Aim

To write a C program to search for a number using binary search.

Algorithm

- 1. Start program.
- 2. Input sorted array and target.
- 3. Initialize low=0, high=n-1.
- 4. While low <= high:</pre>

```
○ Find mid = (low+high)/2.
```

- o If arr[mid] == key, print found.
- o If arr[mid] < key, set low = mid+1.</pre>
- Else high = mid-1.
- 5. If not found, print not found.

Code

```
#include <stdio.h>
int main() {
   int n, i, key, low, high, mid;
   printf("Enter size of sorted array: ");
   scanf("%d", &n);
   int arr[n];
   printf("Enter sorted elements:\n");
   for (i = 0; i < n; i++)
       scanf("%d", &arr[i]);</pre>
```

```
printf("Enter element to search: ");
    scanf("%d", &key);
    low = 0;
    high = n-1;
    while (low <= high) {</pre>
        mid = (low + high) / 2;
        if (arr[mid] == key) {
            printf("Element found at position %d\n", mid+1);
            return 0;
        } else if (arr[mid] < key)</pre>
            low = mid + 1;
        else
            high = mid - 1;
    printf("Element not found\n");
    return 0;
}
```

Sample Output

```
Enter size of array: 4
Enter elements:
1 2 3 4
Enter element to search: 2
Element found at position 2
```

Result

Binary search successfully finds elements in sorted arrays.