ASSIGNMENT - 3.4

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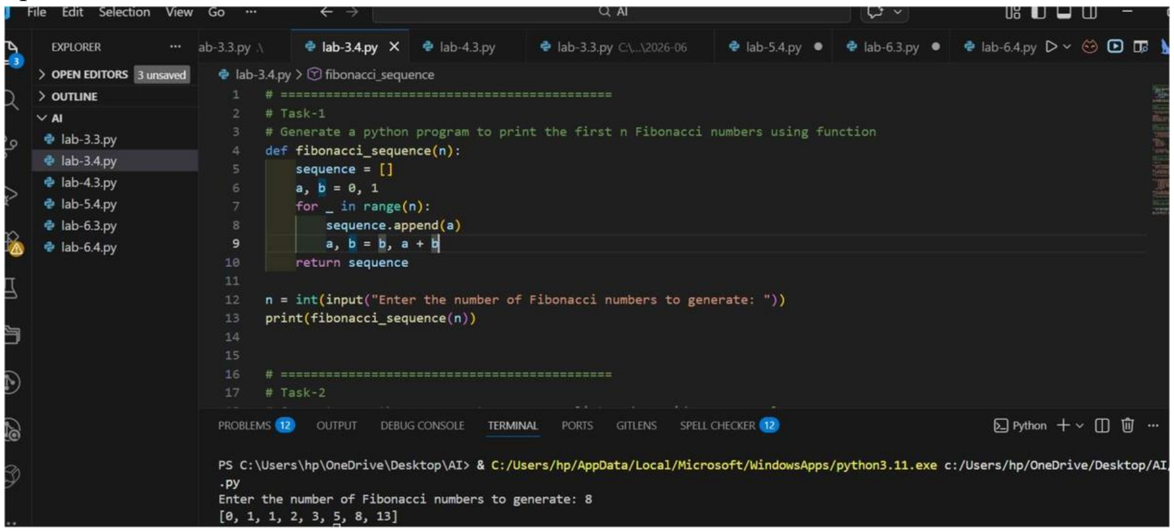
Batch-10

Task-1

Prompt: generate a Python program to print the first n Fibonacci numbers using a function without giving an example Code:

```
def fibonacci_sequence(n):      sequence = []     a, b = 0, 1      for _ in
range(n):         sequence.append(a)         a, b = b, a + b     return
sequence # Example usage n = int(input("Enter the number of
Fibonacci numbers to generate: ")) fib_sequence =
fibonacci_sequence(n) print(f"The first {n} Fibonacci numbers are:
{fib_sequence}")
```

Output :



```python
# ==========================================
# Task-1
# Generate a python program to print the first n Fibonacci numbers using function
def fibonacci_sequence(n):
    sequence = []
    a, b = 0, 1
    for _ in range(n):
        sequence.append(a)
        a, b = b, a + b
    return sequence

n = int(input("Enter the number of Fibonacci numbers to generate: "))
print(fibonacci_sequence(n))


# ==========================================
# Task-2
```

```
PS C:\Users\hp\OneDrive\Desktop\AI> & C:/Users/hp/AppData/Local/Microsoft/WindowsApps/python3.11.exe c:/Users/hp/OneDrive/Desktop/AI
.py
Enter the number of Fibonacci numbers to generate: 8
[0, 1, 1, 2, 3, 5, 8, 13]
```

Code Analysis :

- The function fibonacci_sequence(n) generates Fibonacci numbers iteratively.
- Variables a and b store the previous two Fibonacci values.
- A for loop runs n times to generate required numbers.
- Each generated number is stored in a list for easy return.

- Function-based approach improves reusability and clarity.

