Assignment 1 Completed By Adarsh Tiwari

Problem 1: Find GCD of Two Numbers

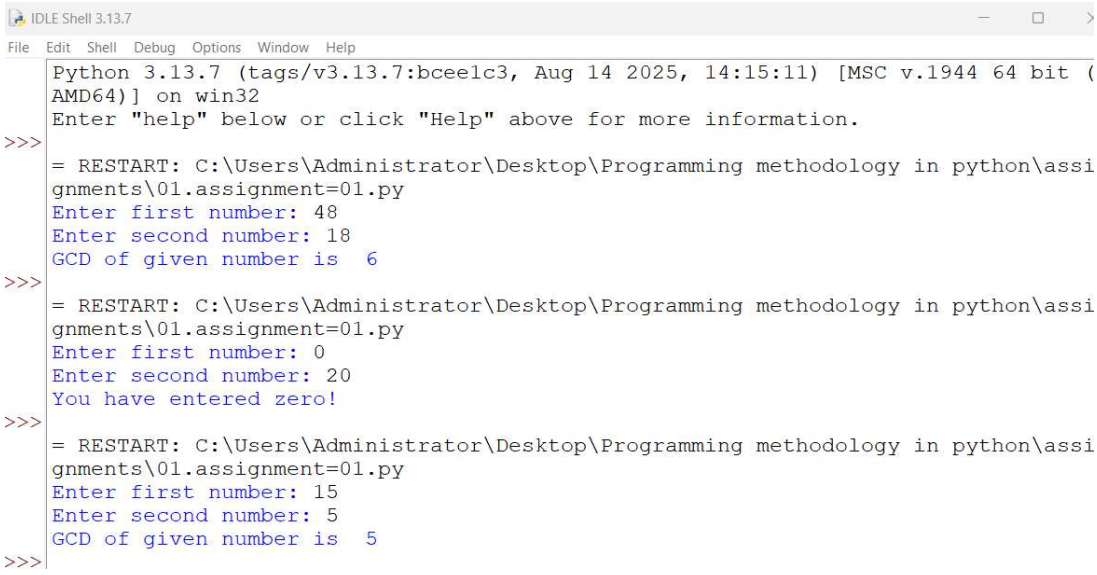
Statement: Write a Python program to find the GCD of two numbers (take input from the user).

Approach:

1. Take two integers as input.
2. If either number is zero, display a message.
3. Otherwise, find the smaller number, loop backward from it to 1, and check divisibility.
4. The first number that divides both is the GCD. Print it.**Code:**

```
num1 = int(input("Enter first number: "))
num2 = int(input("Enter second number: "))

if num1 == 0 or num2 == 0:
    print('You have entered zero!')
else:

    n = min(num1, num2)

    for i  in range(n, 0, -1):
        if (num1 % i == 0) and (num2 % i ==0):
            print("GCD of given number is ", i)
            break
```

Sample Runs:



Problem 2: Factorial of a Positive Integer

Statement: Write a Python program to find the factorial of any given positive integer (take input from the user).

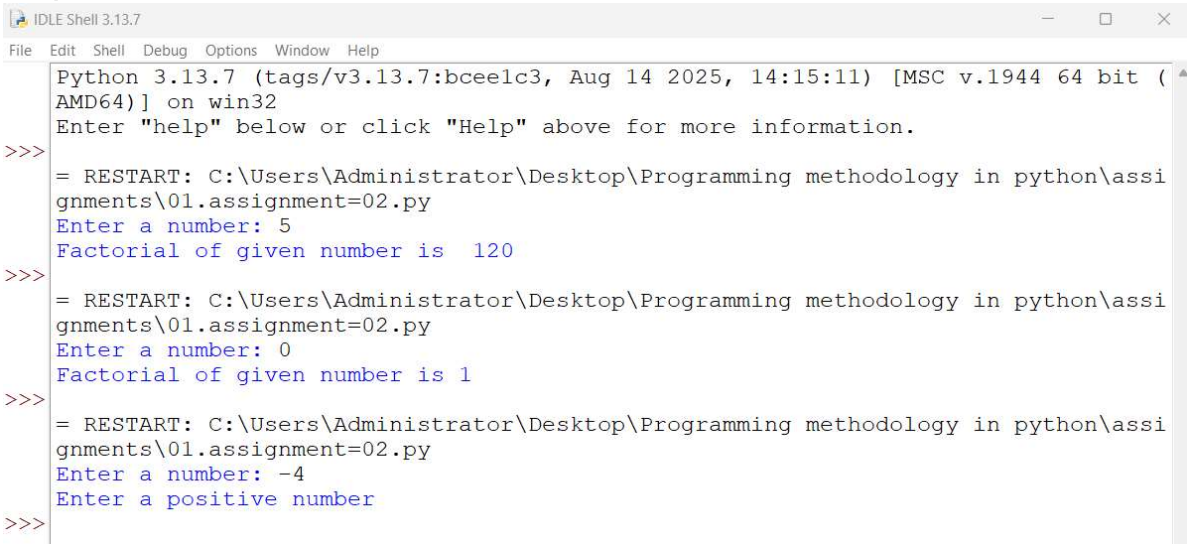
Approach:

