Calculating c and n0

Asked 2 years, 2 months ago   Active 1 year, 8 months ago   Viewed 1k times

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I have a quiz in my course where a question goes: "We have found out that $f(n) = 7n^2+3n+8$. This means that the function is of $O(???)$ and that c = ??? and n0 = ???"

I know that $O(n^2)$, but I've searched every source imaginable in order to find out how to calculate c and n0. In some threads here I reckon that you can pick a value for n0 and then compute c with the given value for n0, but I assume my question requires specific (i.e. correct) values for c and n0 since there seems to be only one right answer in the questions in the quiz.

big-o

edited Jul 14 '18 at 17:05   asked Jul 14 '18 at 17:01
Flimzy   ronaldfisher
55.3k ● 13 ● 85 ● 126   11 ● 5

What are the options to your question in quiz as with that you can very easily verify if c and n0 makes n^2 as upper bound or not – Kapil Jul 14 '18 at 17:08 ✏️

There are no options for the answers I'm afraid, it is type in answers – ronaldfisher Jul 14 '18 at 17:21
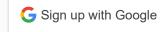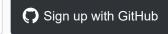
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Big-O notation will tell that certain function will not exceed simpler function beyond constant multiple (c) and for large values of n(n0). As we all know that $7n^2+3n +8$ is $O(n^2)$ as for large values of n, 3n +8 will be insignificant. So we need to c and n0 such that
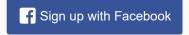
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7 + 3/n + 8/n^2 <= c for all n >=  n0
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if we choose n0 = 1 we will get

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7 + 3 + 8 <= c
```

so we can set c = 18 and n0 = 1 this can be one of the solutions which means

```
7n^2 + 3n + 8 <= 18n^2 for all n >= 1
```

Also I believe there can never be one solution for this answer.

edited Jan 18 '19 at 9:23   answered Jul 14 '18 at 17:33

cxruan   Kapil
3 ● 3   **1,509** ● 10 ● 23
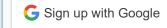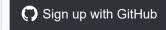
2   should be 18n^2 – Siddharth Chabra Jul 14 '18 at 17:38

        In that case i don't feel that stupid anymore. Thanks – ronaldfisher Jul 14 '18 at 19:37

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