```cpp
#include <iostream>

using namespace std;

int binarySearch(int arr[], int size, int target) {
    int low = 0;
    int high = size - 1;

    while (low <= high) {
        int mid = low + (high - low) / 2;
        if (arr[mid] == target) {
            return mid;
        } else if (arr[mid] < target) {
            low = mid + 1;
        } else {
            high = mid - 1;
        }
    }
    return -1;
}

int main() {
    int arr[] = {1, 2, 3, 4, 5, 6, 7, 8, 9};
    int size = sizeof(arr) / sizeof(arr[0]);
    int target = 5;
    int result = binarySearch(arr, size, target);
    if (result == -1) {
        cout << "value not found" << endl;
    } else {
        cout << "value found at index: " << result << endl;
    }
    return 0;
}
```