AI ASSISTED CODING

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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.

CODE:

#write a program to check a year is leap year

```python
#write the code to check the leap year
n=int(input("Enter a year: "))
def is_leap_year(year):
    if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):
        return True
    else:
        return False
if is_leap_year(n):
    print("It is a leap year.")
else:
    print("It is not a leap year.")
```

OUTPUT:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)> & C:/Users/abhil/AppData
PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)> & C:/Users/abhil/AppData
/Local/Programs/Python/Python313/python.exe "c:/Users/abhil/OneDrive/Documents/Desk
top/python(AIAC)/Leap_yearcheck.py"
Enter a year: 2000
It is a leap year.
PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)> & C:/Users/abhil/AppData
/Local/Programs/Python/Python313/python.exe "c:/Users/abhil/OneDrive/Documents/Desk
top/python(AIAC)/Leap_yearcheck.py"
Enter a year: 2024
It is a leap year.
PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)>
```

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.

Code:write the code if 12,18=6 for this concept code has to generate

GCD.py > ...

```python
#write the code if 12 ,18=6 then write the code for that concept
def gcd(a, b):
    while b:
        a, b = b, a % b
    return a
num1 = int(input("Enter first number: "))
num2 = int(input("Enter second number: "))
print(f"The GCD of {num1} and {num2} is {gcd(num1, num2)}")

```

- Examine improvements in clarity and correctness.

CODE:

-

```python
#write the code if 12 ,18=6 then write the code for that concept
def gcd(a, b):
    while b:
        a, b = b, a % b
    return a
num1 = int(input("Enter first number: "))
num2 = int(input("Enter second number: "))
print(f"The GCD of {num1} and {num2} is {gcd(num1, num2)}")

```

Output:

```
PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)> & C:/Users/abhi
/Local/Programs/Python/Python313/python.exe "c:/Users/abhil/OneDrive/Docum
top/python(AIAC)/GCD.py"
Enter first number: 12
Enter second number: 18
The GCD of 12 and 18 is 6
PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)>
```

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.

Code: if 4,6=12 or 5,10=10, or 2,3,=6 then write the code for that concept

#display lcm of two numbers

Input/outputs:

```python
#if 4,6=12 or 5,10=10, or 2,3,=6 then write the code for that concept
#display lcm of two numbers
def lcm(a, b):
    def gcd(x, y):
        while y:
            x, y = y, x % y
        return x
    return abs(a * b) // gcd(a, b)
num1 = int(input("Enter first number: "))
num2 = int(input("Enter second number: "))
print(f"The LCM of {num1} and {num2} is {lcm(num1, num2)}")
```

```
NameError: name 'gcd' is not defined
PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)> & C:/Users/abhil/A
/Local/Programs/Python/Python313/python.exe "c:/Users/abhil/OneDrive/Document
top/python(AIAC)/lcm code.py"
Enter first number: 2
Enter second number: 3
The LCM of 2 and 3 is 6
PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)>
```

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

Code:

Write the python code to convert binary to decimal

Binary to decimal.py > ...

```python
#Binary to decimal conversion python code
def binary_to_decimal(binary_str):
    decimal_value = 0
    binary_str = binary_str[::-1]  # Reverse the string to process from least
    for index, digit in enumerate(binary_str):
        if digit == '1':
            decimal_value += 2 ** index
    return decimal_value
binary_input = input("Enter a binary number: ")
decimal_output = binary_to_decimal(binary_input)
print(f"The decimal value of binary {binary_input} is {decimal_output}")
```

Inputs/output:

```
PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)> & C:/Users/abhil/AppDat
/Local/Programs/Python/Python313/python.exe "c:/Users/abhil/OneDrive/Documents/Des
top/python(AIAC)/Binary to decimal.py"
Enter a binary number: 1005
The decimal value of binary 1005 is 8
PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)>
```

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.

Code:

#if input 10 output is 1010

#display and write a python code to convert decimal to binary

```python
#if input 10 output is 1010
#write a python code to convert decimal to binary
def decimal_to_binary(n):
    if n == 0:
        return "0"
    binary_str = ""
    while n > 0:
        binary_str = str(n % 2) + binary_str
        n = n // 2
    return binary_str
decimal_input = int(input("Enter a decimal number: "))
binary_output = decimal_to_binary(decimal_input)
print(f"The binary value of decimal {decimal_input} is {binary_output}")
```

Output:

```
PS C:\Users\abhil\OneDrive\Documents\Desktop\python(AIAC)> & C:/Users/abhil/AppData
/Local/Programs/Python/Python313/python.exe "c:/Users/abhil/OneDrive/Documents/Desk
top/python(AIAC)/Binary to decimal.py"
Enter a binary number: 12
The decimal value of binary 12 is 2
Enter a decimal number:
```

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

Code: #Input: 18 → Output: Harshad Number
#Input: 21 → Output: Harshad Number
#Input: 19 → Output: Not a Harshad Number
#dispplay and write a python code to check harshad number

```python
#Input: 18 → Output: Harshad Number
 #Input: 21 → Output: Harshad Number
 #Input: 19 → Output: Not a Harshad Number
#dispplay and write a python code to check harshad number
def is_harshad_number(n):
    digit_sum = sum(int(digit) for digit in str(n))
    return n % digit_sum == 0
number = int(input("Enter a number: "))
if is_harshad_number(number):
    print(f"{number} is a Harshad Number.")
```

Inputs/outputs: