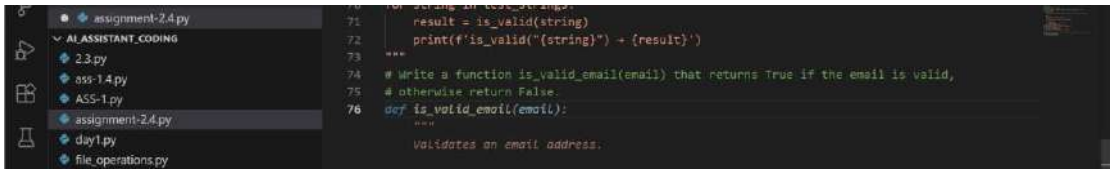
Few-shot gives detailed and specific logic (e.g., @ and domain

checking).

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

reliability.

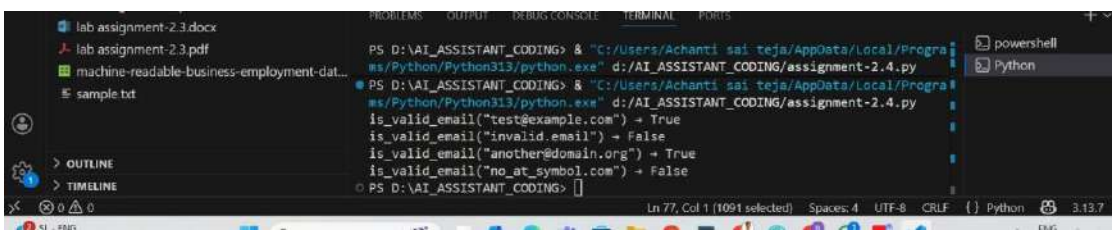
PROMPT:



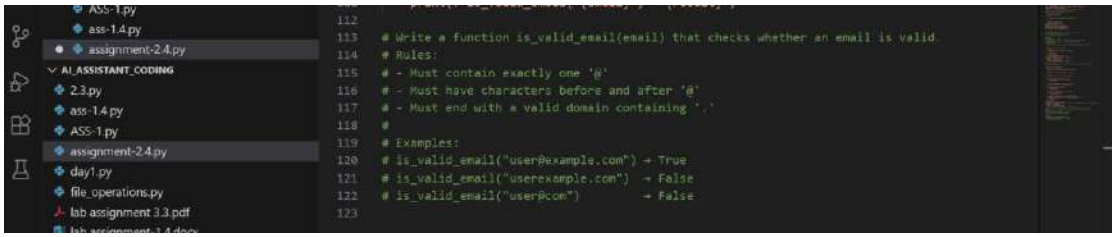
CODE:

```
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:



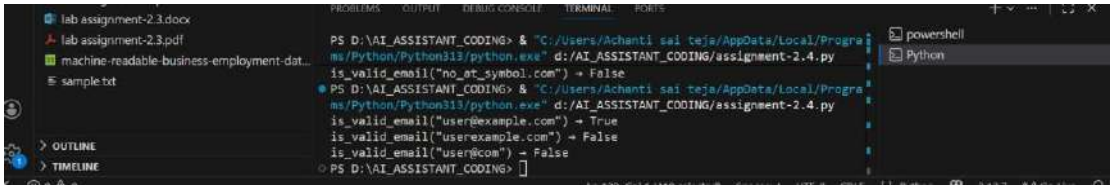
PROMPT:



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:



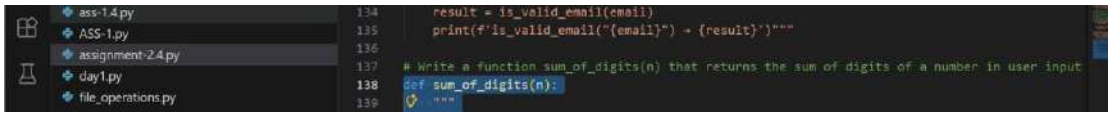
Few-shot prompting **guides Copilot's reasoning** by showing:

valid vs invalid patterns

edge cases

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

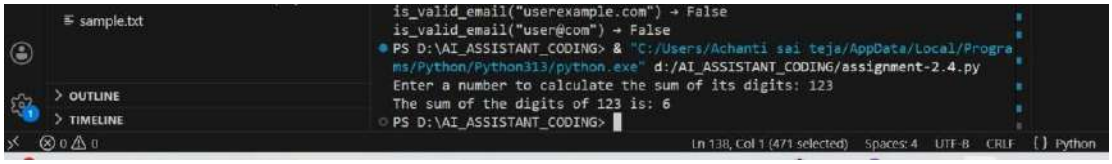
PROMPT:



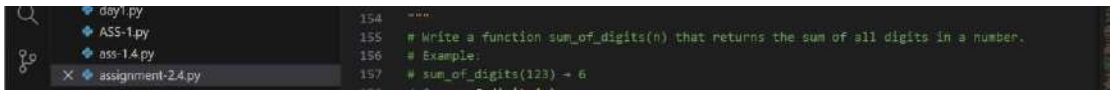
CODE:

```
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}")
```

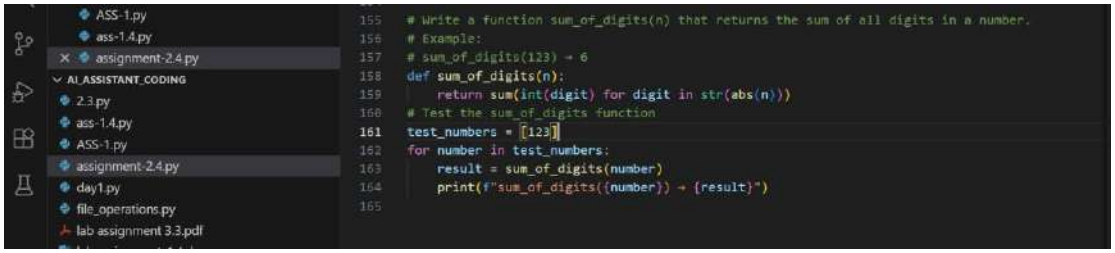
OUTPUT:



PROMPT:



CODE:



OUTPUT: