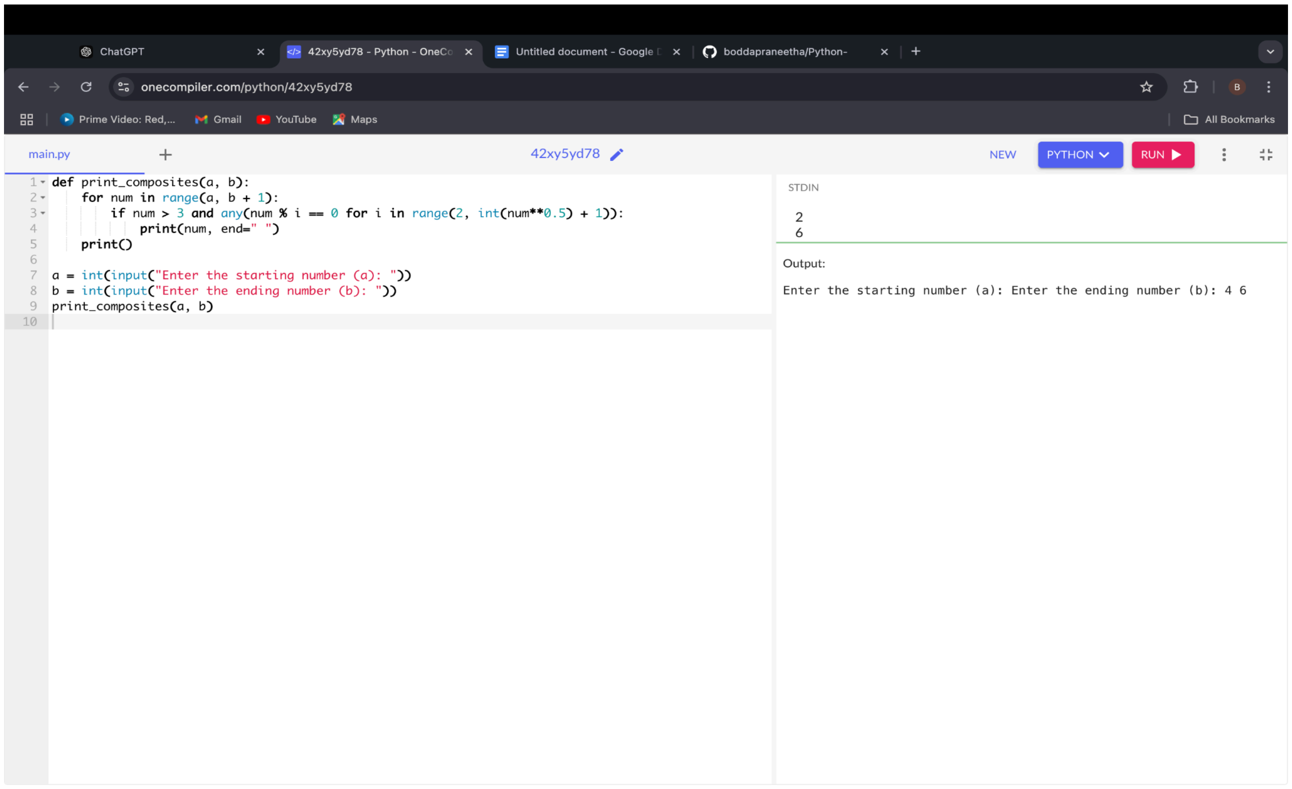
41. Write a program to print all the composite numbers between a and b?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main.py
42xy5yd78
NEW
PYTHON
RUN
STDIN
Output:

```python
def print_composites(a, b):
    for num in range(a, b + 1):
        if num > 3 and any(num % i == 0 for i in range(2, int(num**0.5) + 1)):
            print(num, end=" ")
    print()

a = int(input("Enter the starting number (a): "))
b = int(input("Enter the ending number (b): "))
print_composites(a, b)
```

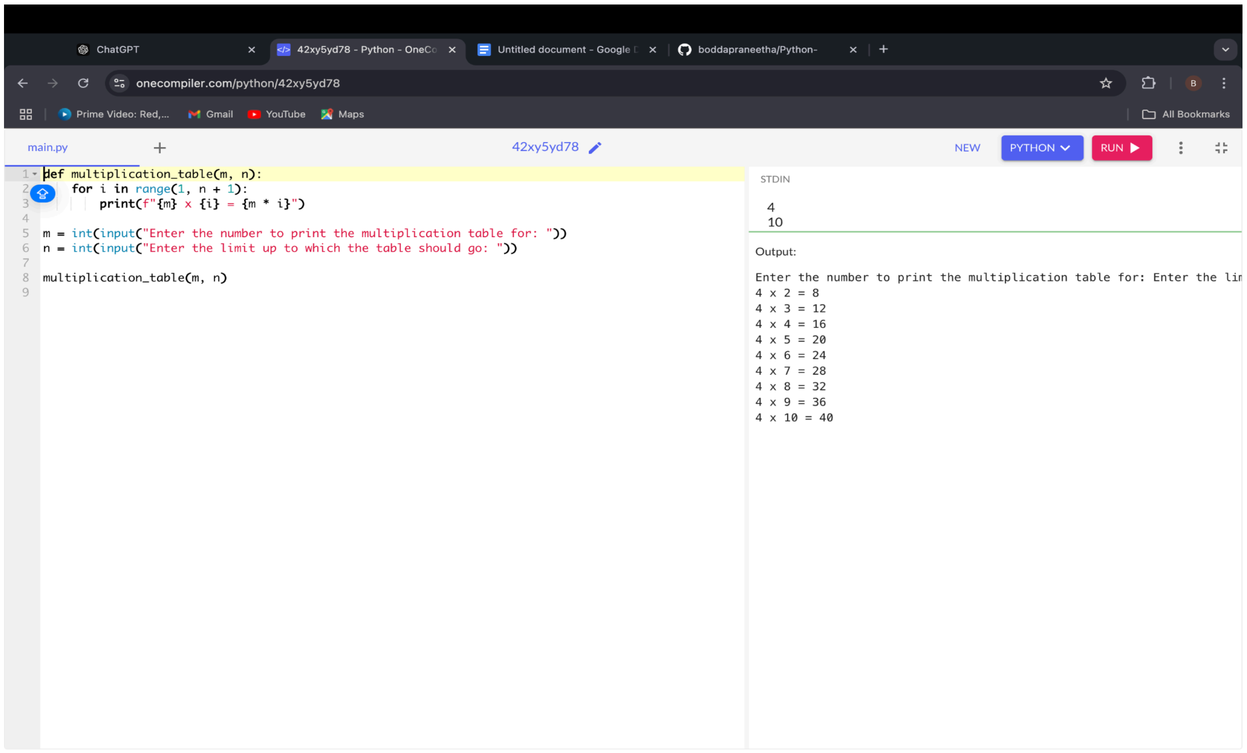
STDIN

```
2
6
```

Output:

```
Enter the starting number (a): Enter the ending number (b): 4 6
```

42. Write a program to print the multiplication table of number m up to n.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main.py
42xy5yd78
NEW
PYTHON
RUN
STDIN
Output:

```python
def multiplication_table(m, n):
    for i in range(1, n + 1):
        print(f"{m} x {i} = {m * i}")

m = int(input("Enter the number to print the multiplication table for: "))
n = int(input("Enter the limit up to which the table should go: "))

multiplication_table(m, n)
```

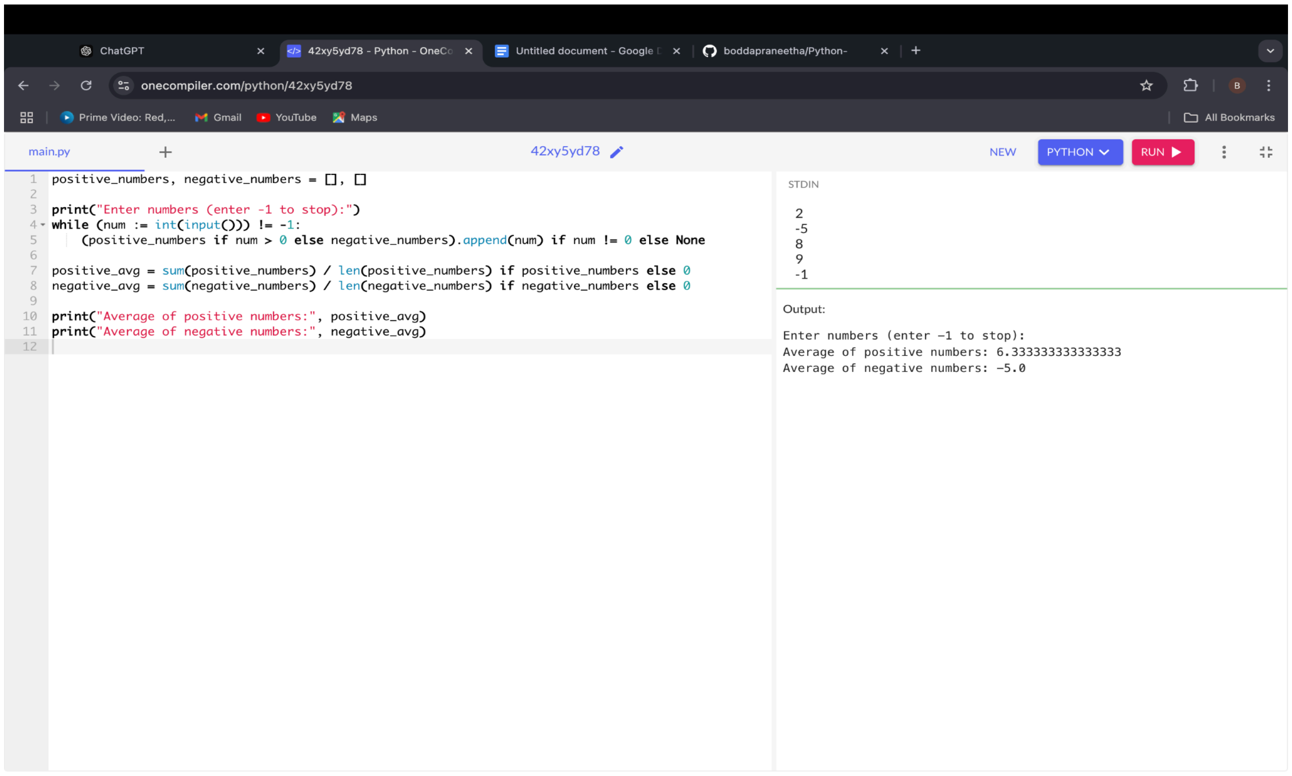
STDIN

```
4
10
```

Output:

```
Enter the number to print the multiplication table for: Enter the lir
4 x 2 = 8
4 x 3 = 12
4 x 4 = 16
4 x 5 = 20
4 x 6 = 24
4 x 7 = 28
4 x 8 = 32
4 x 9 = 36
4 x 10 = 40
```

43. Write a program to read the numbers until -1 is encountered. Find the average of positive numbers and negative numbers entered by user



```python
positive_numbers, negative_numbers = [], []

print("Enter numbers (enter -1 to stop):")
while (num := int(input())) != -1:
    (positive_numbers if num > 0 else negative_numbers).append(num) if num != 0 else None

positive_avg = sum(positive_numbers) / len(positive_numbers) if positive_numbers else 0
negative_avg = sum(negative_numbers) / len(negative_numbers) if negative_numbers else 0

print("Average of positive numbers:", positive_avg)
print("Average of negative numbers:", negative_avg)
```

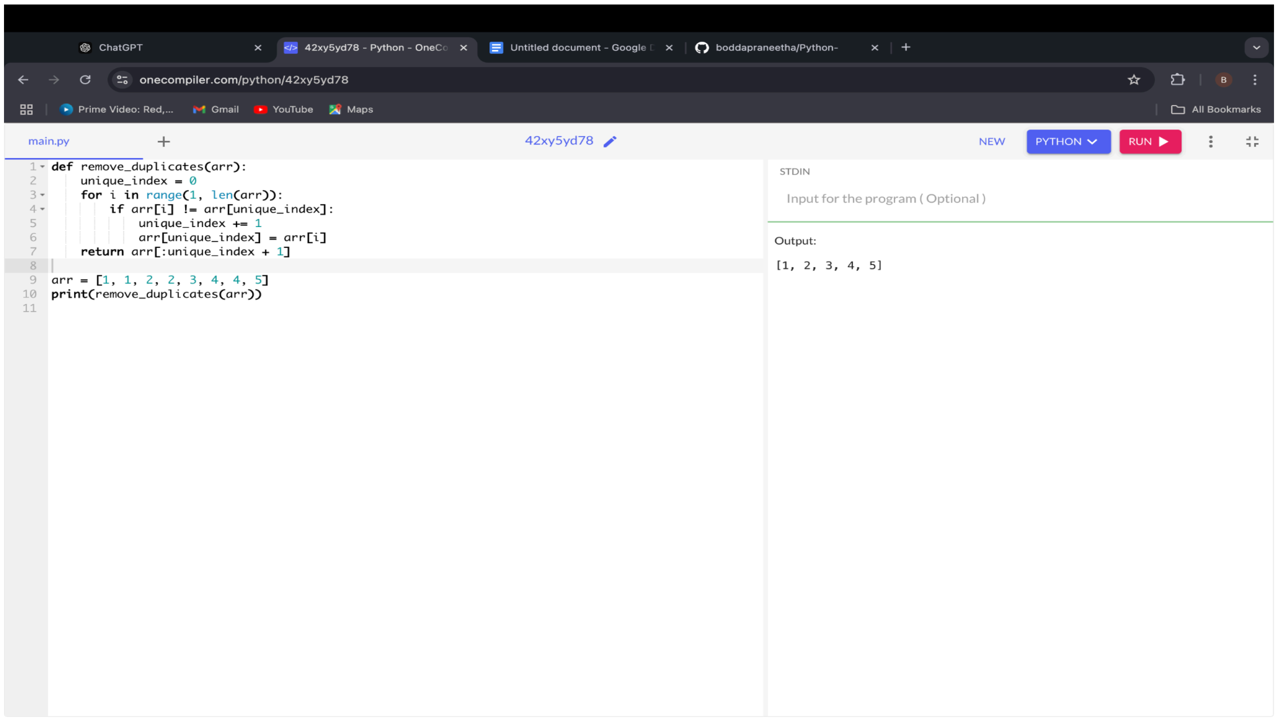
STDIN

```
2
-5
8
9
-1
```

Output:

```
Enter numbers (enter -1 to stop):
Average of positive numbers: 6.333333333333333
Average of negative numbers: -5.0
```