1. Take integer input n.
2. If n < 0, print error.
3. If n is 0 or 1, factorial is 1.
4. Else, loop from 2 to n, multiplying to get factorial.
5. Print factorial.

Code:

```
n = int( input("Enter a number: "))

if n<0:
    print("Enter a positive number")

elif n == 0 or n == 1:
    print("Factorial of given number is 1")

else:
    f = 1
    for i in range(2, n+1):
        f = f*i
    print("Factorial of given number is ", f)
```

Sample Runs:



Problem 3: Sum of Digits of a Positive Integer

Statement: Write a program that prints the sum of the digits of a positive integer n. For example, if n = 1234, then output: 1 + 2 + 3 + 4 = 10.

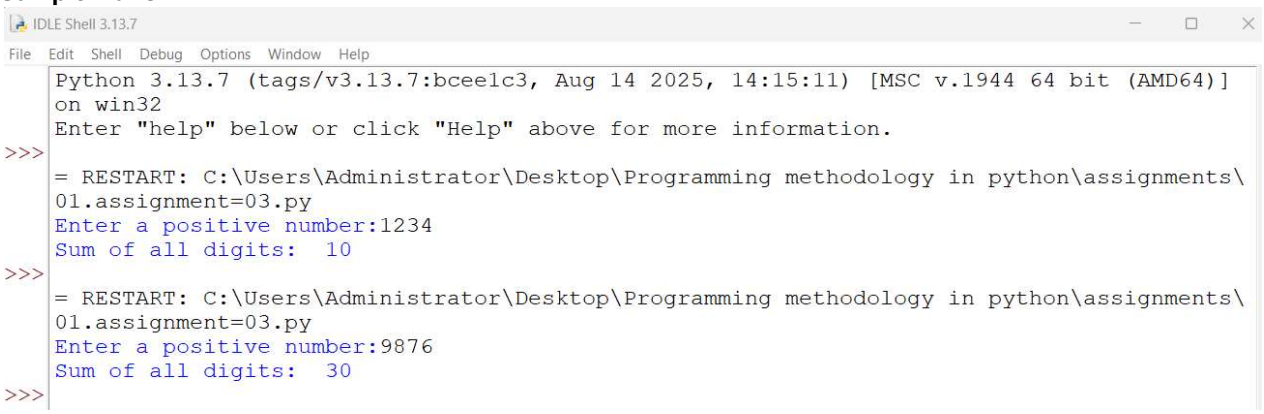
Approach:

1. Take number input as string.
2. Initialize sum counter c=0.
3. Loop through each character, convert to int, add to c.
4. Print final sum.

Code

```
n = input('Enter a positive number:')

c = 0

for i in n:

    c = c + int(i)

print('Sum of all digits: ', c)
```

Sample Runs:



Problem 4: Leap Year Checker

Statement: Write a Python program that prints whether a given year is a leap year or not. Input 1900 should output 'Not a leap year'.

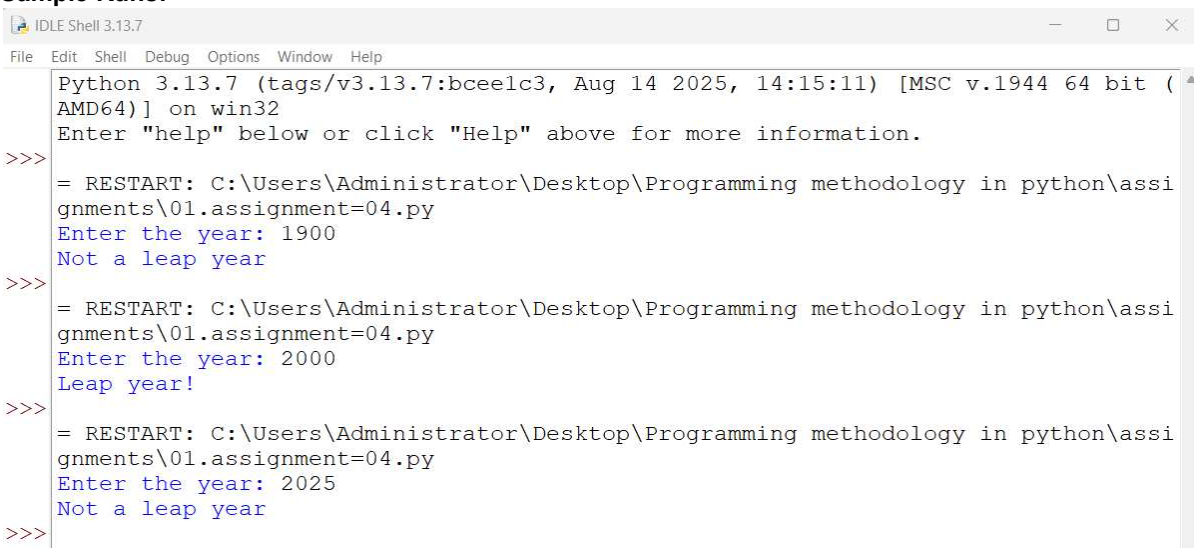
Approach:

