

SEM 3\Exp7\Bin_Search.c

```
1  #include <stdio.h>
2
3  // Function to perform binary search
4  int binarySearch(int arr[], int size, int key)
5  {
6      int left = 0;
7      int right = size - 1;
8
9      while (left <= right)
10     {
11         int mid = left + (right - left) / 2;
12
13         if (arr[mid] == key)
14         {
15             return mid; // Return the index of the found element
16         }
17         if (arr[mid] < key)
18         {
19             left = mid + 1; // Search in the right half
20         }
21         else
22         {
23             right = mid - 1; // Search in the left half
24         }
25     }
26     return -1; // Return -1 if the element is not found
27 }
28
29 int main()
30 {
31     int arr[] = { 1, 3, 5, 7, 9, 11, 13, 15, 17, 19}; // Note: Array must be sorted
32     for binary search
33     int size = sizeof(arr) / sizeof(arr[0]);
34     int key;
35
36     printf("Enter the element to search for (Binary Search): ");
37     scanf("%d", &key);
38
39     int index = binarySearch(arr, size, key);
40     if (index != -1)
41     {
42         printf("Element %d found at index %d.\n", key, index);
43     }
44     else
45     {
46         printf("Element %d not found in the array.\n", key);
47     }
48     return 0;
49 }
50
```