ASSIGNMENT-1.3

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BATCH-10

➢ TASK-1:

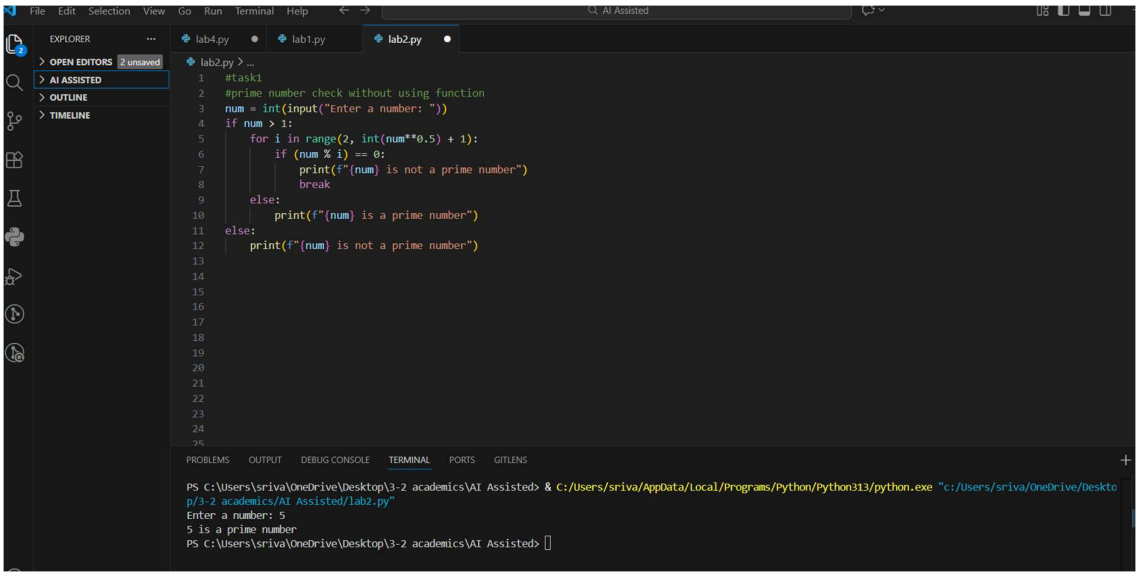
PROMPT:

Prime number check without using function.

CODE:

```
num = int(input("Enter a number: "))
if num > 1:
   for i in range(2, int(num**0.5) + 1):
      if (num % i) == 0:
         print(f"{num} is not a prime number")
         break
   else:
      print(f"{num} is a prime number")
else:
   print(f"{num} is not a prime number")
```

OUTPUT:



EXPLANATION:

- This program checks whether a number is prime by testing if it has any divisors from 2 to √n.
- If it is divisible by any number, it is not prime.
- If no divisor is found, it is prime.
- Numbers less than or equal to 1 are not prime..

❖ TASK-2

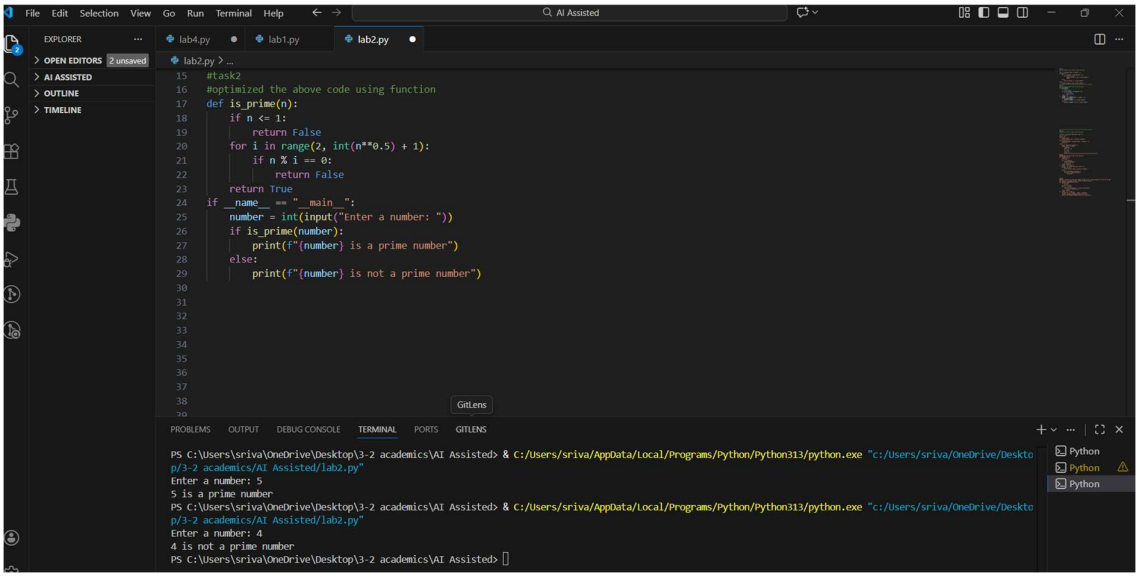
PROMPT:

optimized the above code using function.

