

No.1 Soal Big Oh dari T(N)

24 September 2020

7:00

$O(\dots)$ mak. dlm x & y

Execution time sebuah algoritma dinyatakan dalam fungsi: $f(x,y) = 3x^2 + x \log 5 + y \log x + x$, dimana x dan y merupakan input algoritma tersebut. Apa notasi Big-O untuk $f(x,y)$?

Select one:

- ☐ a. $O(x^2)$
- ☐ b. $O(x^2 + x + y \log x)$
- ☒ c. $O(x^2 + y \log x)$
- ☐ d. $O(x^2 + x)$

x cari yg growth-nya tertinggi
 y

$$f(x,y) = 3x^2 + x \log 5 + y \log x + x$$

$O(\log N)$

by default cara baca di SDA
 adlh basis 2

$$\boxed{x^2} \dots \boxed{x} \dots \boxed{y \log x}$$

x & y yang besar

$$O(x,y) = x^2 + y \log x$$

? $\boxed{y \log x + x \log y} = f(x,y)$

$O(x,y) = x \log y + y \log x$

x ? $y \log x$ $x \log y$
 y ? $y \log x$ $x \log y$

$f(x,y) = 2x \log y + x^2 + y$

$O(x,y) = x^2 + y$

x : $x \log y \dots x^2$
 y : $2x \log y \dots y$

$$O(x,y) = x \log y + y$$

$\boxed{x^2}$ $\boxed{x!}$ e^n
 polynom factorial

growth: slower
response time: faster

faster
slower


$$f(x, y) = \underbrace{\log x}_1 + \underbrace{y \log x}_2$$

$$O(x, y) = y \log x$$

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a) `int N` \rightarrow infinite
`while(N >= 0){`

↘ anggap $\boxed{=}$ tdk ada.

a) Choose... 

- Choose...
- $O(N^3)$
- $O(N)$
- $O(N^2)$
- $O(1)$
- $O(\log N)$
- $O(10N)$
- $O(2^N)$

Choose... ▾
Choose...
→ $O(N^3)$
 $O(N)$
 $O(N^2)$
 $O(1)$
 $O(\log N)$
 $O(10N)$
 $O(2^N)$

Choose... ▾

- Choose...
- $O(N^3)$
- $O(N)$
- $O(N^2)$
- $O(1)$**
- $O(\log N)$
- $O(10N)$
- $O(2^N)$

Choose... ▾

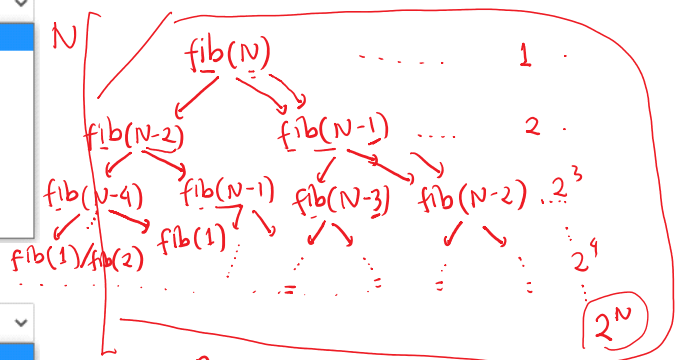
- Choose...
- $O(N^3)$
- $O(N)$
- $O(N^2)$
- $O(1)$
- $O(\log N)$
- $O(10N)$
- $O(2^N)$

Choose...
Choose...
 $O(N^3)$
 $O(N)$
 $O(N^2)$
 $O(1)$
 $O(\log N)$
 $O(10N)$
 $O(2^N)$

$$T(N) = \log N$$

$$O(N) = \log N$$

~~fact(N) -
fact(N-1)
fact(N-2)
N buah pemanggilan.
1/0~~



Checkpoint1-AA Page 3

for loop arit & geom.

nested: dikali
 for (int i = 1 ; i < N ; i += 10) $\rightarrow N$
 nested
 for (int j = 1 ; j < N ; j *= 3) $\rightarrow \log N$
 sequential: ditambah
 $O(N \log N)$

1, 11, 21, 31, ... arit.
 +10 +10 d=10
 1, 3, 9, 27, ...
 x3 x3 r=3
 berapa kali geom. loop

for (int i = 1 ; i < N ; i += 10) $\rightarrow N$
 // ... ;
 for (int j = 1 ; j < N ; j *= 3) $\rightarrow \log N$
 // ... ;
 $T(N) = N + \log N$
 $O(N) = N$

No.3 Soal MCSS

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Untuk algoritma quadratic MCSS, berapa kali tepatnya statement pada loop terdalam (innermost statement, line 15-22 diwarnai merah) dipanggil? $N = a.length$.

