

11. The number of operations executed by algorithms A and B is $40n^2$ and $2n^3$, respectively. Prove briefly that A is better than B, deciding the constant 'c' and n_0 , as defined for Big-O notation. [5 Marks]

$f(A) = 40n^2 \leq 41n^2$, $c = 41$, $g(n) = n^2$, for $n \geq n_0 = 0$ it is true.

So, Big-O notation for A is $O(n^2)$

$f(B) = 2n^3 \leq 3n^3$, $c = 3$, $g(n) = n^3$, for $n \geq n_0 = 0$ it is true.

So, Big-O notation for B is $O(n^3)$

We know that for Big-O notation, ~~the~~ algorithms with $O(n^2)$ is better than $O(n^3)$.

Algorithm C executes an $O(n)$ -time computation