Assignment 3: Binary search on given set of values and search key

```java
1   import java.util.Scanner;
2
3   public class BinarySearch {
4
5       public static void main(String[] args) {
6           Scanner scanner = new Scanner(System.in);
7
8           System.out.print("Enter the number of elements in the sorted array: ");
9           int n = scanner.nextInt();
10          int[] sortedArray = new int[n];
11
12          System.out.println("Enter the sorted array elements:");
13          for (int i = 0; i < n; i++) {
14              sortedArray[i] = scanner.nextInt();
15          }
16
17          System.out.print("Enter the element to search for: ");
18          int searchKey = scanner.nextInt();
19
20          int result = binarySearch(sortedArray, searchKey);
21
22          if (result != -1) {
23              System.out.println("Element found at index " + result);
24          } else {
25              System.out.println("Element not found in the array.");
26          }
27
28          scanner.close();
29      }
30
31      static int binarySearch(int[] arr, int target) {
32          int left = 0;
33          int right = arr.length - 1;
34
35          while (left <= right) {
36              int mid = left + (right - left) / 2;
37
38              if (arr[mid] == target) {
39                  return mid;
40              } else if (arr[mid] < target) {
41                  left = mid + 1;
42              } else {
43                  right = mid - 1;
44              }
45          }
46
47          return -1;
48      }
49  }
```

Output:

```
Enter the number of elements in the sorted array: 3
Enter the sorted array elements:
100 300 200
Enter the element to search for: 300
Element found at index 1
```