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PRAKTIKUM ANALGO.

① $T(n) = 2 + 4 + 6 + 8 + 16 + \ldots + 2^n$

Deret $= \frac{a(r^n - 1)}{(r-1)} = \frac{2(2^n - 1)}{2-1} = 2^{n+1} - 2$

$O(2^n)$

$T(n) \le C \cdot 2^n$ $\quad n = 1$

$2^{n+1} - 2 \le C \cdot 2^n$

$2 - \frac{2}{2} \le C$

$C \ge 1$

② Buktikan p, q, r (+), $T(n) = pn + qr + r =$

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

* Big O

$T(n) \le C f(n)$

$pn^2 + qn + r \le Cn^2$

$\frac{pn^2 + qn + r}{n} \le Cn$

$p + \frac{q}{n} + \frac{r}{n^2}$

$n = 1$

$C \ge 3$

* Big Ω

$T(n) \ge C(n)$

$pn^2 + qn^2 + r \ge Cn^2$

$p + \frac{q}{n} + \frac{r}{n^2} \ge C$

$n = 1$

$C \le 3$

* Big Θ

$3 \le C \le 3$ atau $C = 3$

③ w.j ← sum, iterasi n, n, n

$T(n) = n^3$

$O(n^3)$	$\Omega(n^3)$
$n^3 \le Cn^3$	$n^3 \ge Cn^3$
$C \ge 1$	$C \le 1$

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

④ for i ← 1 to n do
  for j ← 1 to n do
    mij ← aij + bij
  end for
end for.

$T(n) = n^2$

$O(n^2)$	$\Omega(n^2)$
$n^2 \le Cn^2$	$n^2 \ge Cn^2$
$C \ge 1$	$C \le 1$

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

maka $\Theta(n^2)$

⑤ for i ← 1 to n do
  ai ← bi
endfor

$T(n) = n$

$O(n)$	$\Omega(n)$
$n \le Cn$	$n \ge Cn$
$C \ge 1$	$C \le 1$

$\therefore O(n) = \Omega n \rightarrow \Theta(n)$

⑥ a.) Operasi perbandingan

$Tn = (n-1) + (n-2) + \ldots + 1$

$= \frac{n(n-1)}{2} = \frac{n^2 - n}{2}$

b.) pertukaran terjadi ketikan

$\frac{n(n-1)}{2}$

* Best case.

$T(n) = \frac{n(n-1)}{2} = \frac{n^2 - n}{2}$

* Worst case

$T(n) = \frac{n(n-1)}{2} + \frac{3n(n-1)}{2}$

$= \frac{4n(n-1)}{2} = 2n^2 - 2n$

$O(n^2)$	$\Omega(n^2)$
$2n^2 - 2n \le Cn^2$	$\frac{n^2 - n}{2} \ge Cn$
$2 - \frac{2}{n} \le C$, $n = 1$	$\frac{1}{2} - \frac{1}{2n} \ge C$, $n = 1$
$2 - 2 \le C$	$\frac{1}{2} - \frac{1}{2} \ge C$
$C \ge 0$	$C \le 0$

$\therefore O(n^2) = \Omega(n^2) \rightarrow \Theta(n^2)$

⑦ a) $A \rightarrow O(\log n)$ | a.) $O(\log 8) = O(3 \log 2)$

b.) $B \rightarrow O(n \log n)$ | b.) $O(8 \log 8) = O(24 \log 2)$

c.) $C \rightarrow O(n^2)$ | c.) $O(8^2) = O(64)$

A tercepat dengan 0,301

(2)

$O(n)$ $p^2 = T(n) = 1 + n$

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

p^2 lebih baik dari p

karena $p^2 < p$