public int count(int[] arr, int target) {

int left = binarySearch(arr, target, true);

if (left < 0) return 0;

int right = binarySearch(arr, target, false);

return right - left + 1;

}

private int binarySearch(int[] arr, int target, boolean leftmost) {

int lo = 0;

int hi = arr.length - 1;

int idx = -1;

while (lo <= hi) {

int mid = (lo + hi) >>> 1; // avoid overflow. same as (lo + hi) / 2

if (target > arr[mid]) {

lo = mid + 1;

} else if (target < arr[mid]) {

hi = mid - 1;

} else {

idx = mid;

if (leftmost) {

hi = mid - 1;

} else {

lo = mid + 1;

}

}

}

return idx;

}