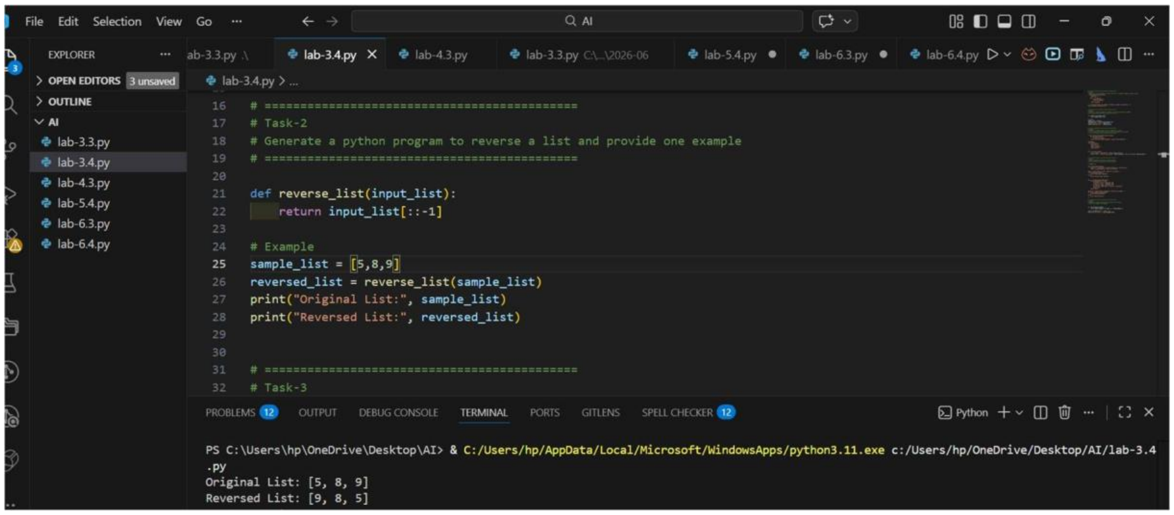
Task-2

Prompt: generate a Python program to reverse a list and provide one example

Code:

```
def reverse_list(input_list):
return input_list[::-1]
# Example usage sample_list = [1, 2, 3] reversed_list
= reverse_list(sample_list) print(f"Original List:
{sample_list}") print(f"Reversed List:
{reversed_list}")
```

Output :



```
# ==========================================
# Task-2
# Generate a python program to reverse a list and provide one example
# ==========================================

def reverse_list(input_list):
    return input_list[::-1]

# Example
sample_list = [5,8,9]
reversed_list = reverse_list(sample_list)
print("Original List:", sample_list)
print("Reversed List:", reversed_list)


# ==========================================
# Task-3
```

```
PS C:\Users\hp\OneDrive\Desktop\AI> & C:/Users/hp/AppData/Local/Microsoft/WindowsApps/python3.11.exe c:/Users/hp/OneDrive/Desktop/AI/lab-3.4
.py
Original List: [5, 8, 9]
Reversed List: [9, 8, 5]
```

Code Analysis :

- The function reverse_list() accepts a list as input.
- Python slicing [::-1] is used for efficient reversal.
- No additional loop or memory-intensive operations are required.
- Original list remains unchanged, ensuring data safety.
- Function allows reuse for any list input.

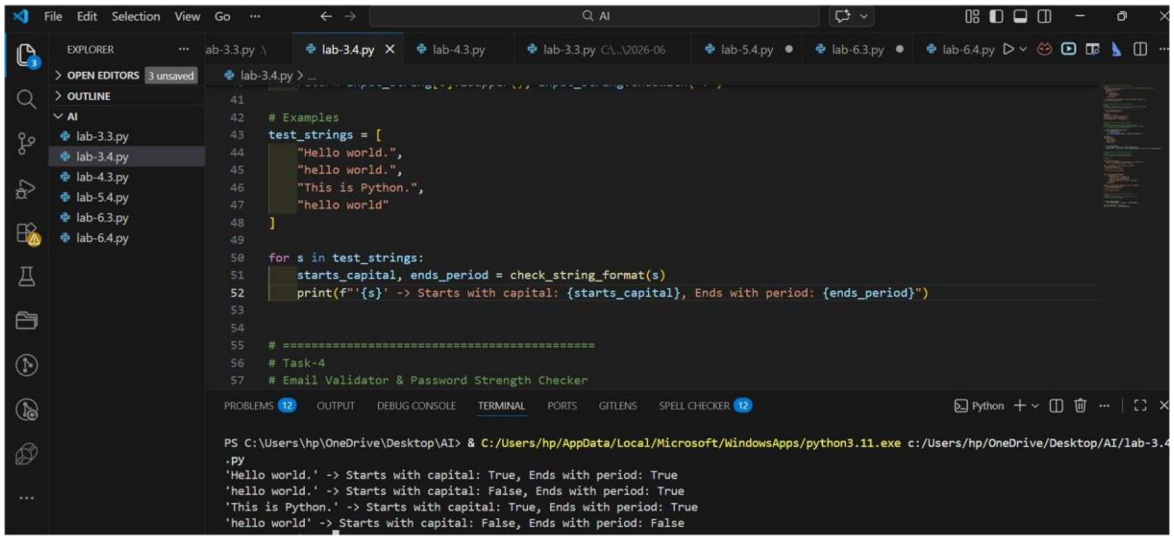
Task-3

Prompt : generate a Python program with 2-3 examples of how to check if a string starts with a capital letter and ends with a period using a function.

