ASSIGNMENT 1

PROBLEM 1:
To find the GCD of two no.
EXPLAINATION:

The math module contains many mathematical functions
By writing import math, I am telling Python:
“I want to use the built-in math functions.”
math.gcd(n1, n2) → directly gives the GCD of two numbers.

Example: if n1 = 330 and n2 = 18 it will give the result 6 as GCD .

01_Problem.py > ...

```python
# To find the GCD of two no.

import math
n1=int(input("Enter the no.:"))
n2=int(input("Enter the no.:"))
print("GCD is :",math.gcd(n1,n2))

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\gupta\OneDrive\Desktop\python class\Assignment 1> & C:/Users/gupta/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/gupta/OneDrive/Desktop/python class/Assignment 1/01_Problem.py"
Enter the no.:330
Enter the no.:18
GCD is : 6
PS C:\Users\gupta\OneDrive\Desktop\python class\Assignment 1>
```

PROBLEM 2 :

To find the factorial of any given positive no.

EXPLANATION :

1.The program asks the user to enter a number.
2.int() converts the input into an integer.
3.range(1,n+1) generates no. from 1 to n.
4.f"" is a formatted string.
5.{n}will be replaced by the input and the factorial will be replaced by the result.
for input 5 it prints 120.

02_Problem.py > ...

```python
# To find the factorial of any given positive no.

n=int(input('Enter the no :'))
product=1
for i in range(1,n+1):
    product=product*i
print(f"the factorial of {n} is {product}")
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
ta/OneDrive/Desktop/python class/Assignment 1/02_Problem.py"
Enter the no :5
the factorial of 5 is 120
PS C:\Users\gupta\OneDrive\Desktop\python class\Assignment 1>
```

PROBLEM 3 :

```
# To print the sum of the digits of a positive integer n
# ex.1234=1+2+3+4=10
```

EXPLAINATION:

Step 1: n % 10 gives the last digit.
Example: 1234 % 10 = 4.

Step 2: Add that digit to sum_digits.
Example: sum_digits = 0 + 4 = 4.

Step 3: n // 10 removes the last digit.
Example: 1234 // 10 = 123.

The loop continues until n becomes 0.

03_Problem.py > sum_digits

```python
# To print the sum of the digits of a positive integer n
# ex.1234=1+2+3+4=10

n = int(input("Enter a positive integer: "))
sum_digits = 0
temp = n    # keep a copy of n for display
while n > 0:
    digit = n % 10          # extract last digit
    sum_digits += digit     # add digit to sum
    n = n // 10             # remove last digit
print("Sum of digits of", temp, "is:", sum_digits)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
ta/OneDrive/Desktop/python class/Assignment 1/03_Problem.py"
Enter a positive integer: 1234
Sum of digits of 1234 is: 10
PS C:\Users\gupta\OneDrive\Desktop\python class\Assignment 1>
```

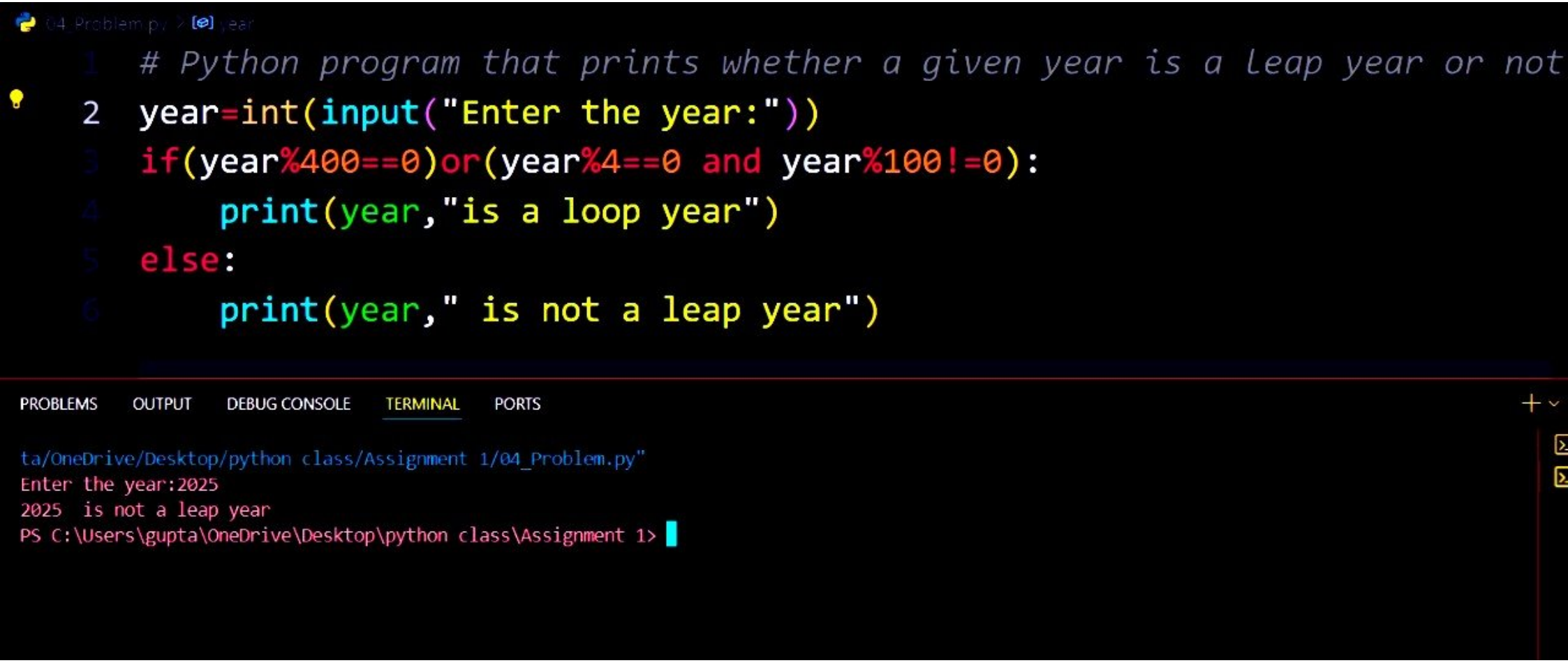
PROBLEM 4 :