44. Program to remove duplicates from the sorted array



```python
def remove_duplicates(arr):
    unique_index = 0
    for i in range(1, len(arr)):
        if arr[i] != arr[unique_index]:
            unique_index += 1
            arr[unique_index] = arr[i]
    return arr[:unique_index + 1]

arr = [1, 1, 2, 2, 3, 4, 4, 5]
print(remove_duplicates(arr))
```

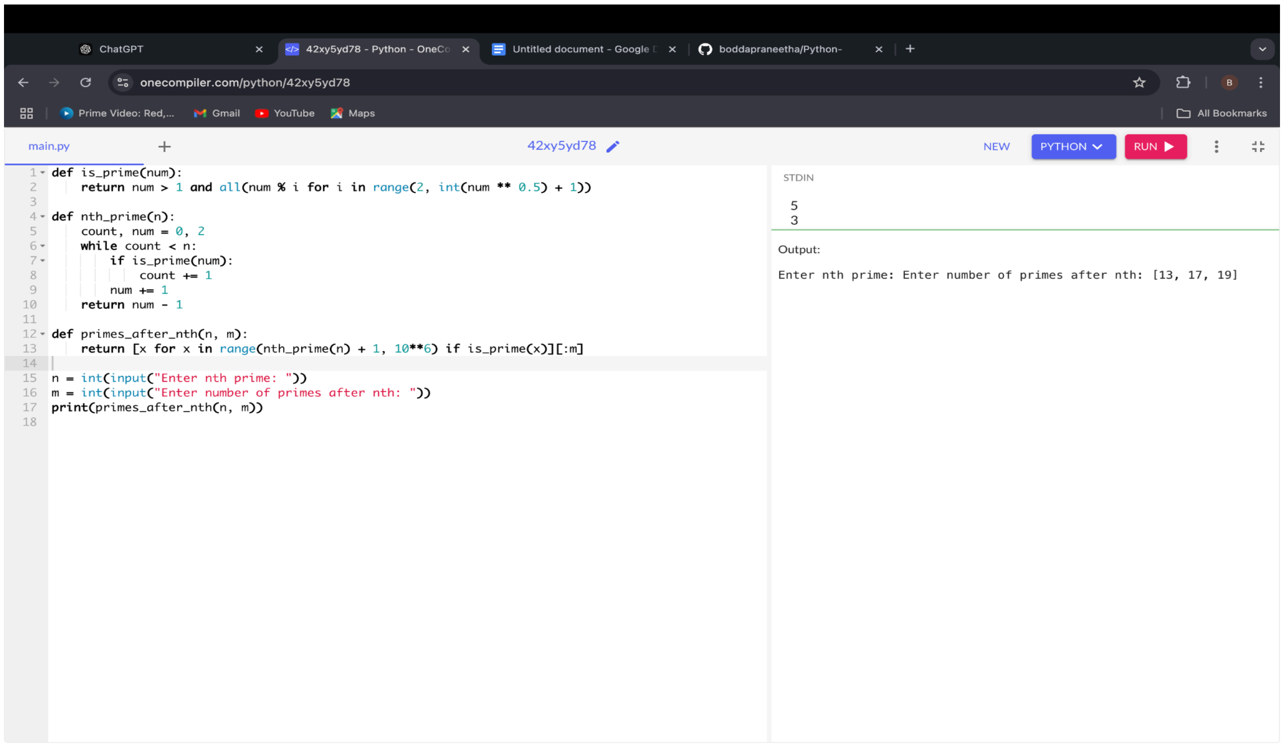
STDIN

Input for the program (Optional)

