No.1 Soal Big Oh dari T(N)

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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. $O(x^2 + x)$

growth: slower faster
response time: faster slower

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

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

No.2 Soal Matching Big Oh

24 September 2020 6:58

Berapa kompleksitas dari algoritma di bawah ini?

a)
```
while(N >= 0){
  System.out.println(N);
  N /= 3;
}
```

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

b)
```
static int factorial(int N){
  if(N <= 1) return 1;
  return factorial(N - 1) * N;
}
```

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

c)
```
for(int i = 0; i < N; i++){
  for(int j = 0; j < N; j++){
    n[i][j] = 0;
    for(int k = 0; k < N; k++){
      n[i][j] += a[i][k] * b[k][j];
    }
  }
}
```

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

d)
```
int[] N = new int[5];
if(N.length > 0) N[0] = 100;
```

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

e)
```
static int fibonacci(int N){
  if(N == 1 || N == 2) return 1;
  else return fibonacci(N - 2) + fibonacci(N - 1);
}
```

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

f)
```
for(int i = 0; i < N; i++){
  System.out.println("print something");
  for(int j = 0; j < 10; j++){
    System.out.println("print anything");
  }
}
```

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

for loop arit & geom.

```
for (int i = 1 ; i < N ; i += 10)
    for (int j = 1; j < N ; j *= 3)
```

N → 1, 11, 21, 31, ... arit. (+10, +10, d = 10)

$\log N$ → 1, 3, 9, 27, ... (×3, ×3, r = 3) berapa kali loop geom.

nested: dikali

nested → $O(N \log N)$

sequential: ditambah

```
for (int i = 1 ; i < N ; i += 10)   → N
    //.... ;
for (int j = 1 ; j < N ; j *= 3)    → 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.

```
/** 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;
}
```

Select one:

- a. (N x (N+1))
- b. (N x (N+1))/2
- c. (N x (N-1))/2
- d. N!