AI Assisted Coding

Assignment - 3

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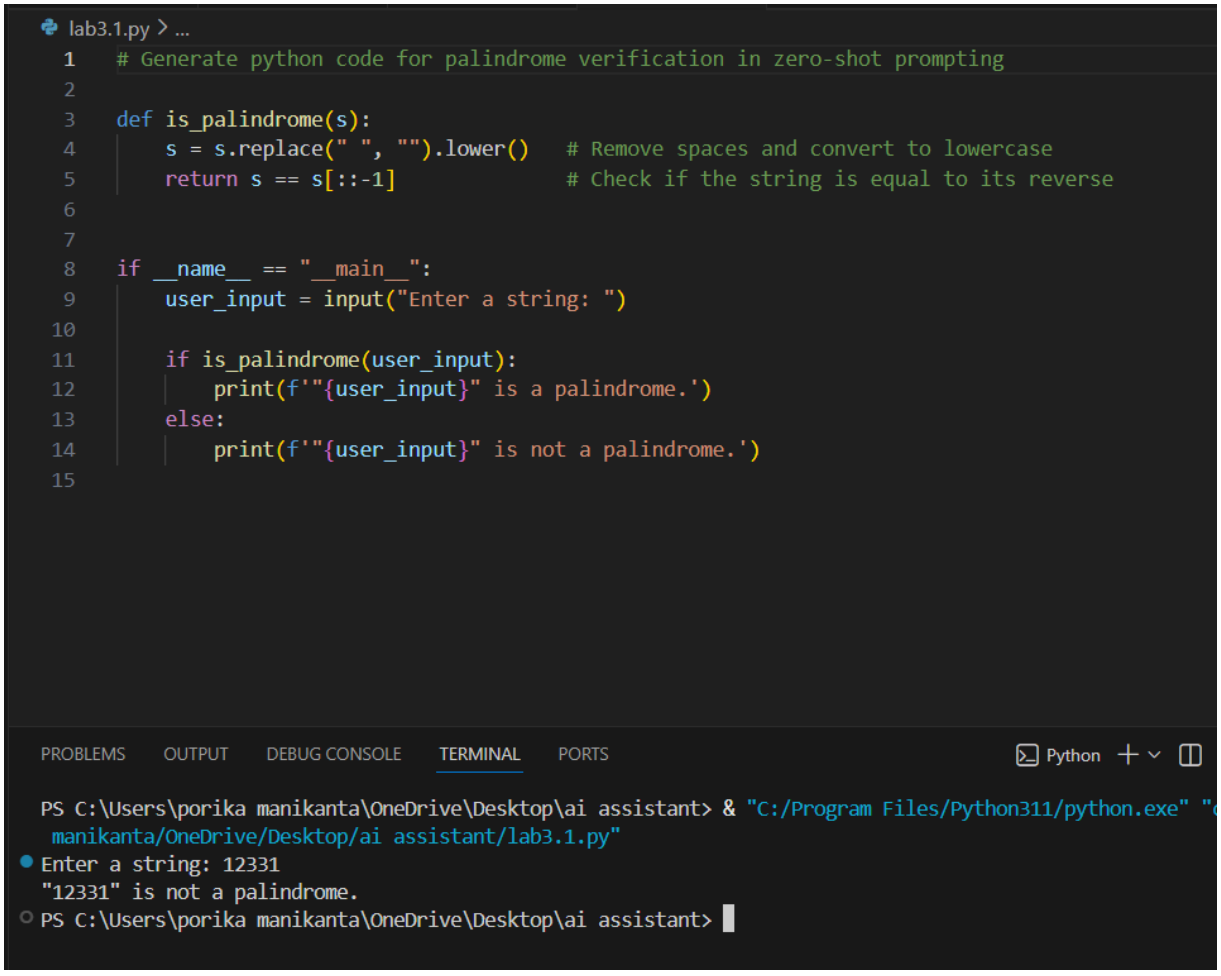
Question 1: Zero-Shot Prompting (Palindrome Number Program) Write a zero-shot prompt (without providing any examples) to generate a Python function that checks whether a given number is a palindrome **Code:**



Question 2: One-Shot Prompting (Factorial Calculation)

Write a one-shot prompt by providing one input-output example and ask the AI to generate a Python function to compute the factorial of a given number.

Code:

```
15
16  # Generate a python program for factorial calculation using one-shot prompting
17  # Example: Input: 5  Output: 120
18
19  def factorial(n):
20      if n == 0 or n == 1:
21          return 1
22      else:
23          return n * factorial(n - 1)
24
25
26  if __name__ == "__main__":
27      num = int(input("Enter a number to calculate its factorial: "))
28      result = factorial(num)
29      print(f"The factorial of {num} is {result}.")
30
31
```

```
ROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS                Python

S C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe"
manikanta/OneDrive/Desktop/ai assistant/lab3.1.py"
nter a number to calculate its factorial: 6
he factorial of 6 is 720.
S C:\Users\porika manikanta\OneDrive\Desktop\ai assistant>
```

Question 3: Few-Shot Prompting (Armstrong Number Check) Write a few-shot prompt by providing multiple input-output examples to guide the AI in generating a Python function to check whether a given number is an Armstrong number.

Code:

```python
# Write a python program to generate Armstrong numbers using few-shot prompting
# Example: Input: 153  Output: True
# Example: Input: 123  Output: False
# Example: Input: 370  Output: True

def is_armstrong(number):
    num_str = str(number)                # Convert number to string
    num_digits = len(num_str)            # Count number of digits

    # Calculate sum of digits raised to the power of number of digits
    sum_of_powers = sum(int(digit) ** num_digits for digit in num_str)

    return sum_of_powers == number         # Check Armstrong condition


if __name__ == "__main__":
    num = int(input("Enter a number to check if it's an Armstrong number: "))

    if is_armstrong(num):
        print(f"{num} is an Armstrong number.")
    else:
        print(f"{num} is not an Armstrong number.")
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS                    Python

PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "
 manikanta/OneDrive/Desktop/ai assistant/lab3.1.py"
Enter a number to check if it's an Armstrong number: 153
153 is an Armstrong number.
PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant>
```

Question 4: Zero-Shot Prompting (Perfect Number Check) Write a zero-shot prompt (without providing any examples) to generate a Python function that checks whether a given number is a perfect number.

Code:

```python
# Generate python program to check perfect number using zero-shot prompting

def is_perfect_number(n):
    # Calculate the sum of all proper divisors of n
    sum_of_divisors = sum(i for i in range(1, n) if n % i == 0)
    return sum_of_divisors == n


if __name__ == "__main__":
    number = int(input("Enter a number to check if it's a perfect number: "))

    if is_perfect_number(number):
        print(f"{number} is a perfect number.")
    else:
        print(f"{number} is not a perfect number.")
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS                    Python

PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "c:/U
 manikanta/OneDrive/Desktop/ai assistant/lab3.1.py"
Enter a number to check if it's a perfect number: 12
12 is not a perfect number.
PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "c:/U
 manikanta/OneDrive/Desktop/ai assistant/lab3.1.py"
Enter a number to check if it's a perfect number: 6
6 is a perfect number.
PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant>
```

Question 5: Few-Shot Prompting (Even or Odd Classification with Validation)

Write a few-shot prompt by providing multiple input-output examples to guide the AI in generating a Python program that determines whether a given number is even or odd, including proper input validation.

Code:

```python
# Generate python program to check Even or Odd Classification with Validation
# using few-shot prompting

# Example: Input: 4  Output: Even
# Example: Input: 7  Output: Odd
# Example: Input: 2  Output: Even

def check_even_odd(num):
    # Validate input type
    if not isinstance(num, int):
        return "Invalid input. Please enter an integer."

    # Check even or odd
    return "Even" if num % 2 == 0 else "Odd"


if __name__ == "__main__":
    try:
        user_input = int(input("Enter an integer to check if it's Even or Odd: "))
        result = check_even_odd(user_input)
        print(f"{user_input} is {result}.")
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS Python

```
PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "c:/U
 manikanta/OneDrive/Desktop/ai assistant/lab3.1.py"
Enter an integer to check if it's Even or Odd: 12
12 is Even.
PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "c:/U
 manikanta/OneDrive/Desktop/ai assistant/lab3.1.py"
Enter an integer to check if it's Even or Odd: 77
77 is Odd.
PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "c:/U
 manikanta/OneDrive/Desktop/ai assistant/lab3.1.py"
Enter an integer to check if it's Even or Odd: -55
-55 is Odd.
PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant>
```