Output:

```
[1, 2, 3, 4, 5]
```

45. Write a program to print n prime numbers after n th Prime number

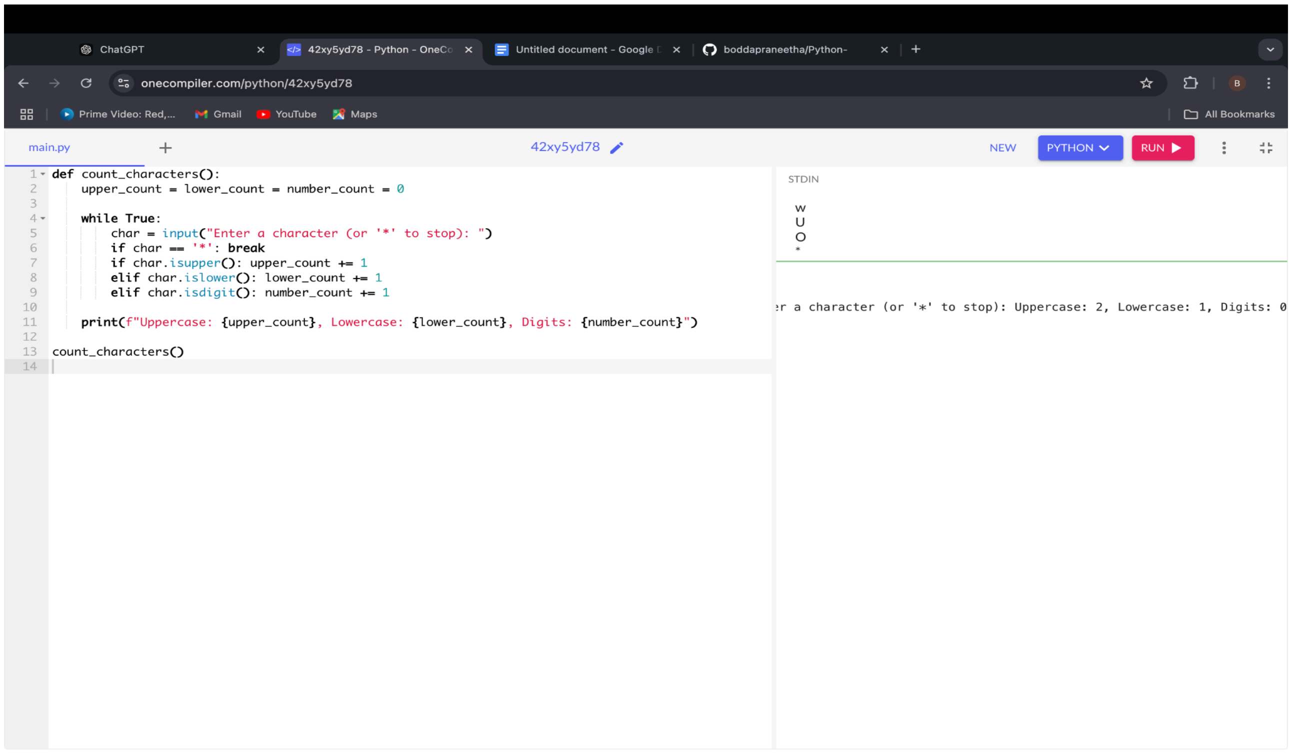


```python
def is_prime(num):
    return num > 1 and all(num % i for i in range(2, int(num ** 0.5) + 1))

def nth_prime(n):
    count, num = 0, 2
    while count < n:
        if is_prime(num):
            count += 1
        num += 1
    return num - 1

def primes_after_nth(n, m):
    return [x for x in range(nth_prime(n) + 1, 10**6) if is_prime(x)][:m]

n = int(input("Enter nth prime: "))
m = int(input("Enter number of primes after nth: "))
print(primes_after_nth(n, m))
```

```
5
3
```

```
Enter nth prime: Enter number of primes after nth: [13, 17, 19]
```

46. write a program to read a character until a * is encountered. Also count the number of uppercase, lowercase, and numbers entered by the users.

