11.DIVIDE AND CONQUER

#include <stdio.h>

struct MinMax

{

int min;

int max;

int comparisons;

};

struct MinMax findMinMax(int arr[],int left,int right)

{

struct MinMax result,leftResult,rightResult;

int mid;

result.comparisons=0;

if (left==right)

{

result.min = result.max=arr[left];

return result;

}

if(right==left+1)

{

result.min=(arr[left]<arr[right])?arr[left]:arr[right];

result.max=(arr[left]>arr[right])?arr[left]:arr[right];

result.comparisons++;

return result;

}

mid=(left+right)/2;

leftResult=findMinMax(arr,left,mid);

rightResult=findMinMax(arr,mid+1,right);

result.comparisons+=leftResult.comparisons+rightResult.comparisons;

result.min=(leftResult.min<rightResult.min)?leftResult.min:rightResult.min;

result.max=(leftResult.max>rightResult.max)?leftResult.max:rightResult.max;

return result;

}

int main()

{

int n;

printf("Enter the number of elements: ");

scanf("%d",&n);

if(n<=0)

{

printf("Illegal input.\n");

return 1;

}

int arr[n];

printf("Enter the elements:\n");

for (int i=0;i<n;i++)

{

scanf("%d", &arr[i]);

}

struct MinMax result = findMinMax(arr, 0, n - 1);

printf("Min value: %d\n", result.min);

printf("Max value: %d\n", result.max);

printf("Number of comparisons: %d\n", result.comparisons);

return 0;

}

OUTPUT

