NAUFAL AULIA K N
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PRAKTIKUM ANALGO
WORKSHEET 3

No
Date

1 $T(n) = 2+4+6+8+\cdots+n^2$

$= \sum_{i=1}^{n^2} 2i = n^2(n^2+1)$

$= n^4+n^2$

$n \geq 1$, maka $n^2 \leq n^2$ sehingga

$n^4+n^2 \leq n^4+n^4 = 2n^4,\ n \geq 1$

$\therefore T(n) = 2+4+6+8+\cdots+n^2 = O(n^4)$

$c \geq 2,\ n_0 = 1,\ f(n) = 2n^4$

2 $T(n) = pn^2+qn+r$

O, $pn^2+qn+r \leq (p+q+r)n^2,\ n \geq 1$

$T(n) = O(n^2)$

Ω, $pn^2+qn+r \geq pn^2,\ n \geq 0$

dengan $c \geq p$ dan $n_0 = 1$,

$\therefore T(n) = \Omega(n^2)$

Θ, $O(n^2)$ dan $\Omega(n^2)$ maka

$T(n) = \Theta(n^2)$

3 $T(n) = \sum_{k=1}^{n}\sum_{j=1}^{n}\sum_{i=1}^{n} 1 = n^3$

$T(n) = O(n^3) = \Omega(n^3) = \Theta(n^3)$

4
```
for i <- 1 to n do
    for j <- 1 to n do
        sum[i][j] = a[i][j] + b[i][j]
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$T(n) = \sum_{i=1}^{n}\sum_{j=1}^{n} 1 = n^2$

$T(n) = O(n^2) = \Omega(n^2) = \Theta(n^2)$

5
```
for i <- 1 to n do
    b[i] = a[i]
```

$T(n) = \sum_{i=1}^{n} 1 = n$

$T(n) = O(n) = \Omega(n) = \Theta(n)$

6 a. Jumlah perbandingan

$P = \sum_{i=1}^{n-1}\sum_{j=i+1}^{n} 1 = n(n-1)$

b Maksimum Pertukaran sama dengan jumlah operasi perbandingan $= n(n-1)$

c Kompleksitas Waktu

$O \rightarrow n \geq 0,\ c \leq 1$

$n^2 - n \leq cn^2$

$\therefore T(n) = O(n^2)$

$\Omega \rightarrow n \geq 0,\ 0 < c \leq 1$

$n^2 - n \geq c\,n^2$

$\therefore T(n) = \Omega(n^2)$

$\Theta \rightarrow$ karena $O(n^2)$ dan $\Omega(n^2)$

$\therefore T(n) = \Theta(n^2)$

7 Karena tidak diketahui konstanta C yang digunakan kita tidak bisa mengetahui mana yang lebih cepat. Tapi secara asimptotik, menurut yang diketahui, algoritma A paling cepat dengan $O(\log n)$

8 ~~Kompleksitas~~ P

$p(x) = (\ldots(((a_n x + a_{n-1})x + a_{n-2})x + \cdots a_1)x + a_0)x + a_0$

n penambahan
n perkalian

$\rightarrow n+n$ operasi

Waktu asimptotik P_2

$T(n) = n+n \rightarrow O(n);\ c \geq 2,\ n_0 = 0$

$\therefore$ Kompleksitas kedua algoritma sama.

KENKO 36 Lines, 6 mm