1. Take year input.
2. If divisible by 400 → Leap year.
3. Else if divisible by 4 but not 100 → Leap year.
4. Else → Not a leap year.
5. Print result.

Code:

```
n = (int(input("Enter the year:
")))

if n % 400 == 0:
    print('Leap year!')

elif n%100 != 0 and n%4 == 0:
    print('Leap year!')

else:
    print('Not a leap year')
```

Sample Runs:



Problem 5: Time-based Greeting Program

Statement: Write a Python program that takes as input the time of the day, and greets Good Morning, Good Afternoon, or Good Evening depending on the time.

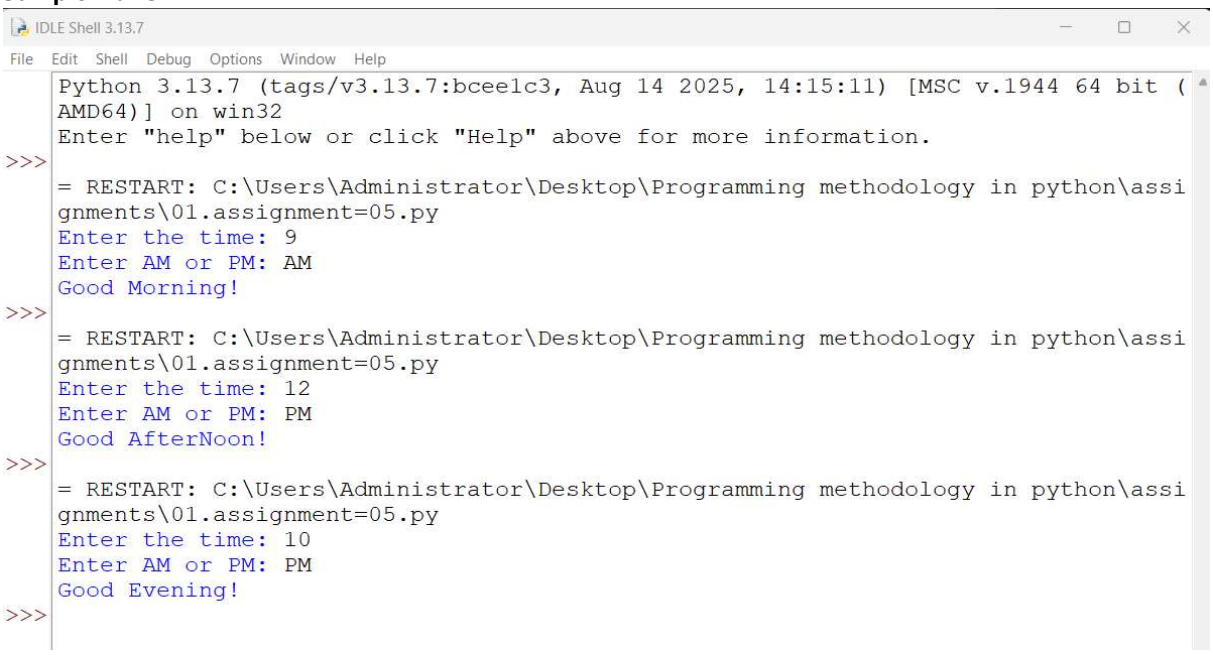
Approach:

1. Take hour input and AM/PM.
2. If AM: 1-11 → Morning, 12 → Evening.
3. If PM: 12 or 1-5 → Afternoon, 6-11 → Evening.
4. Else → Invalid.
5. Print greeting.

