RAJALAKSHMI ENGINEERING COLLEGE

POOJASHREE S 2024-AIDS

P2

Started on	Wednesday, 8 October 2025, 9:29 PM
State	Finished
Completed on	Wednesday, 8 October 2025, 9:32 PM
Time taken	3 mins 19 secs
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question 1 | Correct Mark 1.00 out of 1.00

Problem Statement

Given an array of 1s and 0s this has all 1s first followed by all 0s. Aim is to find the number of 0s. Write a program using Divide and Conquer to Count the number of zeroes in the given array.

Input Format

First Line Contains Integer m – Size of array

Next m lines Contains m numbers – Elements of an array

Output Format

First Line Contains Integer – Number of zeroes present in the given array.

Answer: (penalty regime: 0 %)

```c
#include <stdio.h>

int firstZero(int arr[], int low, int high) {
    if (high >= low) {
        int mid = low + (high - low) / 2;

        if ((mid == 0 || arr[mid - 1] == 1) && arr[mid] == 0) {
            return mid;
        }

        if (arr[mid] == 1) {
            return firstZero(arr, mid + 1, high);
        }

        else {
            return firstZero(arr, low, mid - 1);
        }
    }
    return -1;
}

int countZeroes(int arr[], int m) {
    int idx = firstZero(arr, 0, m - 1);
    if (idx == -1) {
        return 0;
    }
    return m - idx;
}

int main() {
    int m;
    if (scanf("%d", &m) != 1) {
        return 0;
    }
    int arr[m];
    for (int i = 0; i < m; i++) {
        scanf("%d", &arr[i]);
    }
    int result = countZeroes(arr, m);
    printf("%d\n", result);
    return 0;
}
```

	Input	Expected	Got	
✔	5 1 1 1 0 0	2	2	✔
✔	10 1 1 1 1 1 1 1 1 1 1	0	0	✔
✔	8 0 0 0 0 0 0 0 0	8	8	✔
✔	17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0	2	2	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

Back to Course

RAJALAKSHMI ENGINEERING COLLEGE

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P2

Started on	Wednesday, 8 October 2025, 9:33 PM
State	Finished
Completed on	Wednesday, 8 October 2025, 9:37 PM
Time taken	4 mins 22 secs
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question 1 | Correct Mark 1.00 out of 1.00

Given an array `nums` of size `n`, return *the majority element*.

The majority element is the element that appears more than `⌊n / 2⌋` times. You may assume that the majority element always exists in the array.

Example 1:

```
Input: nums = [3,2,3]
Output: 3
```

Example 2:

```
Input: nums = [2,2,1,1,1,2,2]
Output: 2
```

Constraints:

- `n == nums.length`
- `1 <= n <= 5 * 10^4`
- `-2^31 <= nums[i] <= 2^31 - 1`

For example:

Input	Result
3 3 2 3	3
7 2 2 1 1 1 2 2	2

Answer: (penalty regime: 0 %)

```c
#include <stdio.h>

int majorityElement(int arr[], int n) {

    int candidate = arr[0];
    int count = 1;
    for (int i = 1; i < n; i++) {
        if (arr[i] == candidate) {
            count++;
        } else {
            count--;
            if (count == 0) {
                candidate = arr[i];
                count = 1;
            }
        }
    }


    int freq = 0;
    for (int i = 0; i < n; i++) {
        if (arr[i] == candidate) {
            freq++;
        }
    }
    if (freq > n / 2) {
```

```
        return candidate;
    }

    return -1;
}

int main() {
    int n;
    if (scanf("%d", &n) != 1) {
        return 0;
    }
    int arr[n];
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    int result = majorityElement(arr, n);
    printf("%d\n", result);
    return 0;
}
```

	Input	Expected	Got	
✔	3 3 2 3	3	3	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

Back to Course

RAJALAKSHMI ENGINEERING COLLEGE

POOJASHREE S 2024-AIDS

P2

Started on	Wednesday, 8 October 2025, 9:38 PM
State	Finished
Completed on	Wednesday, 8 October 2025, 9:40 PM
Time taken	2 mins 34 secs
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question 1 | Correct Mark 1.00 out of 1.00

Problem Statement:

Given a sorted array and a value x, the floor of x is the largest element in array smaller than or equal to x. Write divide and conquer algorithm to find floor of x.