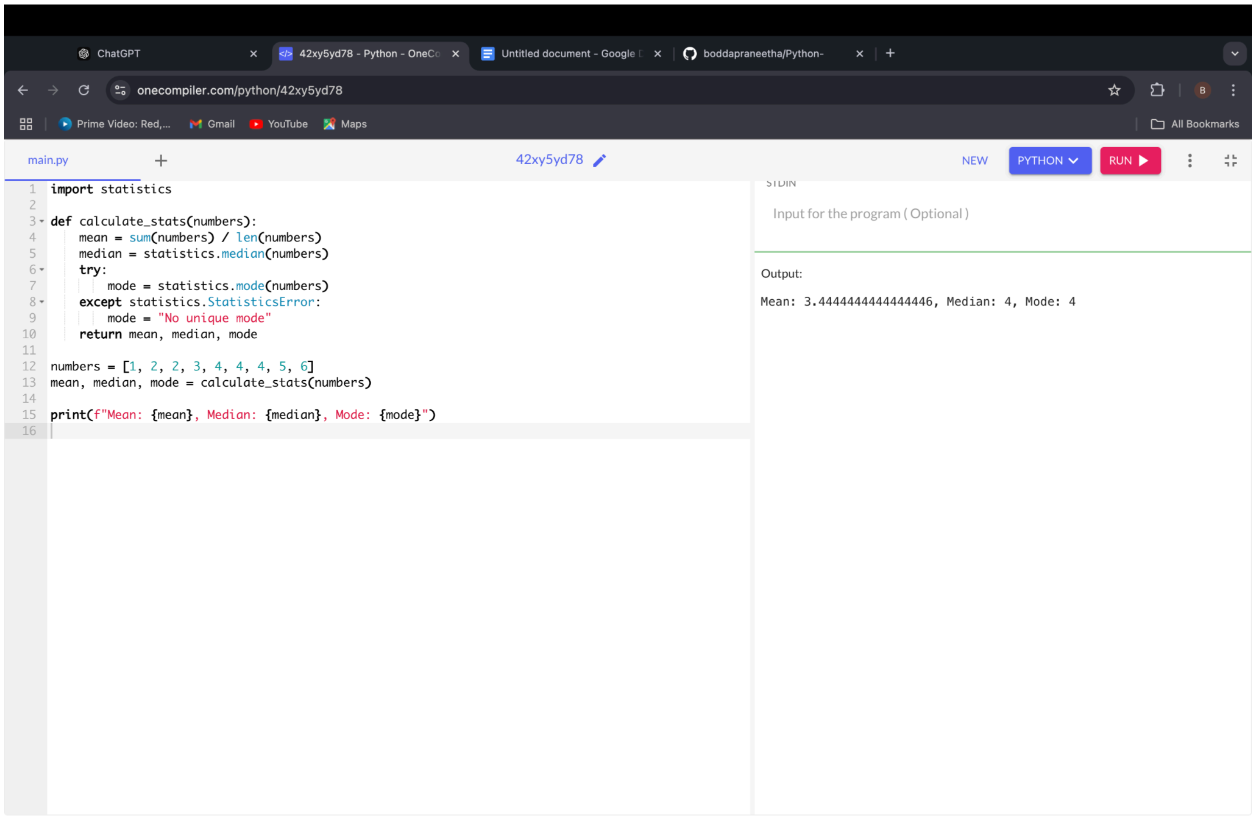


```python
def count_characters():
    upper_count = lower_count = number_count = 0

    while True:
        char = input("Enter a character (or '*' to stop): ")
        if char == '*': break
        if char.isupper(): upper_count += 1
        elif char.islower(): lower_count += 1
        elif char.isdigit(): number_count += 1

    print(f"Uppercase: {upper_count}, Lowercase: {lower_count}, Digits: {number_count}")

count_characters()
```

```
w
U
O
*
```

```
er a character (or '*' to stop): Uppercase: 2, Lowercase: 1, Digits: 0
```

