S.No: 4	Exp. Name: ***Search for an element in a given list of elements using Binary Search.***	Date:2023-09-13

Aim:

Write a program to search for an element in a given list of elements using **Binary Search** mechanism.

Source Code:

q36414/BinarySearch.java

```
package q36414;
import java.util.*;
class BinarySearch
{
   public static void main(String args[])
   {
      Scanner s = new Scanner(System.in);
      int n,key,pos=-1,mid,low,high,i;
      System.out.print("Enter the number of elements: ");
      n=s.nextInt();
      System.out.println("Enter the sorted elements:");
      int a[] = new int[n];
      for(i=0;i<n;i++)
         a[i] = s.nextInt();
         low=0;
         high=n-1;
         System.out.print("Enter the element to search for: ");
         key = s.nextInt();
         pos = BinarySearchDemo.Bs(a,n,low,high,key);
         if(pos==-1)
         {
            System.out.println("Element "+key+" not found in the list.");
         }
         else
         {
            System.out.println("Element "+key+" found at index "+pos);
         }
      }
}
class BinarySearchDemo
{
   public static int Bs(int a[],int n,int low,int high,int key)
   {
      int mid;
      while(low<=high)
      {
         mid=(low+high)/2;
         if(a[mid]<key)
         {
            low=mid+1;
         }
         if(a[mid]>key)
         {
            high=mid-1;
         }
```

```
            if(a[mid]==key)
            {
               return mid;
            }
         }
         return -1;
      }
   }
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter the number of elements: 5
Enter the sorted elements: 10 20 30 40 50
Enter the element to search for: 30
Element 30 found at index 2

Test Case - 2
User Output
Enter the number of elements: 8
Enter the sorted elements: 2 4 6 8 10 12 14 16
Enter the element to search for: 9
Element 9 not found in the list.

ID: 22K61A4234

Sasi Institute of Technology and Engineering (Autonomous)