

Find solutions for your homework

Search

home / study / engineering / computer science / computer science questions and answers / 5. (5 pts) Assume that function f is in the complexity class...

Question: 5. (5 pts) Assume that function f is in the complexity class O(N (log N)^2)

python

n log n algorithms

5. (5 pts) Assume that function f is in the complexity class $O(N (\log N)^2)$, and that for $N = 1,000$ the program runs in **10 seconds**.

(1) Write a formula, $T(N)$ that computes the approximate time that it takes to run f for any input of size N . Show your work/calculations by hand, approximating logarithms, then finish/simplify all the arithmetic.

(2) Compute how long it will take to run when $N = 1,000,000$ (which is also written 10^6). Show your work/calculations by hand, approximating logarithms, finish/simplify all the arithmetic.

Show transcribed image text

Expert Answer ⓘ

anonymous answered this

3,046 answers

Was this answer helpful?



1



1

$$T = k * n(\log_2 n)^2$$

On putting $n=1000$ and $T=6$ we get

$$10 = k * 1000(\log_2 1000)^2$$

$$k = 1.0006 * 10^{-4}$$

And Hence we get the formula

$$T = 1.0006 * 10^{-4} * n(\log_2 n)^2$$

Q2

Hence on putting $n=1000000$

we get

$$T = 1.0006 * 10^{-4} * 10^6(\log_2 10^6)^2$$

$$T = 39750.58$$

View comments (1) >

Practice with similar questions

Q: Assume that method m is in the complexity class $O(N \log_2 N)$, and that for $N = 1,000$ the program runs in 4 seconds.
 (a) write a formula, $T(N)$ that computes the approximate time that it takes to run m for any inout of size N. Show your work/calculations by hand, approximating logarithms, finish/simplify all the arithmetic. (b) Compute how long it will take to run when $N = 1,000,000$...

A: See answer 100% (1 rating)

Q: 5. (5 pts) Assume that function f is in the complexity class $O(N (\log_2 N)^2)$, and that for $N = 1,000$ the program runs in 10 seconds. (1) Write a formula, $T(N)$ that computes the approximate time that it takes to run f for any input of size N. Show your work/calculations by hand, approximating logarithms, then finish/simplify all the arithmetic. (2) Compute how long it will take to run...

A: See answer 100% (3 ratings)

Up next for you in Computer Science

4. (6 pts) The following functions each determine if any two values in a list sum to a sum. As is shown in the...

```
4. (6 pts) The following functions each determine if any two values in a list sum to a sum. As is shown in the
list, (a) write the complexity class of each statement on its right, where S = 1+ceil(k). (b) Write the full
algorithm for each function, showing the complexity class for the entire algorithm. (c) Write the code for each
function, showing the complexity class for the entire algorithm. (d) Write the complexity class for the entire
algorithm for each function.
```

See answer

7c. (5 pts) Write the complexity class of each algorithm, assuming the required data structure stor...

```
7c. (5 pts) Write the complexity class of each algorithm, assuming the
(1) Remove the value at the middle of a linked list (assuming
(2) Use binary search to determine whether a value is in a v
(3) Remove the 10 smallest values in a list by repeatedly
(4) Remove the N/2 smallest values in a list by repeatedly
(5) Remove the N/2 smallest values in a list by sorting it
```

See answer

See more questions for subjects you study

Questions viewed by other students

Q: Assume that function f is in the complexity class $O(\sqrt{N} \log_2 N)$, and that for $N = 1,000,000$ the program runs in 06 seconds Write a formula, $T(N)$ that computes the approximate time that it takes to run f for any input of size N. Show your work/calculations by hand, approximating logarithms, finish/simplify all the arithmetic. Compute how long it will take to run when N...

A: See answer 100% (3 ratings)

Q: Fill in the last line of the three empty rows, which shows the size of a problem can be solved in the same amount of time for each complexity class on a new machine that runs nine as fast as the old one. Solve by hand when you can, use Excel or a calculator when you must: I used a calculator only for $O(N \log_2 N)$ and solved it to 3 significant digits. Solving a problem in the same...

A: See answer 100% (5 ratings)

Show more ▾

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.

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

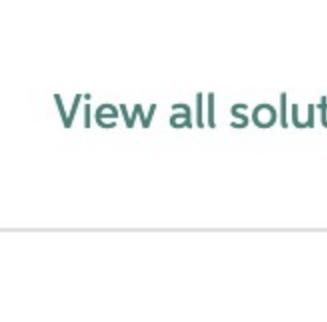
888-888-8888

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

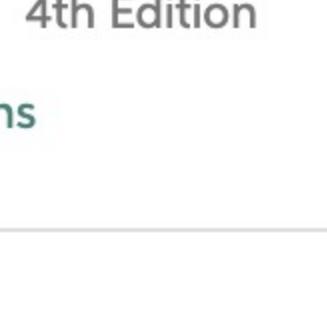
Solutions



Chemistry

4th Edition

Solutions



Physics For Scientists...

4th Edition

Solutions



Single Variable...

7th Edition

View all solutions