47. write a program to Find the Mean, Median, Mode of the array of numbers?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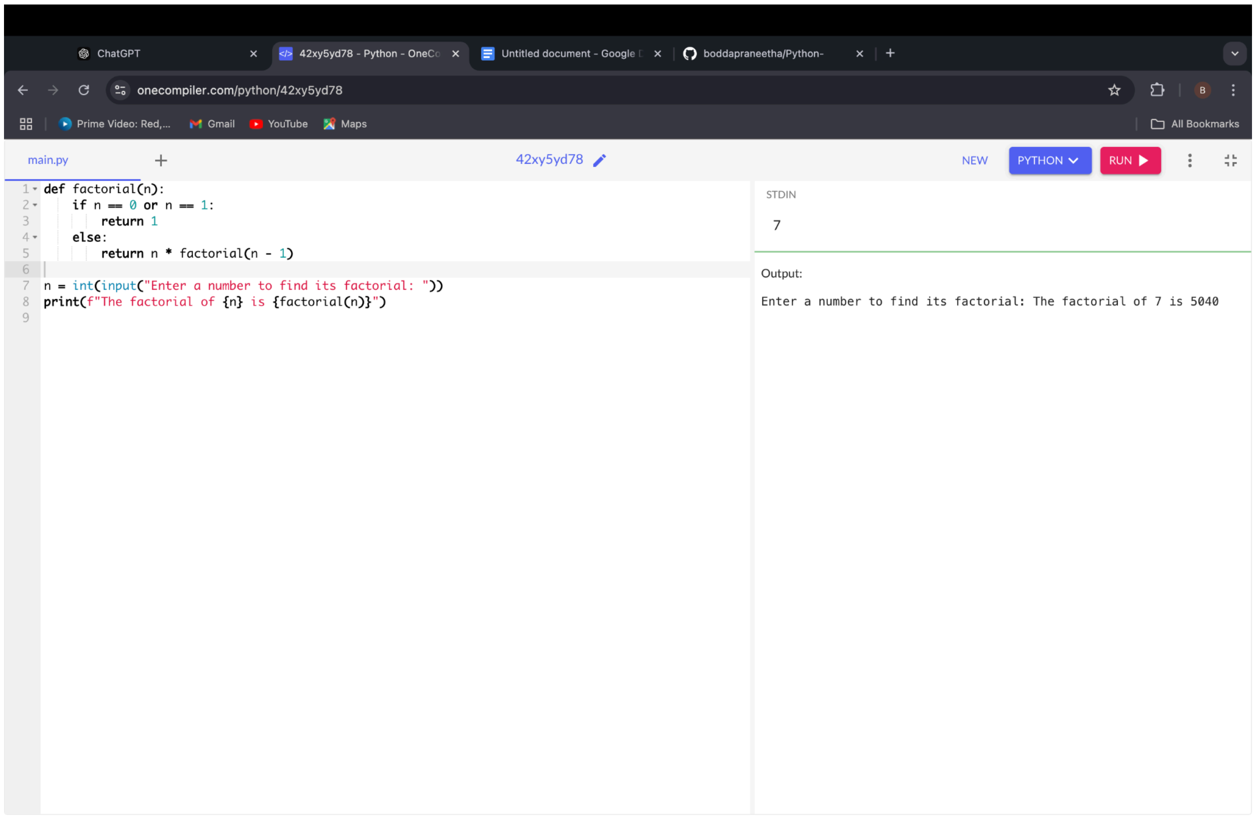
main.py
42xy5yd78
NEW
PYTHON
RUN
STDIN
Input for the program (Optional)
Output:

```python
import statistics

def calculate_stats(numbers):
    mean = sum(numbers) / len(numbers)
    median = statistics.median(numbers)
    try:
        mode = statistics.mode(numbers)
    except statistics.StatisticsError:
        mode = "No unique mode"
    return mean, median, mode

numbers = [1, 2, 2, 3, 4, 4, 4, 5, 6]
mean, median, mode = calculate_stats(numbers)

print(f"Mean: {mean}, Median: {median}, Mode: {mode}")
```

```
Mean: 3.4444444444444446, Median: 4, Mode: 4
```

48. write a program to Find the factorial of n?

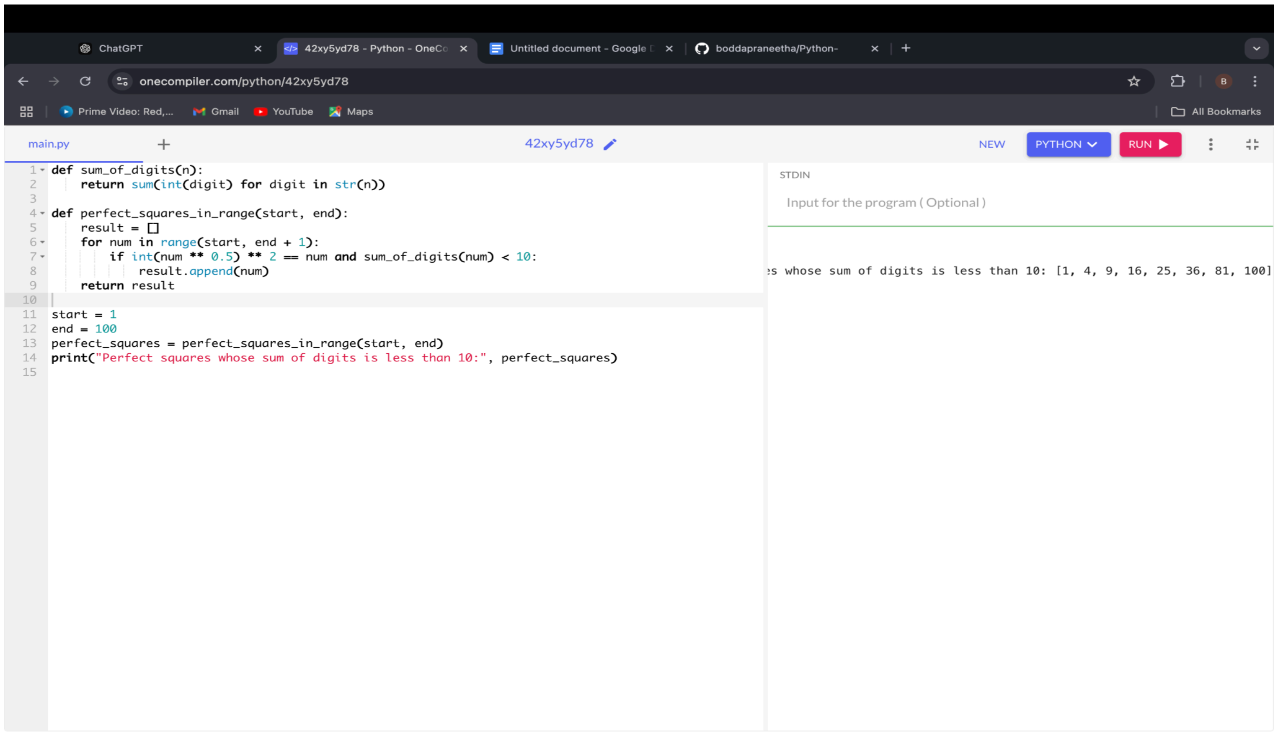


```python
def factorial(n):
    if n == 0 or n == 1:
        return 1
    else:
        return n * factorial(n - 1)

n = int(input("Enter a number to find its factorial: "))
print(f"The factorial of {n} is {factorial(n)}")
```

```
7
```

```
Enter a number to find its factorial: The factorial of 7 is 5040
```

