Saturday, 11.06.2022 12:24 PM

Tuesday (Solution)

Merge Sort

$O(n)$

$O(n)$

$< < < < < > > > > >$

$a = [1, 3, 5, 7, 9, 10, 12, 15]$

$b = [2, 4, 6, 8, 11, 13, 14]$

$c = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15]$

Create another array c.

$c[i] \rightarrow$ how many elements are there. So every $a[i]$ will be another array so equal to $a[i]$ +

```
for (i=0; i<n; i++) {
    for (j=0; j<n; j++) {
        if (a[i] > a[j])
            c[i]++;
        else break;
    }
    print (c[i]);
}
```

$O(n \times n)$

$\downarrow$

$O(2n) \Rightarrow O(n)$

$b = [2, 4, 6, 8, 11, 13, 14]$

$c[i] \rightarrow$

$c[2] \rightarrow a[2]$

$c[2+1] \rightarrow a[2]$

$c[2+2] \rightarrow a[2+1]$

$c[2+3] \rightarrow a[2+2]$

$c[2+4] \rightarrow a[2+3]$

$c[2+5] \rightarrow a[2+4]$

$c[2+6] \rightarrow a[2+5]$

$c[2+7] \rightarrow a[2+6]$

$c[2+8] \rightarrow a[2+7]$

$c[2+9] \rightarrow a[2+8]$

$c[2+10] \rightarrow a[2+9]$

$c[2+11] \rightarrow a[2+10]$

$c[2+12] \rightarrow a[2+11]$

$c[2+13] \rightarrow a[2+12]$

$c[2+14] \rightarrow a[2+13]$