ASSIGNMENT - 3.4

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Batch-10

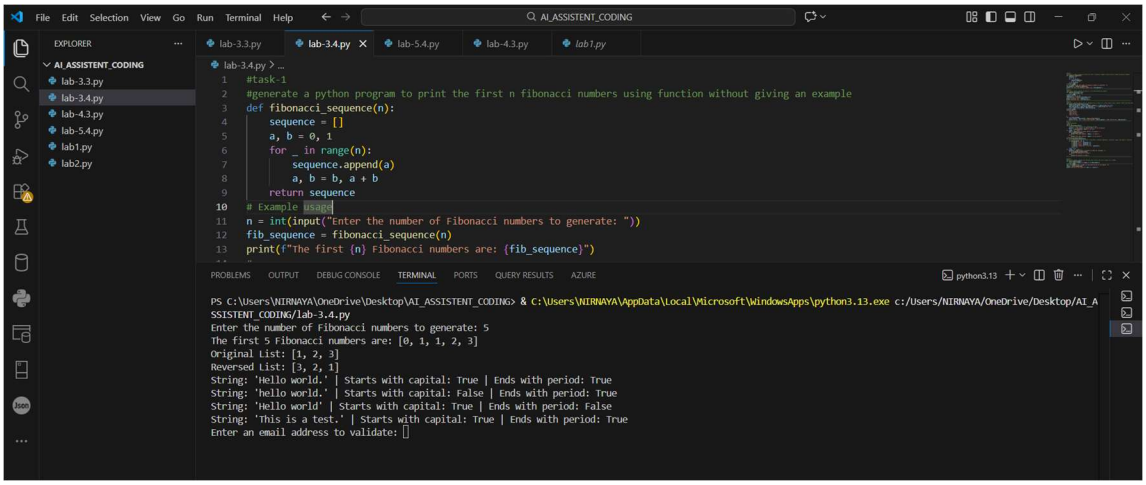
Task-1

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 :



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.

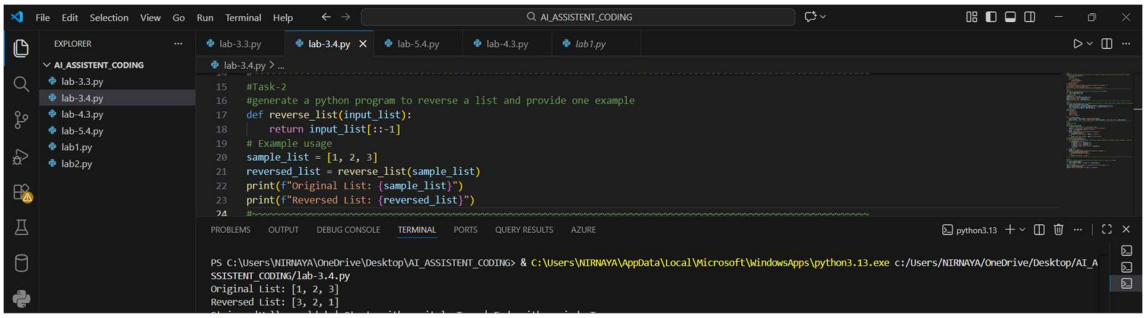
Task-2

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 :



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

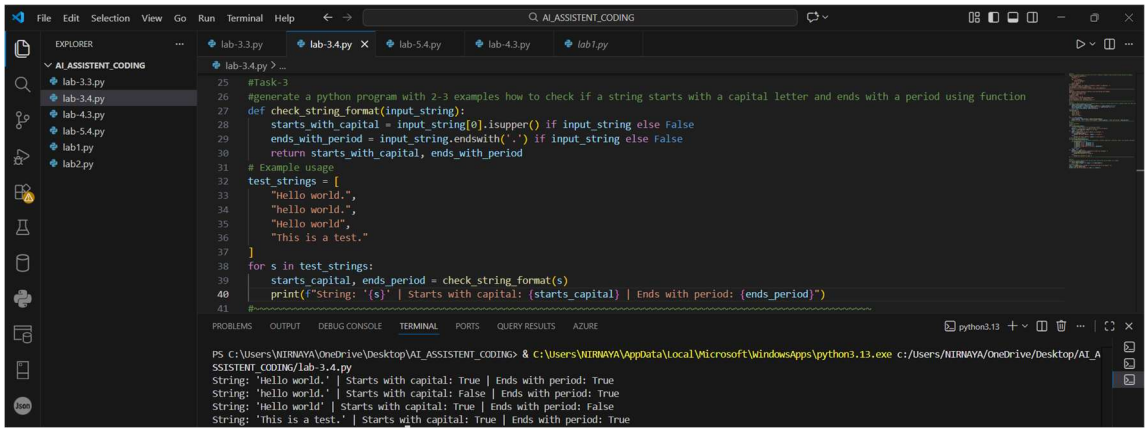
Prompt : generate a Python program with 2-3 examples of how to check if a string starts with a capital letter and ends with a period using a function.

