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EXP 2 DIVIDE AND CONQUER

1)

```
#include <stdio.h>

// Function to count zeros using binary search
int countZeros(int arr[], int low, int high, int size) {
    if (high >= low) {
        int mid = low + (high - low) / 2;

        // Check if mid is the first occurrence of 0
        if ((mid == 0 || arr[mid - 1] == 1) && arr[mid] == 0) {
            return size - mid;
        }
        // Move to the right half if current element is 1
        else if (arr[mid] == 1) {
            return countZeros(arr, mid + 1, high, size);
        }
        // Move to the left half
        else {
            return countZeros(arr, low, mid - 1, size);
        }
    }
    return 0; // No zeros found
}

int main() {
    int m;
    scanf("%d", &m);
    int arr[m];

    // Input array elements
    for (int i = 0; i < m; i++) {
        scanf("%d", &arr[i]);
    }

    int result = countZeros(arr, 0, m - 1, m);
    printf("%d\n", result);
```

```
    return 0;
}
```

2)

```
#include<stdio.h>

int main(){
   int n;
   scanf("%d",&n);
   int a[n];
   int c=0;
   for(int i=0;i<n;i++){
      scanf("%d",&a[i]);
   }
   int max=a[0];
   for(int i=0;i<n;i++){
      for(int j=i+1;j<n;j++){
          if(a[i]==a[j]){
              c++;
          }
      }
      if(c>=(n/2)){
         max=a[i];
      }
    }
    printf("%d",max);
}
```

3)

```
#include <stdio.h>
int findFloor(int arr[], int l, int h, int x) {
    int f = -1;

    while (l <= h) {
        int m = l + (h - l) / 2;

        if (arr[m] == x) {
            return arr[m];
        } else if (arr[m] < x) {
            f = arr[m];
```

```
            l = m + 1;
        } else {
            h = m - 1;
        }
    }
    return f;
}

int main() {
    int n;
    scanf("%d", &n);
    int arr[n];


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

    int x;
    scanf("%d", &x);

    int ans = findFloor(arr, 0, n - 1, x);
    printf("%d\n", ans);

    return 0;
}
```

4)

```
#include<stdio.h>
#include<stdlib.h>
int main(){
    int n;
    scanf("%d",&n);
    int arr[n];
    for(int i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }
    int x;
    scanf("%d",&x);
    int f=0;
    for(int i=0;i<n;i++){
        for(int j=i+1;j<n;j++){
            if(arr[i]+arr[j]==x){
```

```
                f=1;
                printf("%d\n",arr[i]);
                printf("%d",arr[j]);
            }

        }
    }
    if(f==0){
        printf("No");
    }
    return 0;
}
```

5)

```
#include<stdio.h>
#include<stdlib.h>

int comp(const void* a,const void* b){
    return (*(int*)a-*(int*)b);
}

int main(){
    int n;
    scanf("%d",&n);

    int arr[n];

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

    qsort(arr,n,sizeof(int),comp);
    for(int i=0;i<n;i++){
        printf("%d ",arr[i]);
    }
    return 0;
}
```