

Find solutions for your homework

Search

home / study / engineering / computer science / computer science questions and answers / (2 pts) (a) what “better-known”/simpler complexity class i...

Question: (2 pts) (a) What “better-known”/simpler complexity class is equi...

(2 pts) (a) What “better-known”/simpler complexity class is equivalent to $O(N \log N^2)$; briefly explain why. (b) Explain under what conditions `sorted(set(l))` runs faster than `set(sorted(l))` for a list `l` (they both produce the same answer); state the worst-case complexity class of each.

- (a)
(b)

Expert Answer ⓘ



Anonymous answered this
501 answers

Was this answer helpful?

1

0

(a) The given complexity class is $O(n \log n^2)$. We can compute that $\log n^2 = 2 \log n$ and $n \log n^2 = 2n \log n$. Thus the complexity class $O(n \log n^2)$ is equivalent to the complexity class $O(n \log n)$.

(b) If the same elements appear more than once in `l`, then `set(l)` will eliminate the repetitions and then the number of elements will this get reduced. Running the *sorted* function will now take less time since the number of elements have decreased. On the other hand if we do the *sorted* function first, then it would operate on all the elements including the repetitions. Then when the *set* function is applied the repetitions will get deleted. This will take much longer time.

The worst case time complexity for both the classes is $O(n \log n)$ since the sorting takes $O(n \log n)$ time in the worst case and the set formation takes $O(n)$ time in the worst case.

Comment ➤

Up next for you in Computer Science

2. Assume that a function `s` is in the complexity class $O(\sqrt{N})$. (a) What is its doubling-signature: how much more time (by what factor) does it take to solve a problem twice as large (compute an actual number:

See answer

Assume that function `f` is in the complexity class $O(\text{Squareroot } N \text{ Log_2 } N)$, and that for `N = 1,000,000...`

5. (4 pts) Assume that function `f` is in the complexity class $O(\sqrt{N} \text{ Log}_2 N)$, and that for `N = 1,000` program runs in .06 seconds.
(1) Write a formula, `T(N)` that computes the approximate time that it takes to run `f` for any input `n`. Show your work/calculations by hand, approximating logarithms, finish/simplify all the arithmetic.

(2) Compute how long it will take to run when `N = 4,000,000`. Show your work/calculations approximating logarithms, finish/simplify all the arithmetic.

See answer

See more questions for subjects you study

Questions viewed by other students

Q: 1. In 1972, Intel's 8008 processor could execute 200,000 (200 thousand) instructions per second; at present, an Intel Core 2 processor can execute 3,200,000,000 (3.2 billion) instructions per second. Let's assume that we program the 8008 to run a fast $O(N \log^2 N)$ sorting algorithm, and program the Core 2 to run a slow $O(N^2)$ sorting algorithm. Assume the time to sort `N` values on the...

A: See answer 100% (1 rating)

Q: The following two functions each determine the distance between the two closest values in list `1`, with `len(1) = N`. (a) Write the complexity class of each statement in the box on its right. (b) Write the full calculation that computes the complexity class for the entire function. (c) Simplify what you wrote in (b). `a = set()` for `i` in range (`len(1)`): for `j` in range (`len(1)`): if...

A: See answer 100% (2 ratings)

Post a question

Answers from our experts for your tough homework questions

Enter question

Continue to post

15 questions remaining



Snap a photo from your phone to post a question

We'll send you a one-time download link

888-888-8888

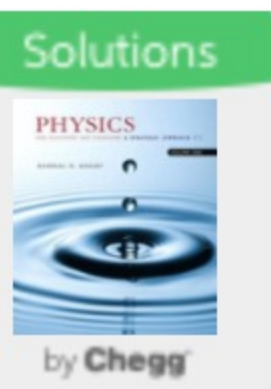
Text me

By providing your phone number, you agree to receive a one-time automated text message with a link to get the app. Standard messaging rates may apply.

My Textbook Solutions



Chemistry
4th Edition



Physics For
Scientists...
4th Edition



Single
Variable...
7th Edition

View all solutions

COMPANY

About Chegg
Become a Tutor
Chegg For Good
College Marketing
Corporate Development
Investor Relations
Jobs
Join Our Affiliate Program
Media Center
Site Map

LEGAL & POLICIES

Advertising Choices
Cookie Notice
General Policies
Intellectual Property Rights
Terms of Use
Chegg Tutors Terms of Service
Global Privacy Policy
DO NOT SELL MY INFO
Honor Code

CHEGG PRODUCTS AND SERVICES

Cheap Textbooks
Chegg Coupon
Chegg Play
Chegg Study Help
College Textbooks
eTextbooks
Chegg Math Solver
Mobile Apps

Online Tutoring
Sell Textbooks
Solutions Manual
Study 101
Textbook Rental
Used Textbooks
Digital Access Codes
Chegg Money

CHEGG NETWORK

EasyBib
Internships.com
Studyblue
Thinkful

CUSTOMER SERVICE

Customer Service
Give Us Feedback
Help with Chegg Tutors
Help with eTextbooks
Help to use EasyBib Plus
Manage Chegg Study Subscription
Return Your Books
Textbook Return Policy



OVER 6 MILLION
TREES PLANTED

© 2003-2020 Chegg Inc. All rights reserved.