ASSIGNMENT-3.1

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B-13

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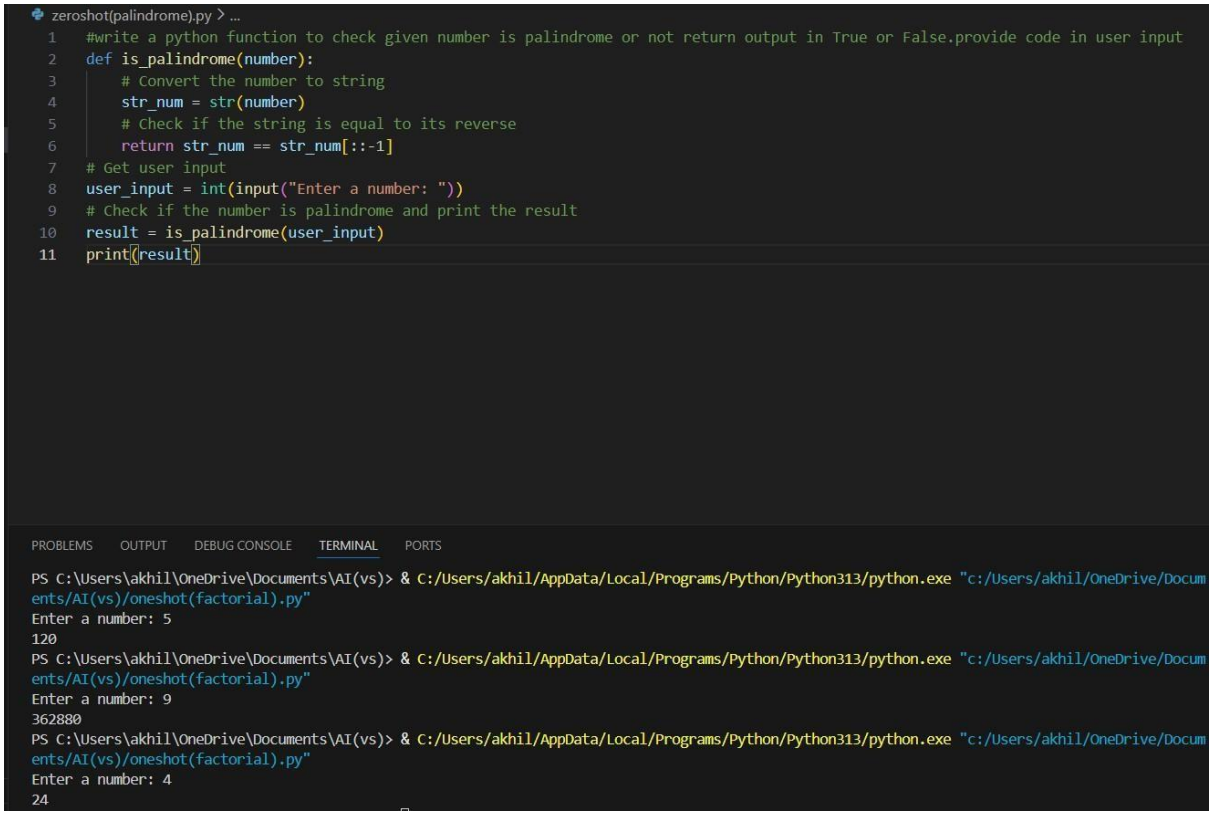
Task 1: Zero-Shot Prompting (Palindrome Number Program)

Prompt: write a python function to check given number is palindrome or not return output int Tr ue or False. Provide code in user input.

Code with output:



