Task 2: Array Manipulation

Given an array arr[], find the prefix sum of the array. A prefix sum array is another array prefixSum[] of the same size, such that prefixSum[i] is arr[0] + arr[1] + arr[2] ... arr[i].

Sample input - 1: 5

10 20 10 5 15

Sample Output - 1:

10 30 40 45 60

Explanation: for each index i, all the elements from 0 to i

Aim: To design and implement a Java program that takes an array of integers as input and computes its prefix sum Array where:

$$\text{PrefixSum}[i] = \sum_{j=0}^{i} arr[j]$$

Algorithm:

Step 1 : Start

Step 2 : Input the size of the array n.

Step 3 : Create an array arr of size n and take n integers as input.

Step 4 : Create a new array prefixSum of the same size.

Step 5 : Set the first element: prefixSum[0] = arr[0]

Step 6 : loop through the array from index i=1 to n

→ Calculate prefixSum[i] = prefixSum[i-1] + arr[i]

Step 7 : Print the elements of the prefixSum Array.

Step 8 : End.

Input Enter the array size : 5

Enter array elements

10 20 10 5 15

output

10 30 40 45 60

Prefix sum array

0 20 30 35 50

Program:

```
import java.util.Scanner;
Public class prefixSum{
Public static void main (string[]args){
   scanner sc=new  scanner(system.in);
System.out.print("Enter size of array:");
    int n= sc.nextInt();
    int []arr=new int[n];
    int[] prefix sum= new int[n];
System.out.println("Enter array elements:");
    for(int i=0;i<n;i++){
      arr[i]= sc.nextInt();
    }
   PrefixSum[i]= prefixSum[i-1] +arr[i]+arr[i]
    PrefixSum[0]= arr[0];
  for(int  i=1; i<n;i++){
    PrefixSum[i]= prefixSum[i-1]+ arr[i];
  }
  System.out.println("prefix sum Array:");
   for(int x:prefixSum){
    System.out.print(x+" ");
    }
     sc. close();
  }
  }
```

Result: Thus, the program is executed successfully.

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