Assignment 5

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#include <iostream>
#include <climits>
using namespace std;

// A structure to store both min and max of an array
struct MinMax {
    int min;
    int max;
};

// Function to find min and max using divide and conquer
MinMax findMinMax(int arr[], int low, int high) {
    MinMax result, leftResult, rightResult;

    // If the array contains only one element
    if (low == high) {
        result.min = result.max = arr[low];
        return result;
    }

    // If the array contains two elements
    if (high == low + 1) {
        if (arr[low] > arr[high]) {
            result.max = arr[low];
            result.min = arr[high];
        } else {
            result.max = arr[high];
            result.min = arr[low];
        }
        return result;
```

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    }

    // If the array contains more than two elements, divide the array
    int mid = (low + high) / 2;
    leftResult = findMinMax(arr, low, mid);
    rightResult = findMinMax(arr, mid + 1, high);

    // Compare the results of left and right subarrays
    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;

    // Take the size of the array as input
    cout << "Enter the number of elements in the array: ";
    cin >> n;

    int arr[n];

    // Take array elements as input
    cout << "Enter the elements of the array: ";
    for (int i = 0; i < n; i++) {
        cin >> arr[i];
    }

    // Call the function to find min and max
    MinMax result = findMinMax(arr, 0, n - 1);
```

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    // Output the result
    cout << "Minimum element: " << result.min << endl;
    cout << "Maximum element: " << result.max << endl;

    return 0;
}
```

Output: