Assignment-3.5

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Question 1: Zero-Shot Prompting (Leap Year Check)

Write a zero-shot prompt to generate a Python function that checks whether a given year is a leap year.

Task:

• Record the AI-generated code.

• Test with years like 1900, 2000, 2024.

• Identify logical flaws or missing conditions.

```
#Write a Python code to check whether a given year is a leap year or not.
year = input("Enter a year: ")
try:
    year = int(year)
    if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):
        print(f"{year} is a leap year")
    else:
        print(f"{year} is not a leap year")
except ValueError:
    print("Invalid input")
```

```
Enter a year: 1900
1900 is not a leap year
PS C:\Users\sriva\OneDrive\Documents\AI Assisted Code>
sisted Code/week 3"
Enter a year: 2000
2000 is a leap year
PS C:\Users\sriva\OneDrive\Documents\AI Assisted Code>
sisted Code/week 3"
Enter a year: 2024
2024 is a leap year
```

Question 2: One-Shot Prompting (GCD of Two Numbers) Write a one-shot prompt with one example to generate a Python function that finds the Greatest Common Divisor (GCD) of two numbers.

Example:

Input: 12, 18 → Output: 6

Task:

• Compare with a zero-shot solution.

• Analyze algorithm efficiency

```
'''
Input: 42, 56
Output: 14'''
def gcd(a, b):
    while b:
        a, b = b, a % b
    return a
print(gcd(12,18))
```

```
6
PS C:\Users\sriva\OneDrive\Docu
```

Question 3: Few-Shot Prompting (LCM Calculation)

Write a few-shot prompt with multiple examples to generate a Python function that computes the Least Common Multiple (LCM).

Examples:

• Input: 4, 6 → Output: 12

• Input: 5, 10 → Output: 10

• Input: 7, 3 → Output: 21

Task:

• Examine how examples guide formula selection.

• Test edge cases.

```
'''Input: 4, 6 → Output: 12
Input: 5, 10 → Output: 10
Input: 7, 3 → Output: 21
output:Display LCM of two numbers
'''
def lcm(x, y):
    if x > y:
        greater = x
    else:
        greater = y
    while True:
        if greater % x == 0 and greater % y == 0:
            lcm = greater
            break
        greater += 1
    return lcm
num1 = int(input("Enter first number: "))
num2 = int(input("Enter second number: "))
print("The LCM of", num1, "and", num2, "is", lcm(num1, num2))
```

```
Enter first number: 4
Enter second number: 6
The LCM of 4 and 6 is 12
```

Question 4: Zero-Shot Prompting (Binary to Decimal Conversion) Write a zero-shot prompt to generate a Python function that converts a binary number to decimal.

Task:

• Test with valid and invalid binary inputs.

• Identify missing validation logic.

```
#write a python code for conversion of binary to decimal in short and optimized way
binary_input = input("Enter a binary number: ")
decimal_output = int(binary_input, 2)
print(f"The decimal equivalent of binary {binary_input} is {decimal_output}")
```

```
Enter a binary number: 101
The decimal equivalent of binary 101 is 5
```

Question 5: One-Shot Prompting (Decimal to Binary Conversion)

Write a one-shot prompt with an example to generate a Python function that converts a decimal number to binary.

Example:

Input: 10 → Output: 1010

Task:

• Compare clarity with zero-shot output.

• Analyze handling of zero and negative numbers.

```
'''num=10
binary="1010"
'''
num=int(input())
binary=bin(num)[2:]
print(binary)
```

```
13
1101
```

Question 6: Few-Shot Prompting (Harshad Number Check) Write a few-shot prompt to generate a Python function that checks whether a number is a Harshad (Niven) number.

Examples:

• Input: 18 → Output: Harshad Number

• Input: 21 → Output: Harshad Number • Input: 19 → Output: Not a Harshad Number

Task:

• Test boundary conditions.

• Evaluate robustness

```
'''Input: 18
Output: Harshad Number
Input: 21
Output: Harshad Number
Input: 19
Output: Not a Harshad Number'''
num = int(input())
sum_of_digits = sum(int(digit) for digit in str(num))
if num % sum_of_digits == 0:
    print("Harshad Number")
else:
    print("Not a Harshad Number")
```

```
18
Harshad Number
```