CODE:

```
def is_prime(n):
    if n <= 1:
        return False
    for i in range(2, int(n**0.5) + 1):
        if n % i == 0:
            return False
    return True
if __name__ == "__main__":
    number = int(input("Enter a number: "))
    if is_prime(number):
        print(f"{number} is a prime number")
    else:
        print(f"{number} is not a prime number")
```

OUTPUT:



EXPLANATION:

- This program defines a function is_prime() that checks whether a number is prime by trying to divide it by all numbers from 2 up to the square root of the number.
- If any division gives remainder 0, the function returns False (not prime). If no divisor is found, it returns True (prime).
- The main part of the program takes a number from the user, calls the function, and prints whether the number is prime or not.

❖ TASK-3:

PROMPT:

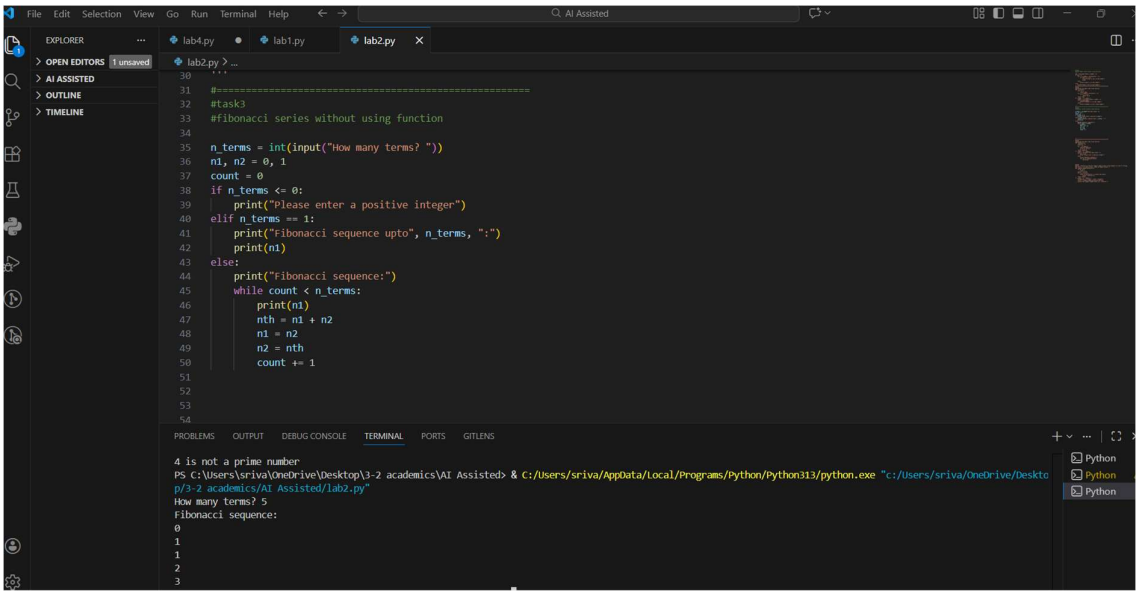
Fibonacci series without using function.

CODE:

```
n_terms = int(input("How many terms? "))

n1, n2 = 0, 1

count = 0

if n_terms <= 0:

   print("Please enter a positive integer")

elif n_terms == 1:
```

```
    print("Fibonacci sequence upto", n_terms, ":")
    print(n1)
else:
    print("Fibonacci sequence:")
    while count < n_terms:
        print(n1)
        nth = n1 + n2
        n1 = n2
        n2 = nth
        count += 1
```

OUTPUT:



EXPLANATION:

- This program prints the Fibonacci sequence up to the number of terms entered by the user.
  It starts with 0 and 1, then each next number is formed by adding the previous two numbers.
- If the user enters 0 or a negative number, it shows an error message.
  If the user enters 1, it prints only the first term (0).
  Otherwise, it uses a loop to generate and print the required Fibonacci numbers.

❖ TASK-4:

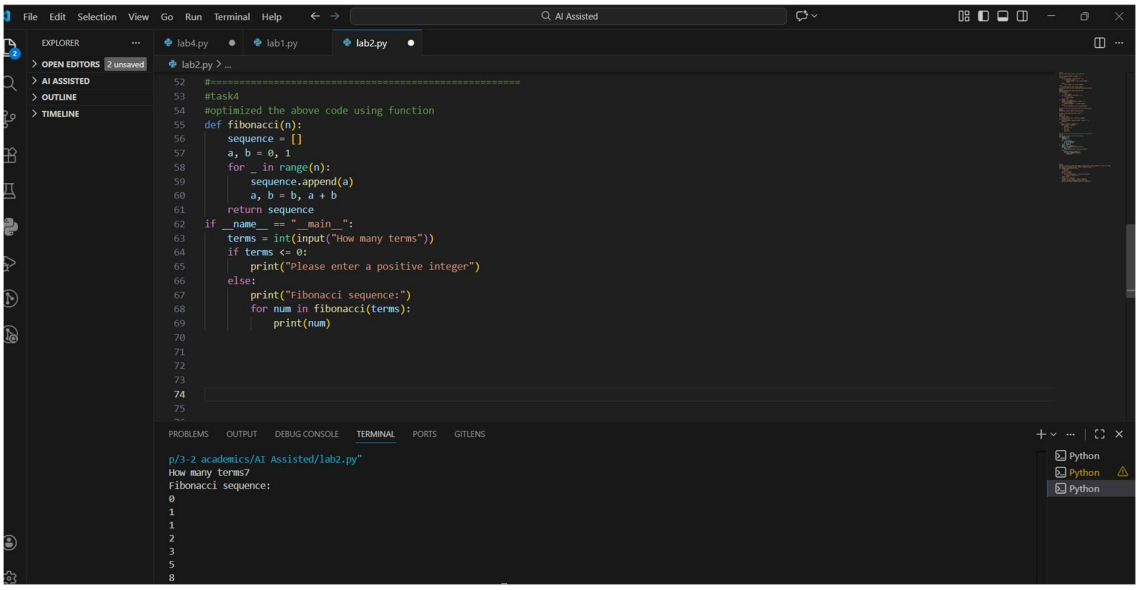
PROMPT:

optimized the above code using function.

CODE:

```
def fibonacci(n):
    sequence = []
    a, b = 0, 1
    for _ in range(n):
        sequence.append(a)
        a, b = b, a + b
    return sequence
if __name__ == "__main__":
    terms = int(input("How many terms"))
    if terms <= 0:
        print("Please enter a positive integer")
    else:
        print("Fibonacci sequence:")
        for num in fibonacci(terms):
            print(num)
```

OUTPUT:



EXPLANATION:

- The function fibonacci(n) creates a list and fills it with Fibonacci numbers starting from 0 and 1. Each new number is formed by adding the previous two numbers. It returns the list of generated numbers.
- In the main part of the program, the user enters how many terms they want. If the number is 0 or negative, the program asks for a positive integer.
- Otherwise, it calls the fibonacci() function and prints the Fibonacci sequence.

❖ TASK-5:

PROMPT:

#Write a function to find the longest common prefix string amongst an array of strings.

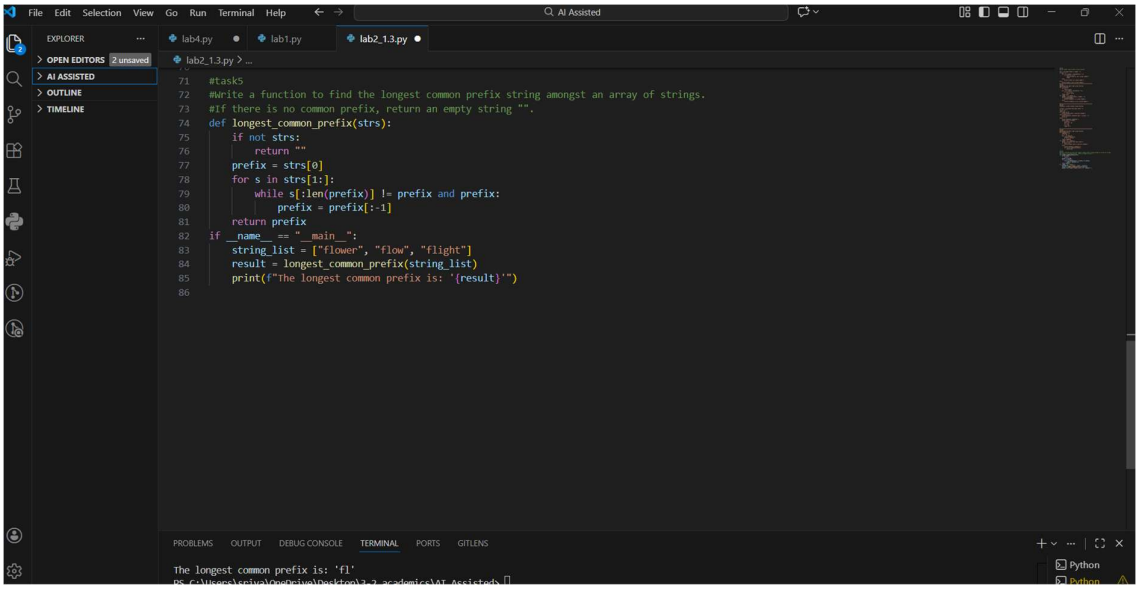
#If there is no common prefix, return an empty string "".

CODE:

```
def longest_common_prefix(strs):
  if not strs:
    return ""
```

```
    prefix = strs[0]
    for s in strs[1:]:
        while s[:len(prefix)] != prefix and prefix:
            prefix = prefix[:-1]
    return prefix
if __name__ == "__main__":
    string_list = ["flower", "flow", "flight"]
    result = longest_common_prefix(string_list)
    print(f"The longest common prefix is: '{result}'")
```

OUTPUT:



EXPLANATION:

- This program finds the longest common prefix (starting part) shared by all strings in a list.
- It begins by assuming the first string is the prefix. Then it compares this prefix with each remaining string. If the current prefix does not match the beginning of a string, it shortens the prefix by removing the last character and checks again.
- This continues until a match is found or the prefix becomes empty.
- After checking all strings, the remaining prefix is the longest common prefix, and it is printed as the result.