Code:

```
time = int(input("Enter the time: " ))

mer = input("Enter AM or PM: ")

if mer.upper() == 'AM':
    if time >= 1 and time <= 11:
        print("Good Morning!")
    elif time == 12:
        print("Good Evening!")

elif mer.upper() == 'PM':
    if time == 12 or (time >= 1 and time <= 5):
        print("Good AfterNoon!")
    elif time > 5 and time <= 11:
        print("Good Evening!")

else:
    print("Invalid Time!")
```

Sample Runs:



Problem 6: Rock, Paper, Scissors Game

Statement: Write a Python program to play Rock, Paper, Scissors with the computer. Keep score of wins, losses, and ties.

Approach:

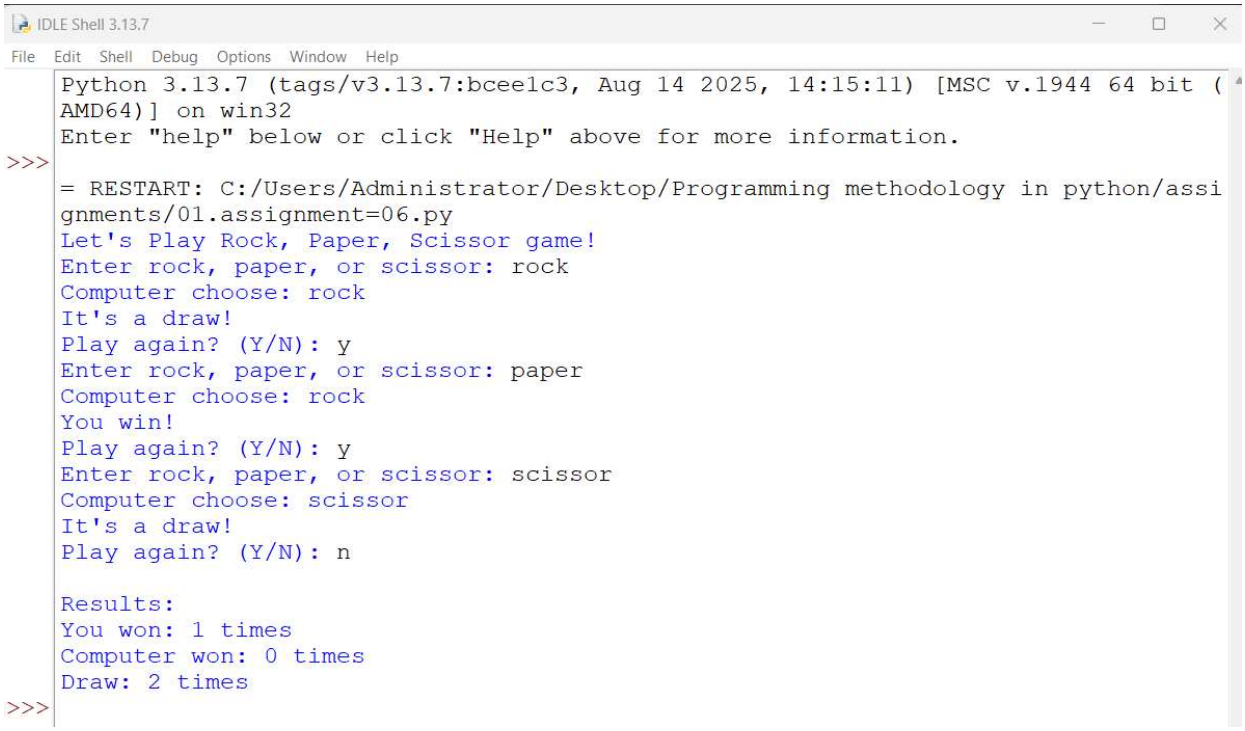
1. Import random module.

2. Define choices list.
3. Initialize counters.
4. Use while True loop for rounds.
5. Get user input, validate, pick random computer choice.
6. Compare and update counters.
7. Ask to play again, break if not.
8. Print final results.

Code:

```
import random

print("Let's Play Rock, Paper, Scissor game!")

choices = ["rock", "paper", "scissor"]
draw_count = comp_count = user_count = 0

while True:
    user = input("Enter rock, paper, or scissor: ").lower()
    if user not in choices:
        print("Invalid choice, try again.")
        continue

    comp = random.choice(choices)
    print("Computer choose:", comp)

    if user == comp:
        print("It's a draw!")
        draw_count += 1
    elif (user == "rock" and comp == "scissor") or \
         (user == "paper" and comp == "rock") or \
         (user == "scissor" and comp == "paper"):
        print("You win!")
        user_count += 1
    else:
        print("You lose!")
        comp_count += 1

    if input("Play again? (Y/N): ").upper() != 'Y':
        break

print()
print('Results: ')
print('You won:', user_count, 'times')
print('Computer won:', comp_count, 'times')
print('Draw:', draw_count, 'times')
```

Sample Runs:



Thankyou.