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 :



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: Email Validator

Code:

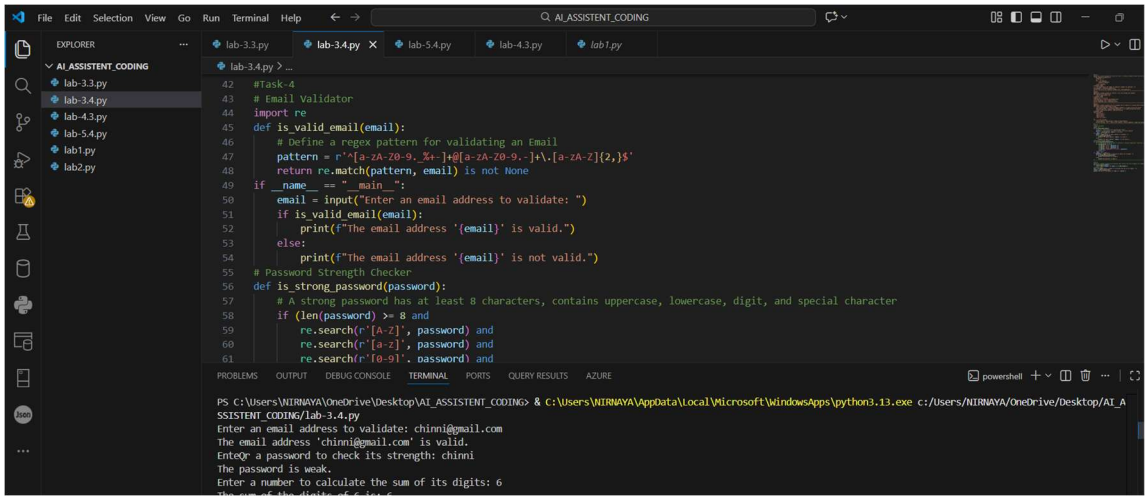
```
import re

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 :



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.

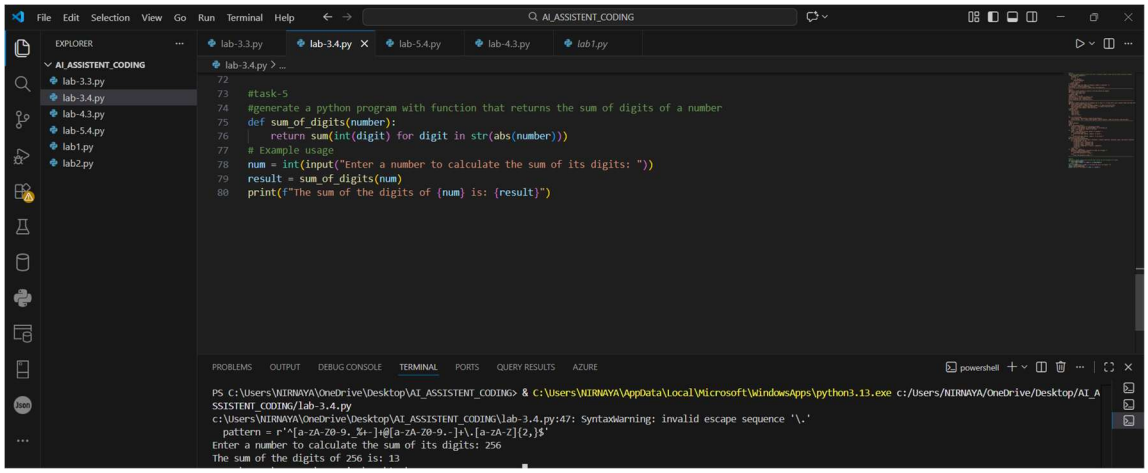
Task 5

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 :



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.