Code :

```
def check_string_format(input_string):
    starts_with_capital = input_string[0].isupper() if input_string else False
ends_with_period = input_string.endswith('.') if input_string else False
return starts_with_capital, ends_with_period
# Example usage
test_strings = [
    "Hello world.",
    "hello world.",
    "Hello world",
    "This is a test."
] for s in test_strings:
    starts_capital, ends_period = check_string_format(s)      print(f"String:
'{s}' | Starts with capital: {starts_capital} | Ends with period: {ends_period}")
```

Output :


```python
# Examples
test_strings = [
    "Hello world.",
    "hello world.",
    "This is Python.",
    "hello world"
]

for s in test_strings:
    starts_capital, ends_period = check_string_format(s)
    print(f"'{s}' -> Starts with capital: {starts_capital}, Ends with period: {ends_period}")


# ============================================
# Task-4
# Email Validator & Password Strength Checker
```

```
PS C:\Users\hp\OneDrive\Desktop\AI> & C:/Users/hp/AppData/Local/Microsoft/WindowsApps/python3.11.exe c:/Users/hp/OneDrive/Desktop/AI/lab-3.4
.py
'Hello world.' -> Starts with capital: True, Ends with period: True
'hello world.' -> Starts with capital: False, Ends with period: True
'This is Python.' -> Starts with capital: True, Ends with period: True
'hello world' -> Starts with capital: False, Ends with period: False
```

Code Analysis :

- ☐ The function checks both starting and ending conditions of a string.
- ☐ isupper() verifies whether the first character is capitalized.
- ☐ endswith('.') confirms proper sentence termination.
- ☐ Handles empty strings safely using conditional checks.
- ☐ Returns multiple Boolean values for detailed validation.

Task-4

Prompt: generate a code for Email

Validator Code: import re def

is_valid_email(email):

# Define a regex pattern for validating an Email pattern = r'^[a-zA-Z0-

9._%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,}$' return re.match(pattern, email)

is not None if __name__ == "__main__":

email = input("Enter an email address to validate: ") if

is_valid_email(email):

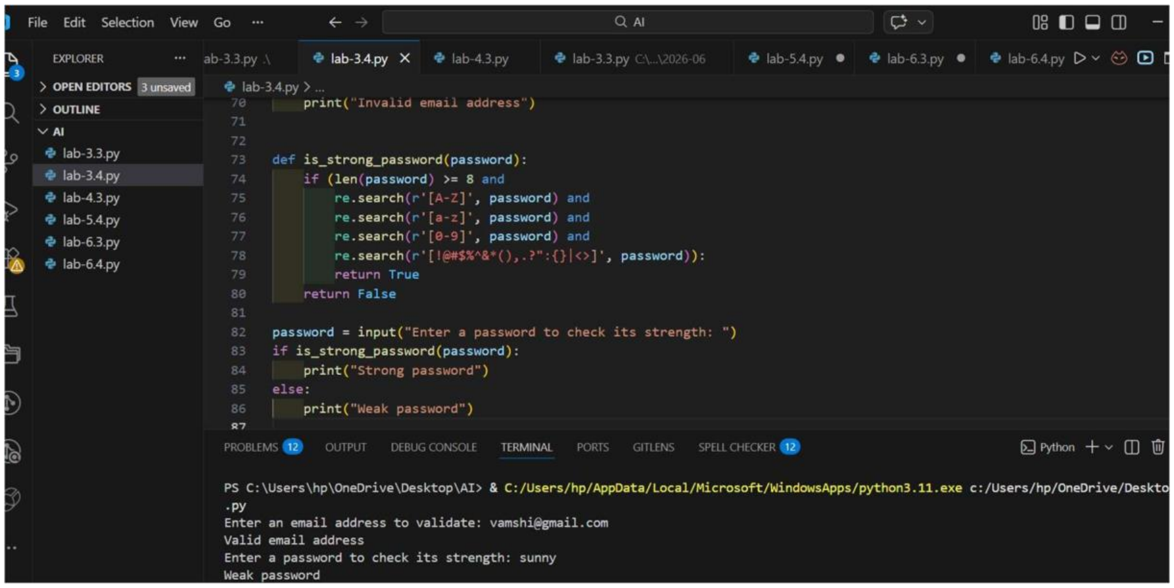
print(f"The email address '{email}' is valid.") else:

print(f"The email address '{email}' is not valid.")