Input Format

First Line Contains Integer n – Size of array

Next n lines Contains n numbers – Elements of an array

Last Line Contains Integer x – Value for x

Output Format

First Line Contains Integer – Floor value for x

Answer: (penalty regime: 0 %)

```c
#include <stdio.h>

int findFloor(int arr[], int n, int x) {
    int low = 0, high = n - 1;
    int floorIdx = -1;

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

    if (floorIdx == -1) {

        return -1;
    }
    return arr[floorIdx];
}

int main() {
    int n;
    if (scanf("%d", &n) != 1) {
        return 0;
    }
    int arr[n];
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    int x;
    scanf("%d", &x);

    int floorValue = findFloor(arr, n, x);
    printf("%d\n", floorValue);
    return 0;
}

```

	Input	Expected	Got	
✔	6 1 2 8 10 12 19 5	2	2	✔
✔	5 10 22 85 108 129 100	85	85	✔
✔	7 3 5 7 9 11 13 15 10	9	9	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

Back to Course

RAJALAKSHMI ENGINEERING COLLEGE

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P2

Started on	Wednesday, 8 October 2025, 9:43 PM
State	Finished
Completed on	Wednesday, 8 October 2025, 9:50 PM
Time taken	6 mins 33 secs
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question 1 | Correct Mark 1.00 out of 1.00

Write a Program to Implement the Quick Sort Algorithm

Input Format:
The first line contains the no of elements in the list-n
The next n lines contain the elements.

Output:
Sorted list of elements

For example:

Input	Result
5 67 34 12 98 78	12 34 67 78 98

Answer:

```c
#include <stdio.h>

void swap(int *a, int *b) {
    int t = *a;
    *a = *b;
    *b = t;
}


int partition(int arr[], int low, int high) {
    int pivot = arr[high];
    int i = low - 1;

    for (int j = low; j < high; j++) {
        if (arr[j] <= pivot) {
            i++;
            swap(&arr[i], &arr[j]);
        }
    }
    swap(&arr[i + 1], &arr[high]);
    return (i + 1);
}

void quickSort(int arr[], int low, int high) {
    if (low < high) {
        int pi = partition(arr, low, high);

        quickSort(arr, low, pi - 1);
        quickSort(arr, pi + 1, high);
    }
}

int main() {
    int n;
    scanf("%d", &n);
    int arr[n];
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }

    quickSort(arr, 0, n - 1);

    for (int i = 0; i < n; i++) {
        printf("%d", arr[i]);
        if (i < n - 1) printf(" ");
    }
```

```
47      printf("\n");
48
49      return 0;
50  }
51
```

	Input	Expected	Got	
✔	5 67 34 12 98 78	12 34 67 78 98	12 34 67 78 98	✔
✔	10 1 56 78 90 32 56 11 10 90 114	1 10 11 32 56 56 78 90 90 114	1 10 11 32 56 56 78 90 90 114	✔
✔	12 9 8 7 6 5 4 3 2 1 10 11 90	1 2 3 4 5 6 7 8 9 10 11 90	1 2 3 4 5 6 7 8 9 10 11 90	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

Back to Course

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Answer:

```c
#include <stdio.h>

void swap(int *a, int *b) {
    int t = *a;
    *a = *b;
    *b = t;
}


int partition(int arr[], int low, int high) {
    int pivot = arr[high];
    int i = low - 1;

    for (int j = low; j < high; j++) {
        if (arr[j] <= pivot) {
            i++;
            swap(&arr[i], &arr[j]);
        }
    }
    swap(&arr[i + 1], &arr[high]);
    return (i + 1);
}

void quickSort(int arr[], int low, int high) {
    if (low < high) {
        int pi = partition(arr, low, high);

        quickSort(arr, low, pi - 1);
        quickSort(arr, pi + 1, high);
    }
}

int main() {
    int n;
    scanf("%d", &n);
    int arr[n];
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }

    quickSort(arr, 0, n - 1);

    for (int i = 0; i < n; i++) {
        printf("%d", arr[i]);
        if (i < n - 1) printf(" ");
    }
```

```
47      printf("\n");
48
49      return 0;
50  }
51
```

	Input	Expected	Got	
✔	5 67 34 12 98 78	12 34 67 78 98	12 34 67 78 98	✔
✔	10 1 56 78 90 32 56 11 10 90 114	1 10 11 32 56 56 78 90 90 114	1 10 11 32 56 56 78 90 90 114	✔
✔	12 9 8 7 6 5 4 3 2 1 10 11 90	1 2 3 4 5 6 7 8 9 10 11 90	1 2 3 4 5 6 7 8 9 10 11 90	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

Back to Course