

Binary Search

Time: $O(n \log n)$

Space: $O(1)$

Approach 1: Return the match inside the loop

```
public int search(int[] nums, int target) {
    int low = 0;
    int high = nums.length - 1;
    while (low <= high) {
        int mid = low + (high - low) / 2;
        if (nums[mid] == target)
            return mid;
        else if (nums[mid] > target)
            high = mid - 1;
        else
            low = mid + 1;
    }
    return -1;
}
```

Approach 2: Exit out of the loop and use `low` to return the match

```
public int search(int[] nums, int target) {
    int low = 0;
    int high = nums.length - 1;
    while (low < high) {
        int mid = low + (high - low) / 2;
        if (nums[mid] > target)
            high = mid;
        else
            low = mid + 1;
    }
    return low;
}
```