

Find Rotation Count in C++

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

int
findRotationCount(vector<int>
t& arr) {
    int lo = 0;
    int hi = arr.size() - 1;

    // If the array is not
    rotated, return 0
    if (arr[lo] <= arr[hi]) {
        return 0;
    }

    while (lo <= hi) {
        int mid = lo + (hi - lo) /
2;

        // Check if mid is the
        pivot element
        if (mid < hi &&
arr[mid] > arr[mid + 1]) {
            return mid + 1;
        }
        // Check if mid-1 is the
        pivot element
        else if (mid > lo &&
arr[mid] < arr[mid - 1]) {
            return mid;
        }
        // If arr[lo] <= arr[mid],
        it means the left half is
        sorted, so pivot is in the
        right half
        else if (arr[lo] <=
arr[mid]) {
            lo = mid + 1;
        }
        // Otherwise, pivot is in
        the left half
        else {
            hi = mid - 1;
        }
    }

    return 0; // Should not
    reach here in a rotated
    sorted array scenario
}

int main() {
    // Hardcoded input
    vector<int> arr = {4, 5, 6,
7, 8, 0, 1, 2};

    // Call the
    findRotationCount function
    to find the rotation count
    int ans =
```

Input:

vector<int> arr = {4, 5, 6, 7, 8, 0, 1, 2};

This is a sorted array rotated **5 times**. Let's trace it step-by-step.

Initial Setup:

- lo = 0, hi = 7
- Condition: If arr[lo] <= arr[hi], return 0 — not true here (4 > 2)

🔍 Detailed Step-by-Step Table:

Step	lo	hi	mid	arr[mid]	arr[mid+1]	arr[mid-1]	Condition Met	Explanation & Action
1	0	7	$(0+7)/2 = 3$	7	8	6	arr[lo] <= arr[mid] → 4 <= 7	Left half is sorted → move right: lo = mid + 1 = 4
2	4	7	$(4+7)/2 = 5$	0	1	8	arr[mid] < arr[mid-1] → 0 < 8 ✓	Pivot found → return mid = 5

✓ Final Output:

5

<pre>findRotationCount(arr); // Print the rotation count cout << ans << endl; return 0; }</pre>	
5	