**TUGAS 4**

**PRAKTIKUM ANALISIS ALGORITMA**



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Algoritma

**merge(array, left, middle, right)**

1 nLeft := m - left+1 // 1 operasi

2   nRight := right – m // 1 operasi

3   define arrays leftArr and rightArr of size nLeft and nRight respectively

4

5   for i := 0 to nLeft do

6      leftArr[i] := array[left +1]

7   endfor

8

9   for j := 0 to nRight do

10    rightArr[j] := array[middle + j +1]

11  endfor

12

13  i := 0, j := 0, k := left

14  while i < nLeft AND j < nRight do

15     if leftArr[i] <= rightArr[j] then

16        array[k] = leftArr[i]

17        i := i+1

18     else

19        array[k] = rightArr[j]

20        j := j+1

21     k := k+1

22  endwhile

23  while i < nLeft do

24     array[k] := leftArr[i]

25     i := i+1

26     k := k+1

27  endwhile

28

29  while j < nRight do

30     array[k] := rightArr[j]

31     j := j+1

32     k := k+1

33  endwhile

mergeSort(array, left, right)

1 if lower < right then

2      mid := left + (right - left)/2

3      mergeSort(array, left, mid)

4      mergeSort (array, mid+1, right)

5      merge(array, left, mid, right)

Kompleksitas :

T(n) = T(n/2) + T(n/2) + n

T(n) = 2T(n/2) + n

T(n/2) = 2T(n/4) + n/2

T(n) = 2 {2T(n/4) + n/2} + n

T(n) = 22T(n/22) + 2n

T(n/4) = 2T(n/8) + n/4

T(n) = 22{2T(n/8) + n/4} + 2n

T(n) = 23T(n/23) + 3n

T(n) = 24T(n/24) + 4n

…

T(n) = 2iT(n/2i) + in

Karena untuk worst case n/2i = 1

Maka, n = 2i.

Sifat logaritma : log n = i

Sehingga T(n) = n log n + n = O(n log n).