1. Problem Statement

Rosh is intrigued by numerical patterns. Today, she stumbled upon a puzzle while working with arrays. She wants to compute the sum of the third-largest and second-smallest elements from a list of integers. She seeks your help to implement a program that solves this for her efficiently.

Input Format

The first line of input is an integer N, representing the size of the array.

The second line of input consists of N space-separated integers, representing the elements of the array.

Output Format

The output displays a single integer representing the sum of the third-largest and second-smallest elements in the array.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 10
10 20 30 40 50 60 70 80 90 100
Output: 100

Answer

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        Scanner scanner =new Scanner(System.in);
        int N=scanner.nextInt();
        int arr1[]=new int[N];
        int arr2[]=new int[N];
        int k=0;
        for(int i=0;i<N;i++){
            arr1[k]=scanner.nextInt();
            k=k+1;
        }
        for (int j = 0; j < arr1.length - 1; j++) {
            if (arr1[j] < arr1[j + 1]) {
                int temp = arr1[j];
                arr1[j] = arr1[j + 1];
                arr1[j + 1] = temp;
                j = -1;
            }
        }
        int result=0;
        result=result+arr1[2]+arr1[arr1.length-2];
        System.out.println(result);
        scanner.close();
    }
}
```

Write a program to help Monica find the diagonal sum of a square 2D array.

Note: The main diagonal of the array consists of the elements traversing from the top-left corner to the bottom-right corner. The secondary diagonal includes elements from the top-right corner to the bottom-left corner.

Input Format

The first line of input consists of an integer N, representing the number of rows and columns.

The following N lines consist of N space-separated integers, representing the 2D array elements.

Output Format

The first line of output prints "Sum of the main diagonal: " followed by an integer, representing the sum of the main diagonal.

The second line prints "Sum of the secondary diagonal: " followed by an integer, representing the sum of the secondary diagonal.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3
1 2 3
4 5 6
7 8 9
Output: Sum of the main diagonal: 15
Sum of the secondary diagonal: 15

Answer

```
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int size = scanner.nextInt();
        int[][] arr = new int[size][size];
        for (int i = 0; i < size; i++) {
            for (int j = 0; j < size; j++) {
                arr[i][j] = scanner.nextInt();
            }
        }
        int sum1 = 0;
        for (int i = 0; i < arr.length; i++) {
            sum1 += arr[i][i];
        }
        int sum2 = 0;
        for (int i = 0; i < arr.length; i++) {
            sum2 += arr[i][arr.length - 1 - i];
        }
        System.out.println("Sum of the main diagonal: " + sum1);
        System.out.println("Sum of the secondary diagonal: " + sum2);
        scanner.close();
    }
}
```

1. Problem Statement

You are developing a warehouse management system for a shipping company. The system uses an integer array to represent the weights of packages in a specific order. To verify that the weight capacity is not exceeded, the program needs to calculate the sum of the weights of the first and last packages in the list.

Task:

Write a code to calculate the sum of the weights of the first and last packages in the list. The program should take an integer array as input and return the total weight of the first and last packages.

Input Format

The first line of the input is an integer N representing the size of the array.

The second line of the input is N space-separated integer values.

Output Format

The output is displayed in the following format:

"Sum of the first and last elements: <<Sum>>"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
10 20 30 40 50
Output: Sum of the first and last elements: 60

Answer

```
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int size = scanner.nextInt();
        int[] arr = new int[size];
        if (size < 2) {
            return;
        }
        for (int i = 0; i < size; i++) {
            arr[i] = scanner.nextInt();
        }
        int sum = arr[0] + arr[size - 1];
        System.out.println("Sum of the first and last elements: " + sum);
        scanner.close();
    }
}
```

Sample Test Case

Input: 3 3
1 2 3
4 5 6
7 8 9
1 1 1
2 2 2
3 3 3
Output: 2 3 4
6 7 8
10 11 12

Answer

```
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int a = scanner.nextInt();
        int b = scanner.nextInt();
        int[][] arr1 = new int[10][10];
        int[][] arr2 = new int[10][10];
        for (int i = 0; i < a; i++) {
            for (int j = 0; j < b; j++) {
                arr1[i][j] = scanner.nextInt();
            }
        }
        for (int i = 0; i < a; i++) {
            for (int j = 0; j < b; j++) {
                arr2[i][j] = scanner.nextInt();
```

```
            }
        }
        int[][] res = new int[a][b];

        for (int i = 0; i < a; i++) {
            for (int j = 0; j < b; j++) {
                res[i][j] = arr1[i][j] + arr2[i][j];
            }
        }
        for (int i = 0; i < a; i++) {
            for (int j = 0; j < b; j++) {
                System.out.print(res[i][j] + " ");
            }
            System.out.println();
        }
        scanner.close();
    }
}
```

Sharon is creating a program that finds the first repeated element in an integer array. The program should efficiently identify the first element that appears more than once in the given array. If no such element is found, it should appropriately display a message.

Help Sharon to complete the program.

Input Format

The first line of input consists of an integer n, representing the number of elements in the array.

The second line consists of n space-separated integers, representing the array elements.

Output Format

If a repeated element is found, print the first element that appears more than once.

If no repeated element is found, print "No repeated element found in the array".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 8
12 21 13 14 21 36 47 21
Output: 21

Answer

```
import java.util.Scanner;

class Main
{
  public static void main(String[] args)
  {
    Scanner scanner = new Scanner(System.in);
    int n = scanner.nextInt();
    int[] arr = new int[n];
    for (int i = 0; i < n; i++)
```

Output: 21

Answer

```
import java.util.Scanner;

class Main
{
   public static void main(String[] args)
   {
      Scanner scanner = new Scanner(System.in);
      int n = scanner.nextInt();
      int[] arr = new int[n];
      for (int i = 0; i < n; i++)
      {
         arr[i] = scanner.nextInt();
      }
      int one = -1;
      for (int i = 0; i < arr.length; i++)
      {
         for (int j = i + 1; j < arr.length; j++)
         {
            if (arr[i] == arr[j])
            {
               one = arr[i];
               break;
            }
         }
```

```
         if (one != -1)
         {
            break;
         }
      }
      if (one != -1)
      {
         System.out.println(one);
      }
      else
      {
         System.out.println("No repeated element found in the array");
      }
      scanner.close();
   }
}
```