Aim:

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

Source Code:

q36414/BinarySearch.java

```java
package q36414;
import java.util.*;
class BinarySearchDemo
{
    public static int Bs(int high,int key,int a[],int low)
    {
        int mid;
        while(low<=high)
        {
            mid=(low+high)/2;
            if(a[mid]==key)
            {
                return mid;
            }
            else if(a[mid]<key)
            {
                low=mid+1;
            }
            else
            {
                high=mid-1;
            }
        }
        return -1;
    }
}
class BinarySearch
{
    public static void main(String args[])
    {
        Scanner s=new Scanner(System.in);
        int i,n,low,high,key,pos=-1;
        System.out.print("Enter the number of elements: ");
        n=s.nextInt();
        int a[]=new int[n];
        System.out.println("Enter the sorted elements:");
        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(high,key,a,low);
```

```
        if(pos==-1)
        {
            System.out.println("Element "+key+" not found in the list.");
        }
        else
        {
            System.out.println("Element "+key+" found at index "+pos);
        }
    }
}
```

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.