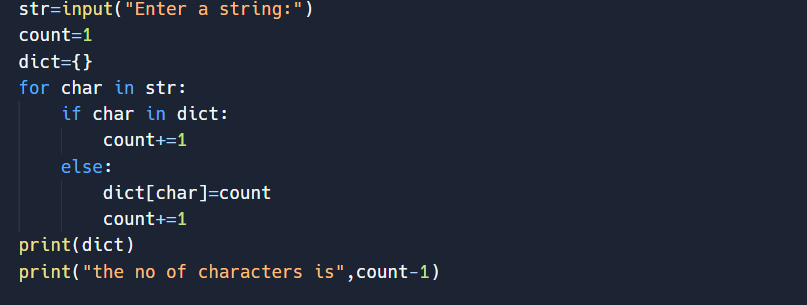
**MIS:112315139**

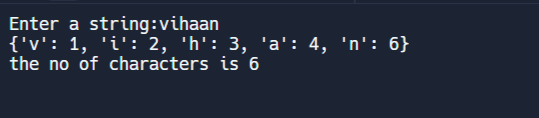
**GROUP-4**

**NAME: VIHAAN**

**Q1)**

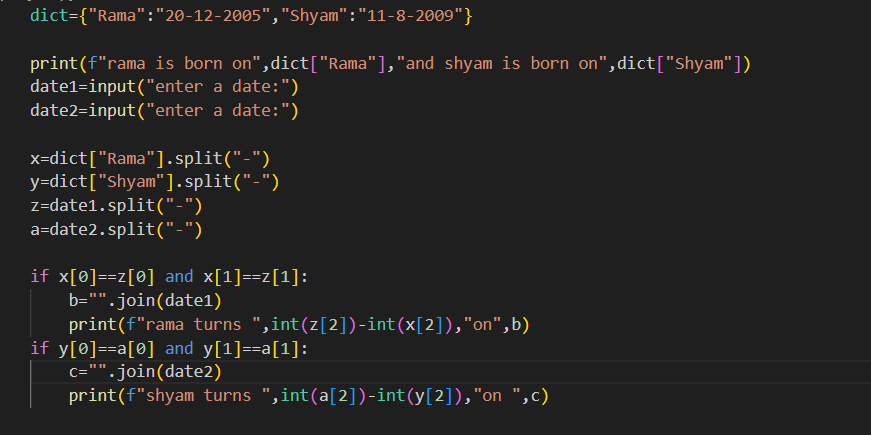
**Code:**

****

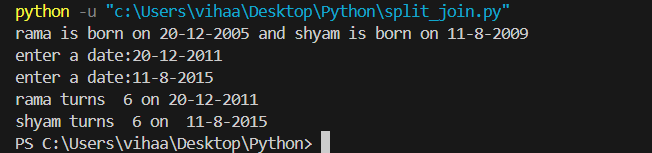
**Output:  
**

**Q2)**

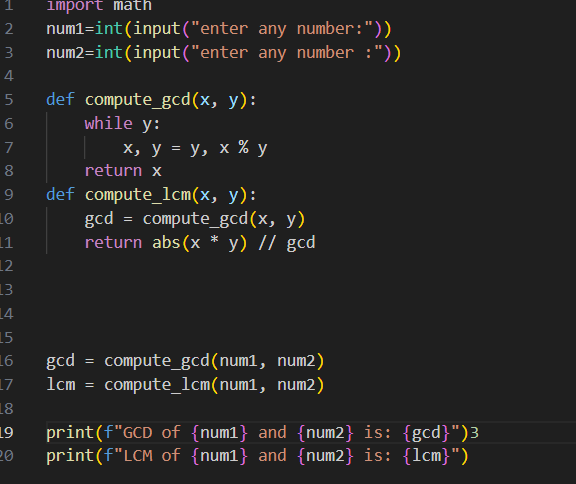
