

MITx: 6.008.1x Computational Probability and Inference

Heli

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Week 5: Introduction to Part 2 on Inference in Graphical Models

Week 5: Efficiency in Computer Programs

Exercises due Oct 20, 2016 at 02:30 IST

Week 5: Graphical Models

Exercises due Oct 20, 2016 at 02:30 IST

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Homework Problem: Space and Time Complexity

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Homework Problem: Space and Time Complexity

10/10 points (graded)

• (a) A computer program takes as input an $n \times n$ diagonal matrix, and computes the sum of all of its elements. What is the program's run time complexity in "big O" notation? Select all that apply.

\square $\mathcal{O}(1/n)$

$$lacksquare$$
 $\mathcal{O}(n)$



$$lacksquare$$
 $\mathcal{O}(n^3)$

$$m{arnothing} \mathcal{O}(2^n)$$



Homework Problem: Space and Time Complexity | Week 5: Homework 4 | 6.008.1x Courseware | edX

Exercises due Oct 27, 2016 at 02:30 IST Week 6: Special Case: Marginalization in Hidden Markov Models Exercises due Oct 27, 2016 at 02:30 IST Week 6: Homework 5 Homework due Oct 27, 2016 at 02:30 IST Weeks 6 and 7: Mini-project on Robot Localization (to be posted)	• (b) A computer program takes as input an $n \times n$ symmetric matrix, and computes the sum of all of its elements. What is the program's run time complexity in "big O" notation? Express as a function of n .
	lacksquare
	lacksquare
	$lacksquare \mathcal{O}(n\log n)$
	${f arnothing} {\cal O}(n^2)$
	${f arnothing} {\cal O}(n^3)$
	$ ot \mathcal{O}(2^n) $
	•
	• (c) A computer program stores all strings of length $m{k}$ whose elements are from an alphabet of size $m{m}$. What is its space complexity in "big O" notation? Select all that apply.
	lacksquare
	$lacksquare \mathcal{O}(k^m)$
	$lacksquare$ $\mathcal{O}(mk^m)$



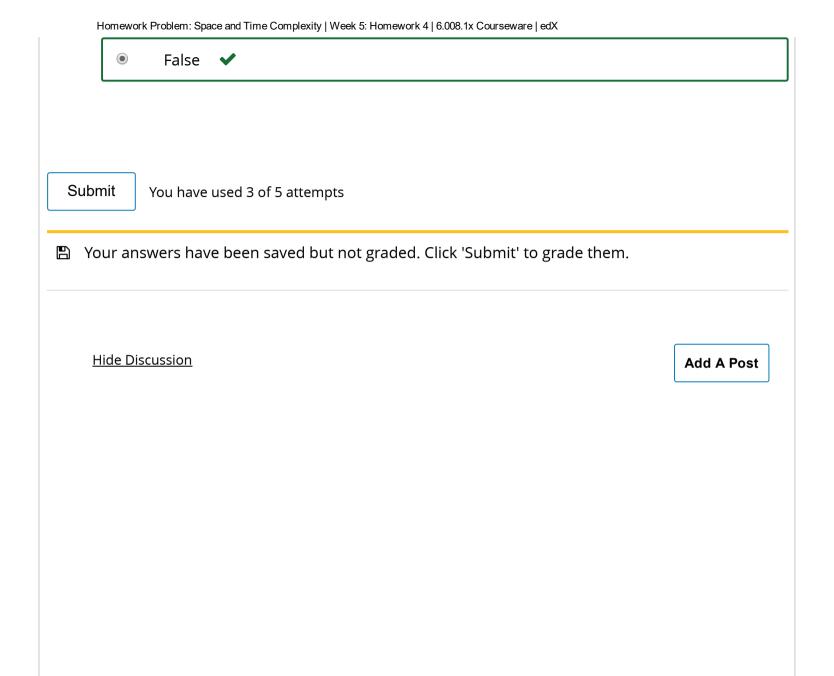
- (d) Consider the same computer program as in part (c) for fixed m=2 (i.e., binary strings). Indicate whether each of the statements below is true or false. While we won't ask for you to input justifications, you should be able to justify your answer with proofs.
 - (i) The space complexity is $\mathcal{O}(3^k)$.

