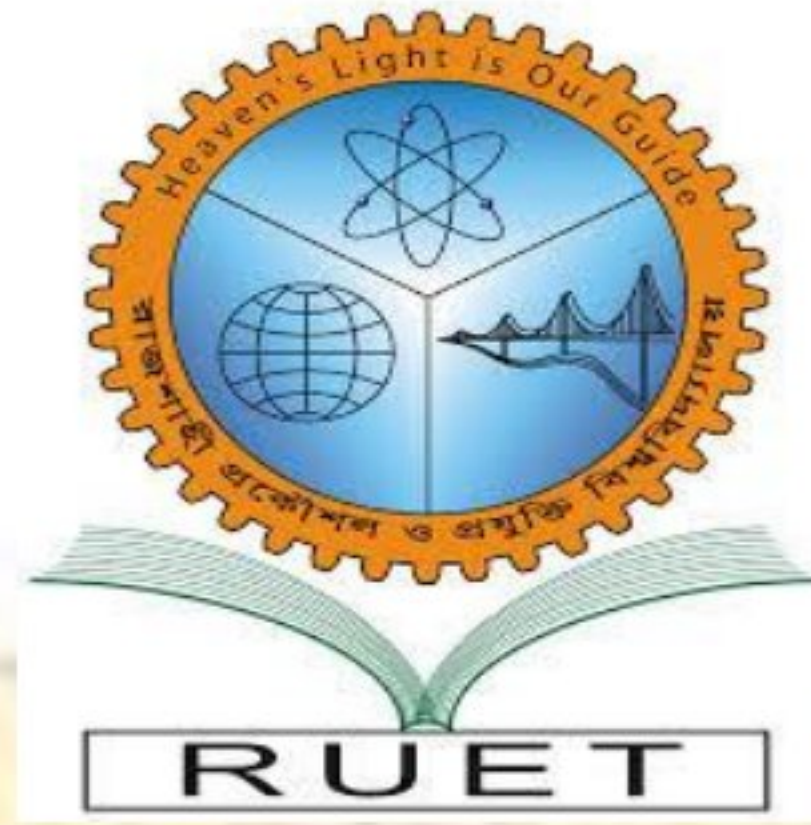


Heaven's Light is Our Guide



Rajshahi University of Engineering and Technology

Department of Computer Science and Engineering

Course No: CSE.2202

Course Title: Sessional based on CSE.2201 (Computer Algorithms)

Report On: Lab Final Problem 2

Submitted To

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Problem 2:

Algorithm:

```
① Mangedont (low, high) {  
    if (low < high) {  
        mid := ⌊ (low + high) / 2 ⌋;  
        Mangedont (low, mid);  
        Mangedont (mid + 1, high);  
        Mangedont (low, mid, high);  
    }  
}
```

```
② Mangedont (low, mid, high) {  
    i := low; j := high;  
    while (i ≤ mid) and (j ≤ high) do {  
        if (a[i] ≤ a[j]) then {  
            b[i] := a[i]; i := i + 1;  
        } else { b[i] = a[j]; j := j + 1; }  
        i := i + 1;  
    }  
    if (i > mid) then
```



```

for k := l to high do {
    b[i] = a[k]; i = i + 1; }
else { for k := h to mid do {
    b[i] = a[k]; i = i + 1; }
}
for k = low to high do a[k] = b[k];
}

```

Code :

```

#include <bits/stdc++.h>
using namespace std;
using namespace std::chrono;
typedef long long ll;

```

```

vector<ll> arr1;
ll arr2[100000], n;

```

```

void input (ll n, ll i) {
    string a, b = "mange";
    b = b + to_string(i) + ".txt";
    ifstream f1;
}

```



```

f1.open(b);
arr1.clean();
while (arr1.size() < n) {
    f1 >> a;
    arr1.push_back(stod(a));
}
f1.close();

```

```

}
void merge (ll low, ll mid, ll high) {
    ll h=low, i=low, j=high;

```

```

    while ( h <= mid && j <= high) {
        if (arr1[h] <= arr1[j]) {
            arr2[i] = arr1[h];
            h++;
        } else {
            arr2[i] = arr1[j];
            j++;
        }
        i++;
    }

```

```

}
if ( h > mid) { for (ll k=j; k <= high; k++) {
    arr2[i] = arr1[k];
    i++;
} }

```



```

else { for (ll k=h; k<=mid; k++) {
    arr2[i] = arr1[k];
    i++; }
}

```

```

for (ll i=low; i<=high; i++) {
    arr1[i] = arr2[i];
}

```

```

}

```

```

void merge_sort (ll low, ll high) {
    if (low < high) {
        ll mid = (low+high)/2;
        merge_sort (low, mid);
        merge_sort (mid+1, high);
    }
}

```

```

}

```



```
int main()
```

```
{  
    int i;
```

```
    for (i = 1; i < 4; i++) {
```

```
        cout << "Enter N : "; cin >> n;
```

```
        input(n, i);
```

```
        auto start = high_resolution_clock::now();
```

```
        merge_sort(0, n-1);
```


```
        auto stop = high_resolution_clock::now();
```

```
        auto duration = duration_cast<milliseconds>(stop - start);
```

```
        cout << "\n Time for " << n << " : " << duration << endl;
```

```
        return 0;
```

```
}
```

 "F:\4th Semester\CSE\CSE.2202\Lab Final\2\2.exe"

Enter Number of Element_(from 5000 to 50000): 10000

Time of 10000 : 11 milliseconds

Enter Number of Element_(from 5000 to 50000): 20000

Time of 20000 : 21 milliseconds

Enter Number of Element_(from 5000 to 50000): 30000

Time of 30000 : 32 milliseconds

Process returned 0 (0x0) execution time : 11.738 s

Press any key to continue.