**Code:**

****

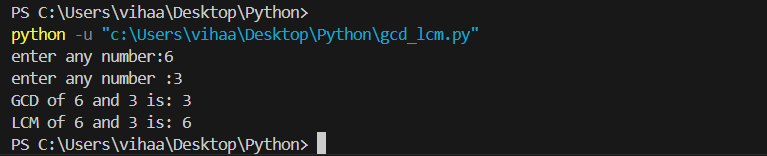
**Output:**

****

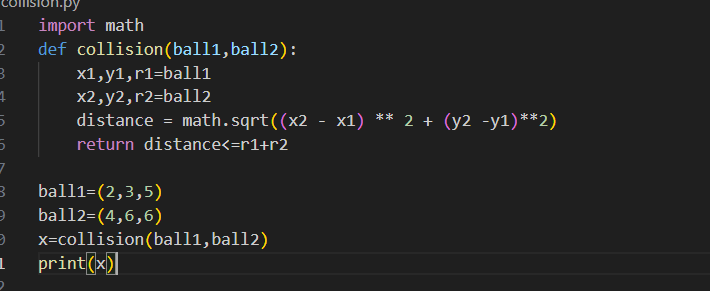
**Q3)**

****

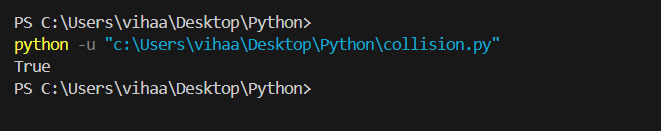
**Output:**

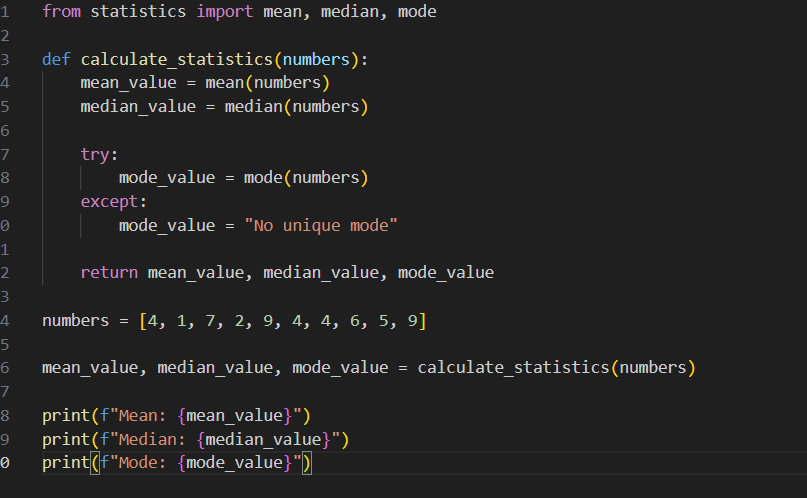
****

**Q4)**

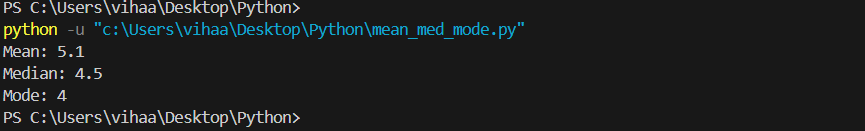
****

**Output:**

****

**Q5)** ****

Output:

