CS263 LAB2

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Task: Write a code to find the majority element of the array using divide and conquer process

Solution Code:

```java
import java.util.*;
public class Getmajority {
    public static void MJElement(int A[],int n){
        int r1=0;                   //variable to count elements < pivot element
        int r2=0;                   //variable to count for elements == pivot element
        int r3=0;                   //variable to count for elements >pivot element
        int pvt =A[0];              // assuming 1st element of array as pivot element
        for(int i=0; i<n; i++){
            if(A[i]==pvt){
                r1++;               //r1 increase when element < pivot
            }
            else if(A[i]>pvt){
                r2++;               //r2 increase when element ==pivot
            }
            else{
                r3++;               //r3 increase when element > pivot
            }
        }
        if(r1>=n/2){
            System.out.println("Majority is "+pvt);        //introducing base case
                return;
        }
        else if(r2>n/2){
          int M[] = new int[r2];
          int j=0;
          for(int i =0; i<n; i++){
            if(A[i]>pvt){
                M[j] = A[i];
                j++;
            }
          }
          MJElement(M,r2);                  //recursive call
        }
```

```java
    else if(r3>n/2){
    int N[] = new int[r2];
    int j=0;
    for(int i =0; i<n; i++){
       if(A[i]>pvt){
          N[j] = A[i];
          j++;
       }
    }
    MJElement(N,r3);                        //recursive call
}
    else{
       System.out.println(x: "Major element not available");
    }

}

Run | Debug
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);                //using scanner class for taking input
    int S,i;
    System.out.println(x: "Enter the size of array ");
    S=sc.nextInt();                                  //taking input of size of the array

    int a[] = new int[S];
    for(i=0;i<S;i++){
       a[i]=sc.nextInt();                            //scanning and input of elements in the array
    }

    MJElement(a, S);                                 //calling the function to get element in majority

}
```

Output:

```
PS D:\Java\ALCS263> cd "d:\Java\ALCS263\" ; if ($?) { javac Getmajority.java } ; if ($?) { java Getmajority }
Enter the size of array
7
2 12 2 2 4 5 2
Majority is 2
```