Select one:

- ☐ a. $(N \times (N+1))$
- ☒ b. $(N \times (N+1))/2$
- ☐ c. $(N \times (N-1))/2$
- ☐ d. $N!$

```

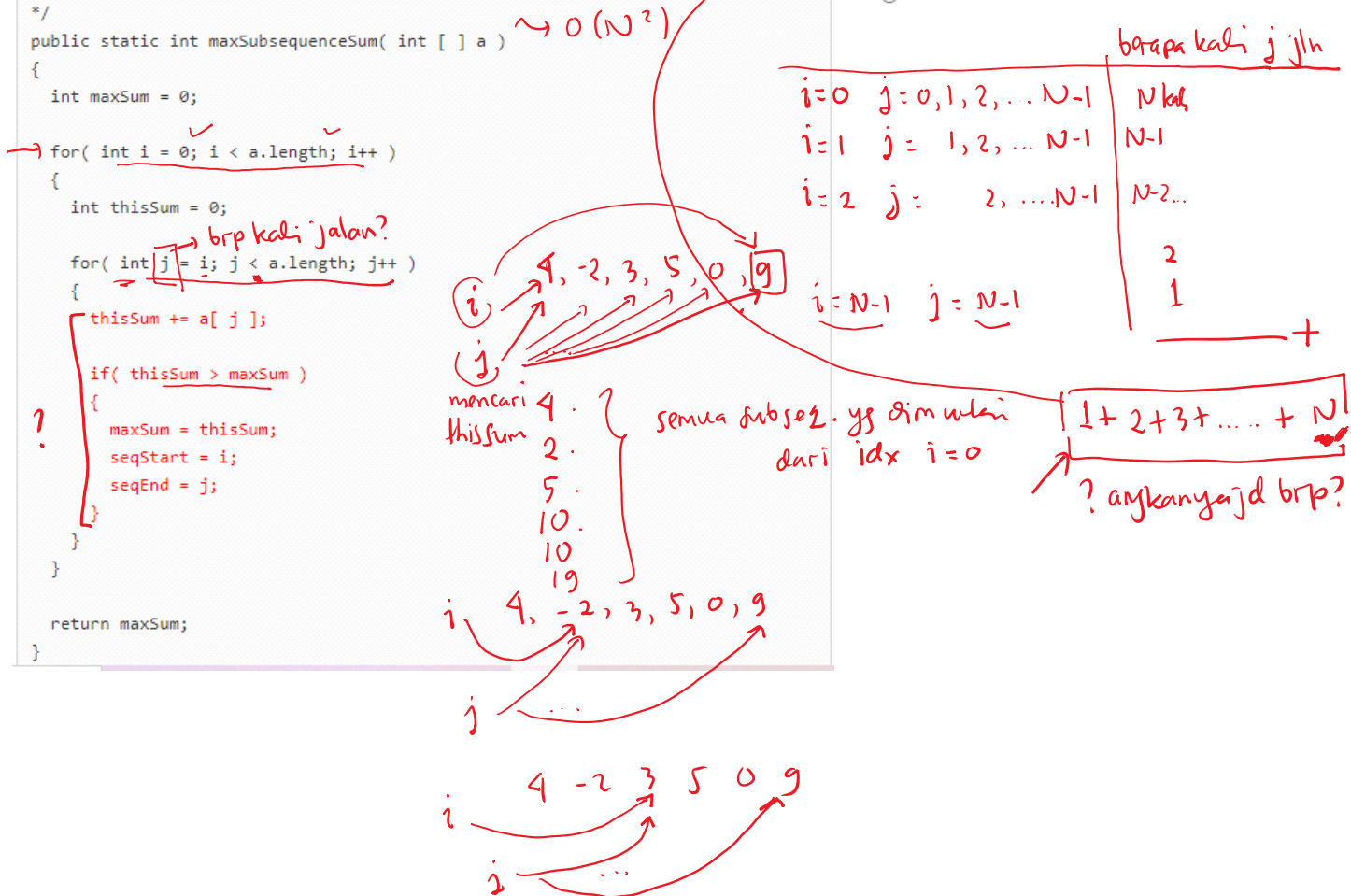
/** figure 5.5 book Weiss, Mark Allen. Data structures & problem solving using
Java 4th
* Quadratic maximum contiguous subsequence sum algorithm.
* seqStart and seqEnd represent the actual best sequence.
*/
public static int maxSubsequenceSum( int [ ] a )
{
    int maxSum = 0;

    for( int i = 0; i < a.length; i++ )
    {
        int thisSum = 0;

        for( int j = i; j < a.length; j++ )
        {
            thisSum += a[ j ];

            if( thisSum > maxSum )
            {
                maxSum = thisSum;
                seqStart = i;
                seqEnd = j;
            }
        }
    }

    return maxSum;
}
    
```



max: ~~4~~ 5 10 19

→ 4, -2, 3, 5, 0, 9

2

4 2 5 10 10 19

subsequence of max. sum.

17?

19?