AI ASSISTED CODING

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Assignment—3.5

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 with prompt:

```python
#write a python program to check whether the given year is a leap year or not
year=int(input("enter a 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")
```

OUTPUT:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

enter a year:1900
1900 is not a leap year
PS C:\Users\nithi\Desktop\ai assisted coding> & C:/Users/nithi/AppData/Local/Programs/Python/Python312/python.ex
ero shot.py"
enter a year:2000
2000 is a leap year
PS C:\Users\nithi\Desktop\ai assisted coding>
```

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.

Code with prompt:

```python
# a=12,18
# display the gcd of the given numbers is 6
#write a python program to find the gcd of two numbers
def gcd(x,y):
    while(y):
        x,y=y,x%y
    return x
a=int(input("enter first number:"))
b=int(input("enter second number:"))
print(f"The gcd of {a} and {b} is {gcd(a,b)}")
```

Output:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\nithi\Desktop\ai assisted coding> & C:/Users/nithi/AppData/Local/Progr
 shot gcd.py"
enter first number:12
enter second number:18
The gcd of 12 and 18 is 6
PS C:\Users\nithi\Desktop\ai assisted coding>
```

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 with prompt:

```python
#a=4,6
#display the lcm of the given numbers is 12
#a=5,10
#display the lcm of the given numbers is 10
#write a python program to find the 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
a=int(input("enter first number:"))
b=int(input("enter second number:"))
print(f"The lcm of {a} and {b} is {lcm(a,b)}")
```

Inputs/outputs:

```
ewshot lcm.py"
enter first number:4
enter second number:6
The lcm of 4 and 6 is 12
PS C:\Users\nithi\Desktop\ai assisted coding>
```

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 with prompt:

zero shot binary to decimal.py > ...

```python
#write a python program to convert a binary number to decimal
binary=int(input("enter a binary number:"))
decimal=0
power=0
while binary>0:
    decimal+=((binary%10)*2**power)
    binary//=10
    power+=1
print(f"The decimal equivalent is {decimal}")
```

Inputs/outputs:

```
enter a binary number:111
The decimal equivalent is 7
PS C:\Users\nithi\Desktop\ai assisted coding> & C:/Users/nithi/AppData/Local/Programs/Python/Python312/python.exe
ero shot binary to decimal.py"
enter a binary number:1110
The decimal equivalent is 14
PS C:\Users\nithi\Desktop\ai assisted coding>
```

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.

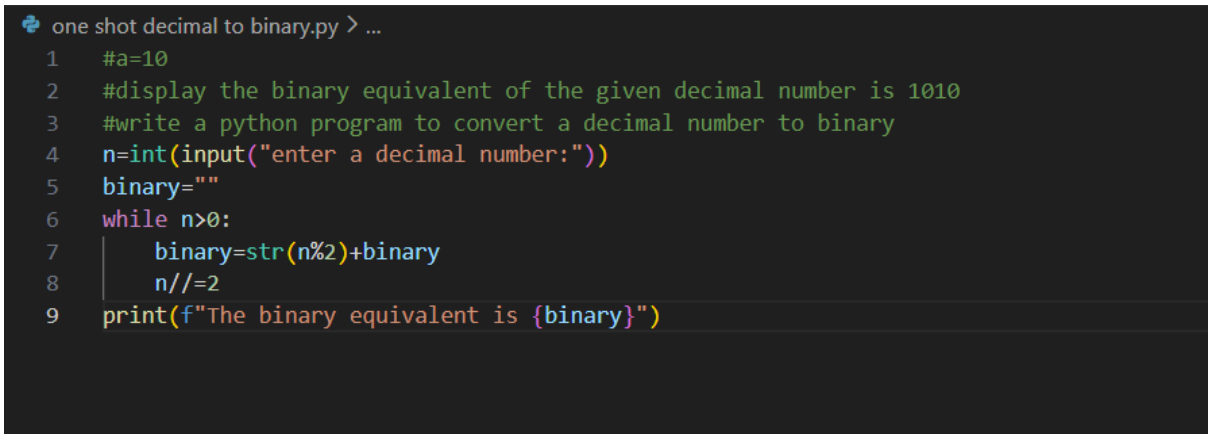
Example:

Input: 10 → Output: 1010

Task:

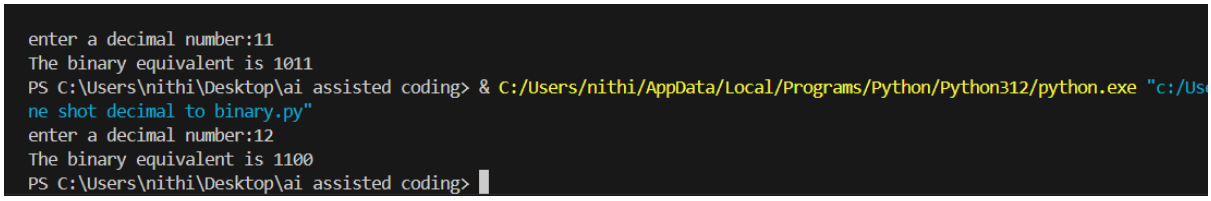
- Compare clarity with zero-shot output.
- Analyze handling of zero and negative numbers.

Code with prompt:



```
one shot decimal to binary.py > ...
1   #a=10
2   #display the binary equivalent of the given decimal number is 1010
3   #write a python program to convert a decimal number to binary
4   n=int(input("enter a decimal number:"))
5   binary=""
6   while n>0:
7       binary=str(n%2)+binary
8       n//=2
9   print(f"The binary equivalent is {binary}")
```

Inputs/outputs:



```
enter a decimal number:11
The binary equivalent is 1011
PS C:\Users\nithi\Desktop\ai assisted coding> & C:/Users/nithi/AppData/Local/Programs/Python/Python312/python.exe "c:/Us
ne shot decimal to binary.py"
enter a decimal number:12
The binary equivalent is 1100
PS C:\Users\nithi\Desktop\ai assisted coding>
```

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 and prompt:

few harshad number.py > ...

```python
#a=18
#display the harshad number is 18
#a=21
#display the harshad number is 21
#a=19
#display the harshad number is not 19
#write a python program to check whether a number is a harshad number or not
def is_harshad(num):
    sum_of_digits=0
    temp=num
    while temp>0:
        digit=temp%10
        sum_of_digits+=digit
        temp//=10
    if num%sum_of_digits==0:
        return True
    else:
        return False
n=int(input("enter a number:"))
if is_harshad(n):
    print(f"{n} is a harshad number")
else:
    print(f"{n} is not a harshad number")
```

Input and outputs:

```
enter a number:21
21 is a harshad number
PS C:\Users\nithi\Desktop\ai assisted coding> & C:/Users/nithi/AppData/Local/Programs/Python/Python312/python.exe "c:/Users/nithi/Desktop/ai
ew harshad number.py"
enter a number:19
19 is not a harshad number
PS C:\Users\nithi\Desktop\ai assisted coding>
```