

ASSIGNMENT-3.1  
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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 in True or False. Provide code in user input.

**Code with output:**

```
zeroshot(palindrome).py > ...
1 #write a python function to check given number is palindrome or not return output in True or False.provide code in user input
2 def is_palindrome(number):
3     # Convert the number to string
4     str_num = str(number)
5     # Check if the string is equal to its reverse
6     return str_num == str_num[::-1]
7 # Get user input
8 user_input = int(input("Enter a number: "))
9 # Check if the number is palindrome and print the result
10 result = is_palindrome(user_input)
11 print(result)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Docum
ents/AI(vs)/oneshot(factorial).py"
Enter a number: 5
120
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Docum
ents/AI(vs)/oneshot(factorial).py"
Enter a number: 9
362880
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Docum
ents/AI(vs)/oneshot(factorial).py"
Enter a number: 4
24
```

**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:**

```
oneshot(factorial).py > ...
1 #write a python function to calculate factorial of given number. Example: input=5 ; output=120
2 def factorial(n):
3     # Initialize result
4     result = 1
5     # Calculate factorial
6     for i in range(1, n + 1):
7         result *= i
8     return result
9 # Get user input
10 user_input = int(input("Enter a number: "))
11 # Calculate factorial and print the result
12 result = factorial(user_input)
13 print(result)
```

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** PORTS

```
PS C:\Users\akhil\OneDrive\Documents\AI(vs) & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Docum
ents/AI(vs)/oneshot(factorial).py"
Enter a number: 5
120
PS C:\Users\akhil\OneDrive\Documents\AI(vs) & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Docum
ents/AI(vs)/oneshot(factorial).py"
Enter a number: 9
362880
PS C:\Users\akhil\OneDrive\Documents\AI(vs) & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/OneDrive/Docum
ents/AI(vs)/oneshot(factorial).py"
Enter a number: 4
24
PS C:\Users\akhil\OneDrive\Documents\AI(vs) > 
```

### Justification:

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

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

Code with output:



```
contextmanaged(optimizednumberclassification).py > ...
1 #generate an optimized Python program that classifies a number is prime , composite or neither.
2 def classify_number(number):
3     if number <= 1:
4         return "Neither Prime nor Composite"
5     elif number == 2:
6         return "Prime"
7     elif number % 2 == 0:
8         return "Composite"
9     else:
10        for i in range(3, int(number**0.5) + 1, 2):
11            if number % i == 0:
12                return "Composite"
13        return "Prime"
14 # Get user input
15 user_input = int(input("Enter a number: "))
16 # Classify the number and print the result
17 result = classify_number(user_input)
18 print(result)

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [ ] [X] ...

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)/contextmanaged(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)/contextmanaged(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)/contextmanaged(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:**

```
zeroshot(perfectnumber).py > ...
1 #generate a python function to check given number is a perfect number
2
3 def is_perfect_number(number):
4     if number < 1:
5         return False
6     # Calculate the sum of divisors
7     divisors_sum = sum(i for i in range(1, number) if number % i == 0)
8     # A perfect number is equal to the sum of its proper divisors
9     return divisors_sum == number
10
11 # Get user input
12 user_input = int(input("Enter a number: "))
13 # Check if the number is a perfect number and print the result
14 result = is_perfect_number(user_input)
15 print(result)

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [ ] [X] ...

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)/zeroshot(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)/zeroshot(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)/zeroshot(perfectnumber).py"
Enter a number: -3
False
```

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

## Validation)

### Code with output:

```
fewshot(even or odd).py > ...
1  #generate a Python program that checks if a number is even or odd.
2  #example: input=4 ; output=Even
3  #example: input=7 ; output=Odd
4  #input=24 ; output=Even
5  def check_even_odd(number):
6      if number % 2 == 0:
7          return "Even"
8      else:
9          return "Odd"
10 # Get user input
11 user_input = int(input("Enter a number: "))
12 # Check if the number is even or odd and print the result
13 result = check_even_odd(user_input)
14 print(result)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/ot(even or odd).py"
Enter a number: 22
Even
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/ot(even or odd).py"
Enter a number: 447
Odd
PS C:\Users\akhil\OneDrive\Documents\AI(vs)> & C:/Users/akhil/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/akhil/ot(even or odd).py"
Enter a number: -55
Odd
```