Python program that prints whether a given year is a leap year or not.

EXPLAINATION :

A year is a leap year if:

It is divisible by 400, OR
It is divisible by 4 but not divisible by 100.
So in this case 2025 is not divisible by 400 or 4 so it is not a leap year


04_Problem.py > year
# Python program that prints whether a given year is a leap year or not
year=int(input("Enter the year:"))
if(year%400==0)or(year%4==0 and year%100!=0):
print(year,"is a loop year")
else:
print(year," is not a leap year")
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
ta/OneDrive/Desktop/python class/Assignment 1/04_Problem.py"
Enter the year:2025
2025 is not a leap year
PS C:\Users\gupta\OneDrive\Desktop\python class\Assignment 1>

PROBLEM 5 :

Python Program that takes as input the time of the day,and greets good morning,...
EXPLAINATION:
Ask the user to enter the current hour in 24-hour format (0-23).

Use if elif else conditions:
If time is between 0 and 12 → Good Morning
If time is between 12 and 17 → Good Afternoon
If time is between 17 and 21 → Good Evening
If time is between 21 and 24 → Good Night
If time is invalid like in -7:00 am or pm : print invalid hour .

05_Problem.py > hour

```python
# Python Program that takes as input the time of the day,and greets good morning,...

hour =int(input("Enter the hour:"))
if 0<=hour<12:
    print("Good morning !")
elif 12<=hour<17:
    print("Good Afternoon !")
elif 17<=hour<21:
    print("Good Evening !")
elif 21<=hour<24:
    print("Good night")
else:
    print("Invalid hour! Please enter between 0 and 23.")
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
ta/OneDrive/Desktop/python class/Assignment 1/05_Problem.py"
Enter the hour:12
Good Afternoon !
PS C:\Users\gupta\OneDrive\Desktop\python class\Assignment 1>
```

PROBLEM 6 :

Rock, Paper,Scissor game
EXPLANATION :
Import the random module to let the computer make a random choice.

Take the user's choice as input (rock, paper, or scissors).

Generate the computer's choice using random.choice().

Compare both choices using if-elif-else.

If both choices are the same → it’s a tie.

If the user’s choice beats the computer’s → user wins.

Otherwise → computer wins.

Print the result.

06_Problem.py > ...

```python
import random
# Available choices
choices = ["rock", "paper", "scissors"]
# User input
user_choice = input("Enter your choice (rock/paper/scissors): ").lower()
# Computer choice (random)
computer_choice = random.choice(choices)

print("You chose:", user_choice)
print("Computer chose:", computer_choice)

# Game logic
if user_choice == computer_choice:
    print("It's a tie!")
elif (user_choice == "rock" and computer_choice == "scissors") \
     or (user_choice == "scissors" and computer_choice == "paper") \
     or (user_choice == "paper" and computer_choice == "rock"):
    print("You win! 🎉")
elif user_choice in choices:
    print("Computer wins!")
else:
    print("Invalid input! Please choose rock, paper, or scissors.")
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
Enter your choice (rock/paper/scissors): rock
You chose: rock
Computer chose: scissors
You win! 🎉
PS C:\Users\gupta\OneDrive\Desktop\python class\Assignment 1>
```