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Branch: CSE

Semester: 3rd

Subject Name: Design and Analysis of algorithms lab

UID: 19BCS4520

Section/Group: IOT-1 (group-A)

Date of Performance: 7/08/2020

Subject Code: CSP-240

1.Aim/Overview of the Practical: Find the Minimum and Maximum element in an array with Divide and conquer.

2.Task to be done:

```
#include <iostream>
#include <climits>
using namespace std;
void findMinAndMax(int arr [], int low, int high, int& min, int& max)
{
    if (low == high)
    {
        if (max < arr[low])
            max = arr[low];
        if (min > arr[high])
            min = arr[high];
        return;
    }
    if (high - low == 1)
    {
        if (arr[low] < arr[high])
        {
            if (min > arr[low])
                min = arr[low];
            if (max < arr[high])
                max = arr[high];
        }
    }
}
```



```
else
{
if (min > arr[high])
min = arr[high];
if (max < arr[low])
max = arr[low];
}
return;
}
int mid = (low + high) / 2;
findMinAndMax(arr, low, mid, min, max);
findMinAndMax(arr, mid + 1, high, min, max);
}
int main ()
{
int arr[] = {14,41,52,89,235,4,1,85,50001,425,458};
int n = sizeof(arr) / sizeof(arr[0]);
int max = INT_MIN, min = INT_MAX;
findMinAndMax(arr, 0, n - 1, min, max);
cout << "The minimum element " << min << '\n';
cout << "The maximum element " << max;
return 0;
}
```

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<https://min-and-max-by-div-and-con.parikshitsharm1.repl.run>

```
> clang++-7 -pthread -std=c++17 -o main main.cpp
> ./main
The minimum element 1
The maximum element 50001> █
```

3.Algorithm/flowchart:

Algorithm: Max-Min (number)

```
mim: = numbers [1]
min:= numbers[1]
for i = 2 to n do
    if numbers[i] > max then
        max: = numbers[i]
    if numbers[i] < min then
        min: = numbers[i]
return (max, min)
```

6.Percentage error (if any or applicable): zero

Result/outcome:

The minimum element in the array is 1

The maximum element in the array is 9

Learning outcomes (What I have learnt):

- 1.i learnt how to find minimum and maximum using divide and conquer.
- 2.I understand the execution of c programming.
- 3.i have learned the importance of algorithm.
- 4.i understood the max and min problems.
- 5.i learnt how to perform the arrays in max and min clearly.



Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			