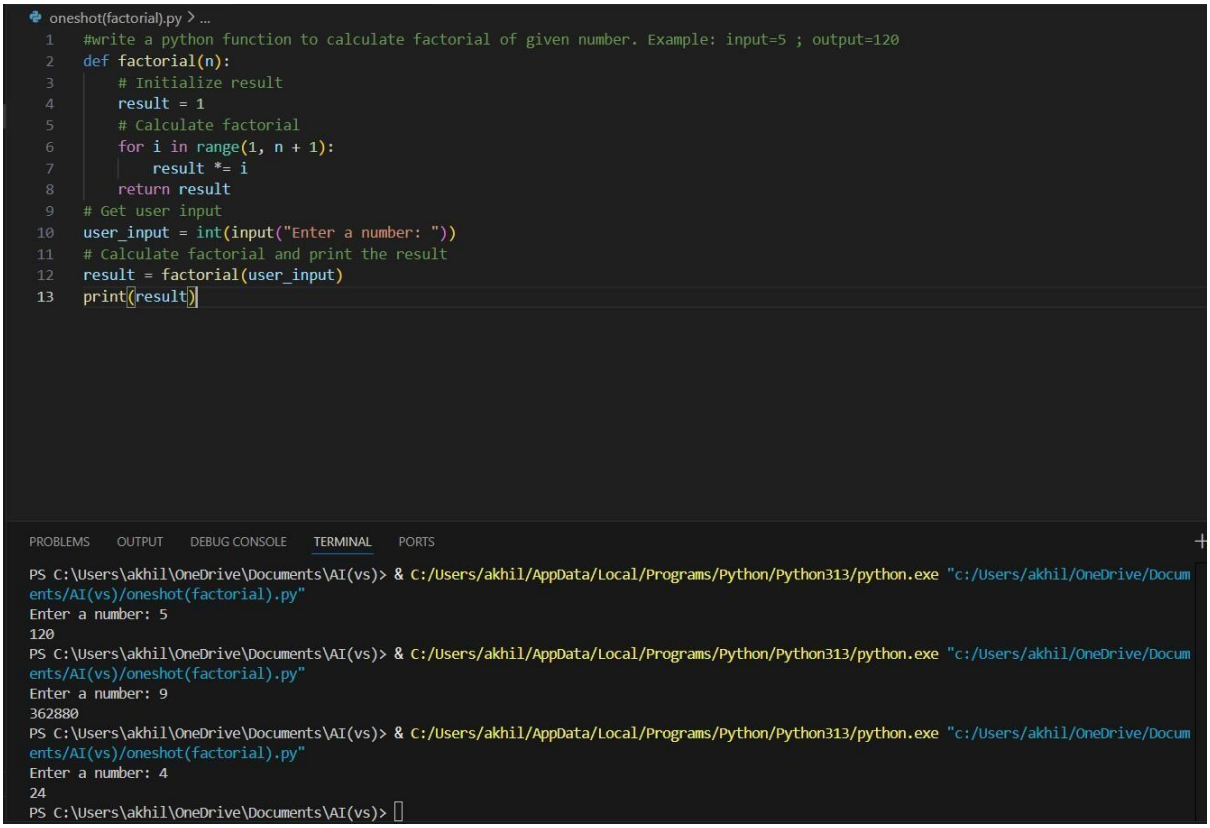
Justification:

- Correct for positive numbers
- Negative numbers not handled clearly
- No input validation for non-integers

Task 2: One-Shot Prompting (Factorial Calculation)

Prompt: write a python function to calculate factorial of given number. Example: input=5 ; output=120

Code with output:

