

Fast and Last Index in C++

```
#include <iostream>
using namespace std;

void findFirstAndLastIndex(int arr[], int n,
int d) {
    int low = 0;
    int high = n - 1;
    int firstIndex = -1;
    int lastIndex = -1;

    // Finding the first occurrence
    while (low <= high) {
        int mid = low + (high - low) / 2;
        if (d > arr[mid]) {
            low = mid + 1;
        } else if (d < arr[mid]) {
            high = mid - 1;
        } else {
            firstIndex = mid;
            high = mid - 1;
        }
    }

    // Finding the last occurrence
    low = 0;
    high = n - 1;
    while (low <= high) {
        int mid = low + (high - low) / 2;
        if (d > arr[mid]) {
            low = mid + 1;
        } else if (d < arr[mid]) {
            high = mid - 1;
        } else {
            lastIndex = mid;
            low = mid + 1;
        }
    }

    cout << "First Index: " << firstIndex <<
endl;
    cout << "Last Index: " << lastIndex <<
endl;
}

int main() {
    int arr[] = {1, 5, 10, 15, 22, 33, 33, 33, 33,
33, 40, 42, 55, 66, 77, 33};
    int n = sizeof(arr) / sizeof(arr[0]);
    int d = 33;

    findFirstAndLastIndex(arr, n, d);

    return 0;
}
```

Dry Run Example (on sorted array):

Sorted version of the array:

{1, 5, 10, 15, 22, 33, 33, 33, 33, 33, 40, 42, 55, 66, 77}

We want to find **first and last index of 33**.

First Occurrence:

Iteration	low	high	mid	arr[mid]	firstIndex	high (updated)
1	0	15	7	33	7	6
2	0	6	3	15		
3	4	6	5	33	5	4
4	4	4	4	22		

→ First index = **5**

Last Occurrence:

Iteration	low	high	mid	arr[mid]	lastIndex	low (updated)
1	0	15	7	33	7	8
2	8	15	11	40		
3	8	10	9	33	9	10
4	10	10	10	33	10	11

→ Last index = **10**

📦 Final Output:

First Index: 5
Last Index: 10

First Index: 5 Last Index: 10	