ROLL NO:230701036

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TOPIC: DIVIDE AND CONQUER

1-Number of Zeros in a Given Array

AIM:

Write a program using Divide and Conquer to Count the number of zeroes in the given array.

CODE:

```
#include<stdio.h>
int main()
{
   int n;
   scanf("%d",&n);
   int a[n],cnt=0;
   for(int i=0;i<n;i++)
   {
      scanf("%d",&a[i]);
      if(a[i]==0)
        cnt++;
   }
   printf("%d",cnt);
}
```

INPUT:

First Line Contains Integer m – Size of array
Next m lines Contains m numbers – Elements of an array

OUTPUT:

	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	✔

2-Majority Element

AIM:

Write a program to return the majority element in a array .

CODE:

```
#include<stdio.h>
int main()
{
   int n;
   scanf("%d",&n);
   int a[n],b[n],cnt=0;
   for(int i=0;i<n;i++){
    scanf("%d",&a[i]);
    b[i]=0;}
   for(int i=0;i<n;i++)
      for(int j=0;j<n;j++)
         if(a[i]==a[j])
           b[j]+=1;
   cnt=a[0] ;
   for(int i=0;i<n-1;i++)
    if(b[i]<b[i+1])
      cnt=a[i+1];
   printf("%d",cnt)   ;
}
```

INPUT:

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

OUTPUT:

	Input	Expected	Got	
✔	3 3 2 3	3	3	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

3-Finding Floor Value

AIM:

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.

CODE:

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

}
```

INPUT:

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:

	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

4-Two Elements sum to x

AIM:

Write a recursive program using divide and conquer strategy to check if there exist two elements in the array whose sum = x. If there exist such two elements then return the numbers, otherwise print as “No”.

INPUT:

First Line Contains Integer n – Size of array
Next n lines Contains n numbers – Elements of an array
Last Line Contains Integer x – Sum Value

CODE:

```
#include<stdio.h>
int main(){
   int n,cnt=0;
   scanf("%d",&n);
   int a[n],b;
   for(int i=0;i<n;i++)
     scanf("%d",&a[i]);
   scanf("%d",&b);
   for(int i=0;i<n;i++)
    for(int j=0;j<n;j++){
      if(a[i]+a[j]==b){
        printf("%d\n%d",a[i],a[j]);
        cnt=1;
      }
      if(cnt==1)
          break;
    }
```

```
  if(cnt==0)
   printf("No");
}
```

OUTPUT:

	Input	Expected	Got	
✔	4 2 4 8 10 14	4 10	4 10	✔
✔	5 2 4 6 8 10 100	No	No	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

5-Implementation of Quick Sort

AIM:

Write a Program to Implement the Quick Sort Algorithm

INPUT:

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

CODE:

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

OUTPUT:

	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
✔	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