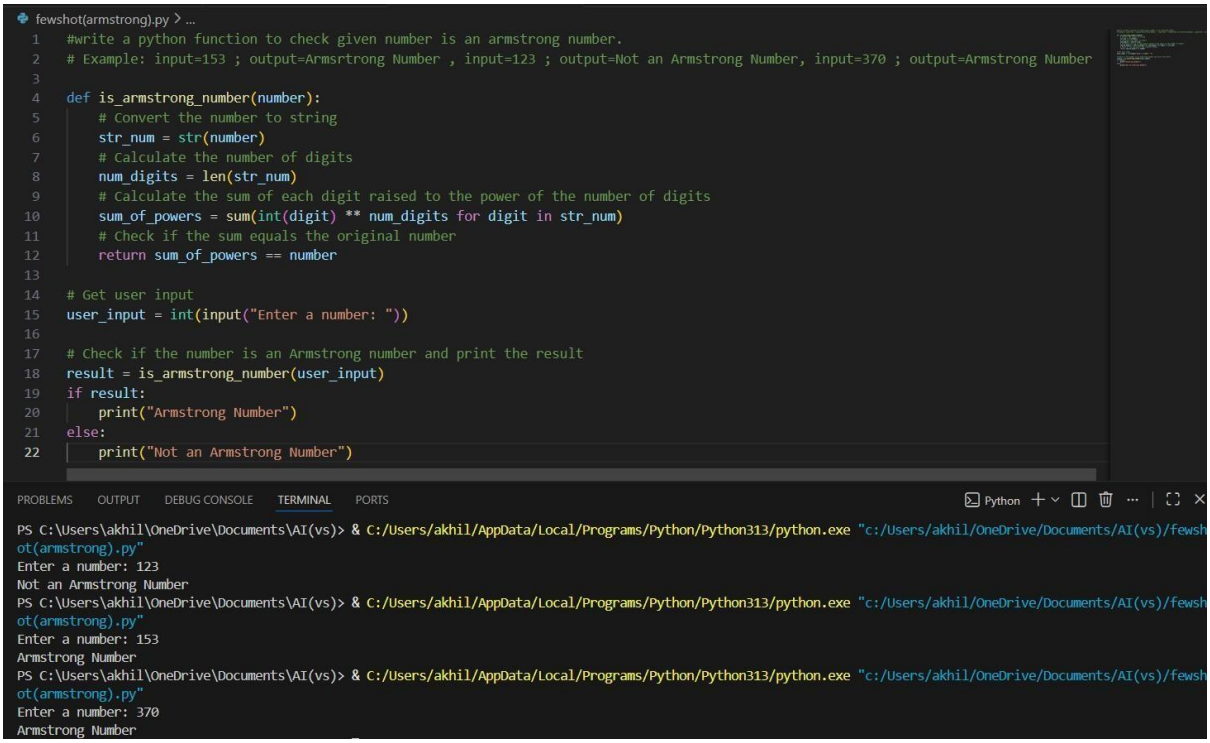


Justification:

- One-shot gives clearer logic
- More readable and reliable

Task 3: Few-Shot Prompting (Armstrong Number Check)

Code with output:



Justification:

- Few-shot improves accuracy
- Code structure matches examples
- Still lacks input validation for negatives

Task 4: Context-Managed Prompting (Optimized Number Classification)

Prompt: generate an optimized python program that classifies a number is prime, composite or neither Code with output:

```python
#generate an optimized Python program that classifies a number is prime , composite or neither.
def classify_number(number):
    if number <= 1:
        return "Neither Prime nor Composite"
    elif number == 2:
        return "Prime"
    elif number % 2 == 0:
        return "Composite"
    else:
        for i in range(3, int(number**0.5) + 1, 2):
            if number % i == 0:
                return "Composite"
        return "Prime"
# Get user input
user_input = int(input("Enter a number: "))
# Classify the number and print the result
result = classify_number(user_input)
print(result)
```

```
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Documents/AI(vs)/xtmanaged(optimizednumberclassification).py"
Enter a number: 5
Prime
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Documents/AI(vs)/xtmanaged(optimizednumberclassification).py"
Enter a number: 6
Composite
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Documents/AI(vs)/xtmanaged(optimizednumberclassification).py"
Enter a number: -5
Neither Prime nor Composite
```

Justification:

- Best performance among all prompts
- Clear validation and optimized logic
- Context improves efficiency and correctness

Task 5: Zero-Shot Prompting (Perfect Number Check)

Prompt:generate a python function to check given number is a perfect number.

Code with output:

```python
#generate a python function to check given number is a perfect number

def is_perfect_number(number):
    if number < 1:
        return False
    # Calculate the sum of divisors
    divisors_sum = sum(i for i in range(1, number) if number % i == 0)
    # A perfect number is equal to the sum of its proper divisors
    return divisors_sum == number
# Get user input
user_input = int(input("Enter a number: "))
# Check if the number is a perfect number and print the result
result = is_perfect_number(user_input)
print(result)
```

```
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Documents/AI(vs)/zshot(perfectnumber).py"
Enter a number: 22
False
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Documents/AI(vs)/zshot(perfectnumber).py"
Enter a number: 6
True
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Documents/AI(vs)/zshot(perfectnumber).py"
Enter a number: -3
False
```

Task 6: Few-Shot Prompting (Even or Odd Classification with

Validation)

Code with output: