

[CSIE 1212]

Data Structure and Algorithms

資料結構與演算法

- Course Information

Short introduction of my part

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(co-teach with Prof. Hsuan-Tien Lin)
Spring 2024

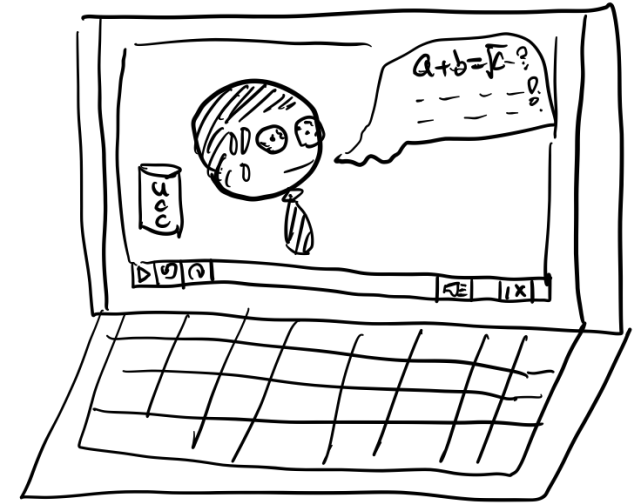


Agenda

- String Matching (2 hr)
 - Overview
 - Rabin-Karp String Matching Algorithm
 - (after class) KMP String Matching Algorithm
 - W9 With-Lecture Quiz
 - mini HW H
- Course overview of second half (1 hr)
 - Overview of the second half
 - Overview of the software development team game (4/23, next Tuesday)

Why Learn with Video?

- Tailored for personal preferences
—> better learning efficiency!
- Choose the best time & place to learn
- Learn at your preferred pace
 - Faster playback rate when you can
 - Skip the easy part or what you already know
 - Repeat the difficult part or pause to think & take note
- Ask questions with video!
(on NTU COOL)



Learning with Video (Before Class)

Weekly “Menu”

Video clip by subject
(10-30 min / clip)

+

Online quiz problems (easy)
(5-10 min / prob.)

+

Part of
programming grade

Mini homework
(programming)

W14 - Red Black Tree

- Slides: rbtree.pptx
- Introduction
- Height Bound Proof
- Rotation
- Insertion
- Quick Review
- Deletion

A staircase diagram is overlaid on the menu items, with numbers 1 through 6 in boxes. The steps start from 'Introduction' (1), go down to 'Height Bound Proof' (2), down to 'Rotation' (3), down to 'Insertion' (4), down to 'Quick Review' (5), and finally down to 'Deletion' (6). A vertical green line is on the left of the menu items.

問題 1 1分

With black height h , what is the **smallest** possible number of nodes a valid red-black tree may contain?

問題 2 1分

With black height h , what is the **largest** possible number of nodes a valid red-black tree may contain?

問題 3 1分

What an **empty** red-black tree will be after successively inserting 41,38,37,12,19,8 into the tree? Please paste the picture of the red-black tree after those insertion operations.

Assigned on Tuesdays
for each week

Suggestion:
Finish before next class

Syllabus, W9-16

Week	Date	Video Topic	Activity / Class
9	4/16	String matching [new]	
10	4/23	Graph [old]	Software development team game
11	4/30	Disjoint set [old]	
12	5/7	Red-black tree [new]	
13	5/14	B-tree [new]	Earth game
14	5/21	Hash table [new]	Hsin-Mu is out of town; online class
15	5/28	Linear-time sorting [old]	Kahoot!
16	6/4	Final exam	

Video

- English-subtitled video are already available on NTU COOL (99% the same)
- You can pace yourself according to your own schedule
- Four lectures are planned to be re-recorded this semester
- You are encouraged to ask questions on NTU COOL.
 - We will answer them ASAP (< 24 hr)
 - We will pick good questions and explain them in detail in some lectures
- **Expect spending 3 more hours every week**
(for video)

In-Class Logistics

- SLIDO:
 - During the class, I will only answer questions related to the lecture
 - At the end of the class, if time permits I will answer questions unrelated to the lecture
- Q: Do I need to come to the class?
 - You don't have to if you know the implications / consequences
 - You have to submit the quizzes on time
 - You have to participate in the activities (4/23, 5/14, 5/28) to receive the corresponding grade
 - If you come to the lecture, you can interact with me in real time

Misc Messages from HsinMu

- It will take some time for me to warm up and get up to speed with the large class
- You do not have to learn everything “in a single pass”
- Please try to be polite (even when in negative mood), and I will do the same~
- I can often make mistakes!
- Consider come and talk to me physically if you have trouble understanding the course material
- Good luck!!

Activity Grade (10%)

- 3% Software development team game
- 4% Earth game
- 3% Kahoot! (Review before final exam)
- 3% 7 With-Video Quizzes (W9-W15)

- Total is capped at 10%

SLIIIIIIIIIIIDO TIME