

## PHASE 1 PRACTICE ASSISTED PROJECT

### 2. Writing a program in Java implementing the binary search algorithm

```
3. package main;
4.
5. public class BinarySearch {
6.
7.     public static int binarySearch(int[] arr, int target) {
8.         int left = 0;
9.         int right = arr.length - 1;
10.
11.         while (left <= right) {
12.             int mid = left + (right - left) / 2;
13.
14.             if (arr[mid] == target) {
15.                 return mid; // Target found
16.             } else if (arr[mid] < target) {
17.                 left = mid + 1; // Search in the right
18.                 half
19.             } else {
20.                 right = mid - 1; // Search in the left
21.                 half
22.             }
23.         }
24.         return -1; // Target not found
25.     }
26.
27.     public static void main(String[] args) {
28.         int[] arr = {2, 5, 8, 12, 16, 23, 38, 56, 72, 91};
29.         int target = 23;
30.
31.         int index = binarySearch(arr, target);
32.
33.         if (index != -1) {
34.             System.out.println("Target found at index: "
35. + index);
36.         } else {
37.             System.out.println("Target not found in the
38. array.");
39.         }
40.     }
41. }
```

OUTPUT-

```
Console ×
<terminated> BinarySearch [Java Application] C:\Program Files\Java\jdk-20\bin\javaw.exe (18-May-2023, 9:51:26 am – 9:51:26 am) [pid: 22996]
Target found at index: 5
```