49. Write a Python Program to create a list of all numbers in a range which are perfect squares and the sum of the digits of the number is less than 10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main.py
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NEW
PYTHON
RUN
STDIN
Input for the program (Optional)

```python
def sum_of_digits(n):
    return sum(int(digit) for digit in str(n))

def perfect_squares_in_range(start, end):
    result = []
    for num in range(start, end + 1):
        if int(num ** 0.5) ** 2 == num and sum_of_digits(num) < 10:
            result.append(num)
    return result

start = 1
end = 100
perfect_squares = perfect_squares_in_range(start, end)
print("Perfect squares whose sum of digits is less than 10:", perfect_squares)
```

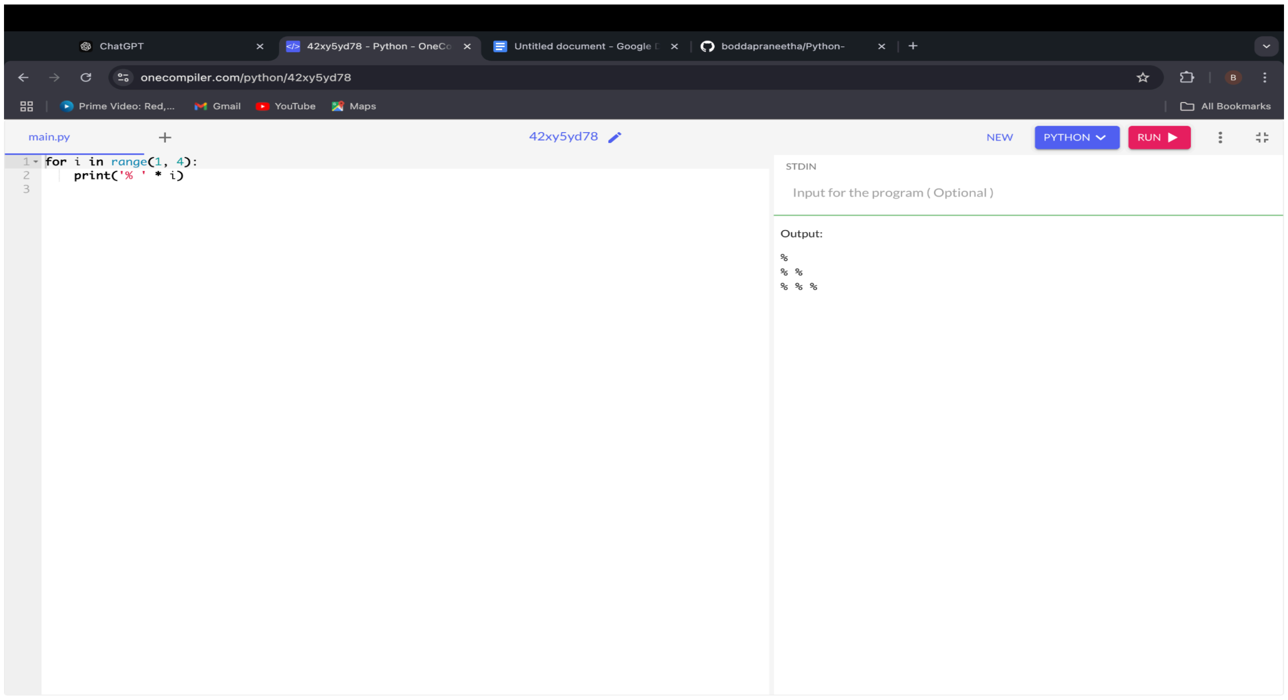
```
s whose sum of digits is less than 10: [1, 4, 9, 16, 25, 36, 81, 100]
```

50. Write a program to print the following pattern

%

% %

% % %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NEW
PYTHON
RUN
STDIN
Input for the program (Optional)

```python
for i in range(1, 4):
    print('% ' * i)
```

Output:

```
%
% %
% % %
```