# Password Strength Checker def is_strong_password(password):

```
   # A strong password has at least 8 characters, contains uppercase, lowercase, digit, and
special character     if (len(password) >= 8 and         re.search(r'[A-Z]', password) and
re.search(r'[a-z]', password) and         re.search(r'[0-9]', password) and
re.search(r'[!@#$%^&*(),.?":{}|<>]', password)):
        return True     return
False     if     __name__     ==
"__main__":      password = input("EnteQr a password to
check its strength: ")     if is_strong_password(password):
print("The password is strong.")      else:
        print("The password is weak.")
```

Output :



```
    print("Invalid email address")


def is_strong_password(password):
    if (len(password) >= 8 and
        re.search(r'[A-Z]', password) and
        re.search(r'[a-z]', password) and
        re.search(r'[0-9]', password) and
        re.search(r'[!@#$%^&*(),.?":{}|<>]', password)):
        return True
    return False

password = input("Enter a password to check its strength: ")
if is_strong_password(password):
    print("Strong password")
else:
    print("Weak password")
```

```
PS C:\Users\hp\OneDrive\Desktop\AI> & C:/Users/hp/AppData/Local/Microsoft/WindowsApps/python3.11.exe c:/Users/hp/OneDrive/Deskto
.py
Enter an email address to validate: vamshi@gmail.com
Valid email address
Enter a password to check its strength: sunny
Weak password
```

Code Analysis :

- □ Regular expressions (re) are used for pattern matching.
- □ Email validation ensures correct structure using a defined regex.
- □ Password checker verifies length, case, digits, and special characters.
- □ Separate functions improve modularity and readability.
- □ Enhances security by validating user credentials effectively.

Task 5

Prompt: generate a Python program with a function that returns the sum of the digits of a number

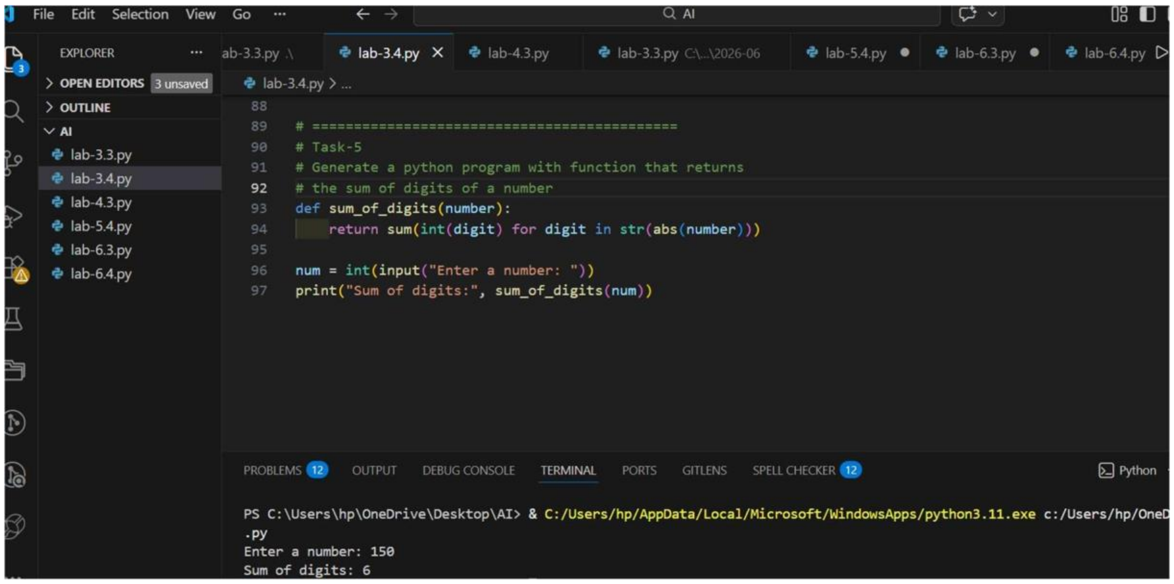
Code:

def sum_of_digits(number):

    return sum(int(digit) for digit in str(abs(number)))

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

Output :



```
# ============================================
# Task-5
# Generate a python program with function that returns
# the sum of digits of a number
def sum_of_digits(number):
    return sum(int(digit) for digit in str(abs(number)))

num = int(input("Enter a number: "))
print("Sum of digits:", sum_of_digits(num))
```

```
PS C:\Users\hp\OneDrive\Desktop\AI> & C:/Users/hp/AppData/Local/Microsoft/WindowsApps/python3.11.exe c:/Users/hp/OneD
.py
Enter a number: 150
Sum of digits: 6
```

Code Analysis :

- □ The function converts the number into a string for easy digit access.
- □ abs() ensures correct handling of negative numbers.
- □ int() converts each character back to a digit.
- □ sum() efficiently adds all digits in one line.
- □ Function returns the result, supporting reuse in other programs.