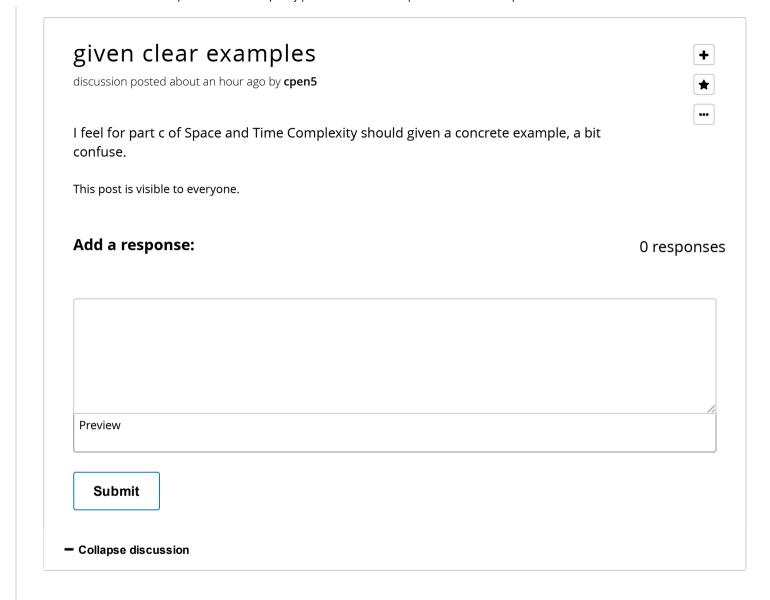


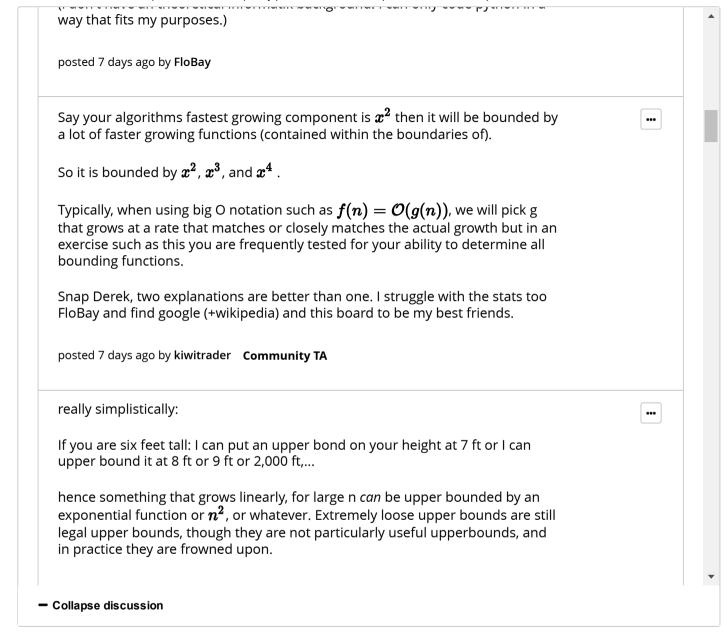
False

• (ii) The space complexity is $\mathcal{O}(\log k)$.

True







Many Big Os

question posted about 6 hours ago by yasser-5

How come to have many big Os for the same process!

How should I go to select all that apply?

This post is visible to everyone.

+ Expand discussion

If ya wanna be technical..(part c)

discussion posted 6 days ago by Grimeson

Shouldn't there also be a ($\log m$) term in there since we cannot hold an arbitrary sized alphabet in a constant sized memory space? (And the...

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+ Expand discussion

Problem (c)

question posted 3 days ago by KantaUrakami

(c) A computer program stores all strings of length k whose elements are from an alphabet of size m. What is its space complexity in "big O"...

This post is visible to everyone.

+ Expand discussion

Problem (a)

question posted 3 days ago by KantaUrakami

(a) A computer program takes as input an $n \times n$ diagonal matrix, and computes the sum of all of its elements. What is the program's run time complexity...

This post is visible to everyone.

+ Expand discussion

Big-O: Select all that apply

discussion posted 6 days ago by AnoopKulkarni

A bit quizzed by these questions. Are we to employ the strict definition of Big-O notation (in terms of f(n) and g(n)) and select all that...

This post is visible to everyone.

+ Expand discussion

When do answers become available for problem sets?

discussion posted 8 days ago by MikeRead68

This does not have a "Show Answers" option. How can I review the questions I missed?

[Edited title for increased civility RG]

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