****

**Q6)**

**def bubble\_sort(arr):**

**n = len(arr)**

**for i in range(n):**

**for j in range(0, n-i-1):**

**if arr[j] > arr[j+1]:**

**arr[j], arr[j+1] = arr[j+1], arr[j]**

**def merge\_sort(arr):**

**if len(arr) > 1:**

**mid = len(arr) // 2**

**left\_half = arr[:mid]**

**right\_half = arr[mid:]**

**merge\_sort(left\_half)**

**merge\_sort(right\_half)**

**i = j = k = 0**

**while i < len(left\_half) and j < len(right\_half):**

**if left\_half[i] < right\_half[j]:**

**arr[k] = left\_half[i]**

**i += 1**

**else:**

**arr[k] = right\_half[j]**

**j += 1**

**k += 1**

**while i < len(left\_half):**

**arr[k] = left\_half[i]**

**i += 1**

**k += 1**

**while j < len(right\_half):**

**arr[k] = right\_half[j]**

**j += 1**

**k += 1**

**def selection\_sort(arr):**

**n = len(arr)**

**for i in range(n):**

**min\_idx = i**

**for j in range(i+1, n):**

**if arr[j] < arr[min\_idx]:**

**min\_idx = j**

**arr[i], arr[min\_idx] = arr[min\_idx], arr[i]**

**def insertion\_sort(arr):**

**for i in range(1, len(arr)):**

**key = arr[i]**

**j = i - 1**

**while j >= 0 and key < arr[j]:**

**arr[j + 1] = arr[j]**

**j -= 1**

**arr[j + 1] = key**

**def switch\_case(sort\_type, arr):**

**if sort\_type == 1:**

**print("Performing Bubble Sort...")**

**bubble\_sort(arr)**

**elif sort\_type == 2:**

**print("Performing Merge Sort...")**

**merge\_sort(arr)**

**elif sort\_type == 3:**

**print("Performing Selection Sort...")**

**selection\_sort(arr)**

**elif sort\_type == 4:**

**print("Performing Insertion Sort...")**

**insertion\_sort(arr)**

**else:**

**print("Invalid choice")**

**print("Sorted array is:", arr)**

**if \_\_name\_\_ == "\_\_main\_\_":**

**arr = [64, 34, 25, 12, 22, 11, 90]**

**print("Choose the sorting algorithm:")**

**print("1. Bubble Sort")**

**print("2. Merge Sort")**

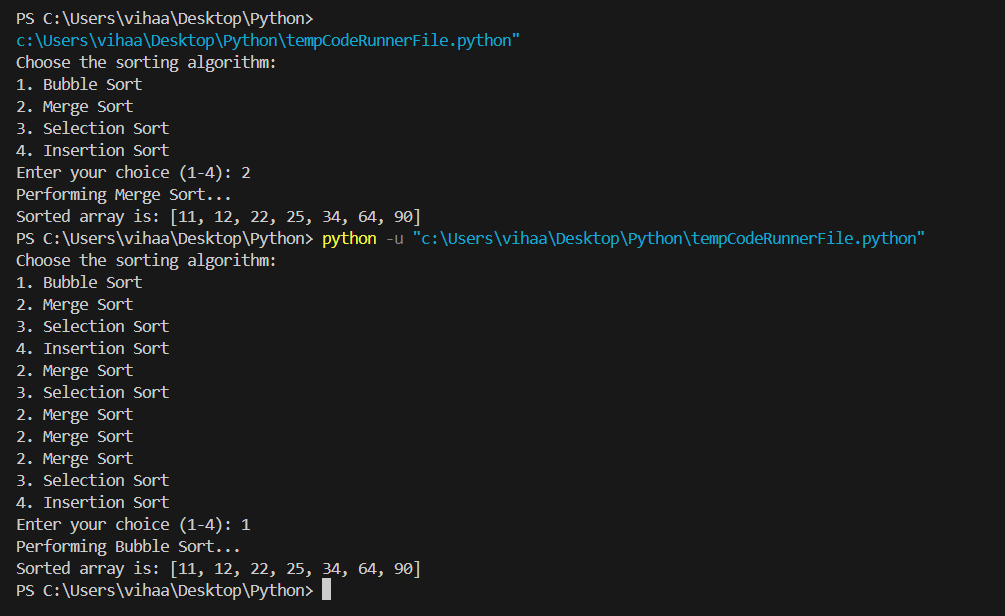
**print("3. Selection Sort")**

**print("4. Insertion Sort")**

**choice = int(input("Enter your choice (1-4): "))**

**switch\_case(choice, arr)**

**output:**

****