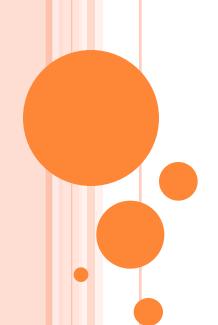




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What You Need to Do in DSA

- 5 questions to be raised in class
- Weekly quizzes (You can safely skip one of them)
- Reading assignments for flipped learning
- 6 homework sets: Hand-written and programming
- Midterm exam: Hand-written and programming
- Final project: Programming

Time consuming!

DSA at NTU As good as the best ones in the world

→ Be prepared to work hard!

If you finish all of the above, it's hard not to pass!



Course Goals and Prerequisites

Goal

- Use software to synergize two resources effectively
 - Computation: CPU, GPU, etc.
 - Storage: memory, disk, network, etc.

A program is...

- Algorithms + Data Structures = Programs
- Prerequisites
 - C: required
 - C++: preferred (You need to catch up soon!)
 - High-school math



Course Outline

For Evaluation...

- C++ basics
- Arrays, linked lists, recursion
- Analysis tools
- Stacks, queues, and deques
- Trees
- Heaps and priority queues
- Hash tables, maps, and skip lists
- Search trees
- Sorting
- Strings and dynamic programming
- Graphs



Textbook and Reference

- Textbook: <u>Data Structures and Algorithms in C++</u>, 2nd edition by Goodrich, Tamassia, and Mount.
 - Only selected topics will be covered
 - Learning to read a textbook is part of the course
- Reference: <u>Fundamentals of Data Structures in C++</u>, 2nd edition by Horowitz, Sahni, and Mehta
 - Some supplementary material comes from this reference
 - It is also a popular textbook for DSA



About the Instructor

○ J.-S. Roger Jang 張智星

Email: jang@mirlab.org

Skype: roger_jang

Mobile: 0953-154-045

• Office: 德田館 509

Office hours

Right before/after our class, or by appointments

Research

 Applications of AI/ML to real-world problems, including music analysis & retrieval, speech scoring, speaker recognition, image recognition, fintech, etc.

Teaching

Has taught DSA 7 times



More about the Instructor

- The instructor is friendly and willing to help...
 - Will you repeat the previous code/slide? Yes!
 - Will you discuss with me after class if necessary? Yes!
 - Will you pardon my silly questions? No question is silly at all!
- He is also ambitious and willing to experiment with new ways of teaching!
 - Flipped learning/classroom
 - Group learning

Any feedbacks and suggestions for effective learning/teaching are highly welcome!



About TAs

TAs



- 學士班:蔡昀達、張凱捷、施長元
- 碩士班:李岳庭、蕭勝興、陳宣伯、傅皓群、翁仲威
- Mailing alias: ta4dsa@mirlab.org
 - All the TAs and instructor receive emails to this account.
- Office hours
 - One hour per week for each TA (To be announced on FB)
- TAs will try their best to help your learning in DSA, and you should pay due respect to them too!



Important Links

- Websites for DSA
 - DSA websites: for schedule and homework, etc.
 - DSA on Facebook: for announcements and discussions, etc.
 - CEIBA: for mailing list, records of scores, etc.
 - o https://ceiba.ntu.edu.tw/1062dsa
- Recordings for DSA
 - Since 2015, see DSA website



Rules of the Course

- Will you give me a second chance if I copy homework from other people? No.
- Could you let me pass because I will be kicked out by the ½ rule? No.
- Will you change my score upon my request? No, unless it is a mistake on our part

Be prepared to follow the rules if you take the course!

No cheating! No lying! No plagiarism!



Grading Policy

10% for course participation

Don't miss this part!

2% for each in-class question/answers

2% for each FB answering

Quizzes: 15%

Homework: 25%

Midterm exam: 25%

Final project: 25%

Final grades are based on scores and ranking.

The instructor reserve the rights to

- Adjust percentage of each categories if necessary
- Determine the way to combine scores and ranking



More about Grading

- Grade statistics
 - Usually we have 30%~40% of A+ and A
- Grade computation
 - Raw score computation in double → rounding to integers → final letter grades
- The final grade won't be modified unless it is due to mistakes on our part
- Only A+ students are qualified for recommendation letters from me (for advanced study, etc.)



About Homework

- All programming homework are to be carried out in C++.
- Draft of homework will be given 2 weeks before the deadline. Final specs will be given 1 week before the deadline
- Discussions are encouraged. Plagiarism is strictly prohibited!
- About deadlines
 - No extension allowed unless you have legitimate reasons
 - Overdue penalty for homework, up to a delay of 7 days
 - 80% weighting for overdue of 0-24 hours
 - (80%)² weighting for overdue of 24-48 hours
 - (80%)³ weighting for overdue of 48-72 hours

o ...



About Flipped Learning

- Before you come to the class
 - Watch assigned videos
 - Read assigned material
 - Try out related examples and understand them
- During the class
 - Coverage of hard-to-understand parts
 - Questions and answering
 - Quiz
- After the class
 - TA office hours and 演習課
 - Homework





Golden Rule to Pass the Class

- Catch up from day 1!
- Ask questions (in class or on FB)
- Discuss with classmates and TAs
- Have fun (and spend hours) writing programs
- Understand theorems and proofs

If you try your best to finish all the requirements, it's hard not to pass!



Do I Need to Take the Course?

- I want to major in CS → Yes!
- I want to find a job related to core CS → Yes!
- I want to know basic programming >> No!
 - You should consider NTU micro courses of CS+X
- I want to do programming for my research → No!
 - You should consider
 - Scientific Computing (MATLAB)
 - Courses of Machine Learning offered at NTU/CSIE



About Enrollment

- Ask yourself why you want to take this class (See prev slide)
- Extra enrollment will be taken up to the classroom's limit
- Auditing is also welcome.

Think before you choose to enroll.

If you have chosen to do so, welcome aboard!



Todo List for Week 1

- Make sure you are well connected
 - Understand the class policy thoroughly.
 - Make sure your email on CEIBA is good.
- Homework for week 1
 - See our DSA schedule page

Welcome aboard!
Any questions?