CSIE1212: Data Structures and Algorithms

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Course Introduction, February 15, 2022

Three Warnings Before (Signing for) the Course (1/3)

警告: High Expectations

- goal of NTU DSA class:
  as good as the best ones in the world
- tentatively, 4 homework sets, midterm exam, final exam
  (`https://cool.ntu.edu.tw/courses/12999/`)
- writing assignments and time-consuming programming assignments

be prepared to **work hard**!

Three Warnings Before (Signing for) the Course (2/3)

警告: Strict Instructors

- 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 $1/2$ rule? No.
- Will you change my score from *F* to *C*? No.

be prepared to **follow the rules**!

Three Warnings Before (Signing for) the Course (3/3)

警告: Uncertain Outcome

- second time co-teaching a super big class together
- needing to experiment to scale
- pandemic adds uncertainty
- How many people will not pass?
  We don't know yet.
- Will your investment (time) get good return (knowledge)?
  No guarantees, but we'll try our best.

be prepared to **take some risks**!

Wise Words

給資訊系的同學們：努力加油

給想加選的同學們：審慎考慮

Three Encouragements After Selecting the Course (1/3)

鼓勵: Yes, You Can Learn Them

- goal of NTU DSA class:
  let you learn as much as the best students in the world
- we know how to teach you
- a big team of willing-to-help TAs
- be confident about yourself

be prepared to **learn a lot**!

Three Encouragements After Selecting the Course (2/3)

鼓勵: Friendly Instructors

- Will you repeat the previous code/slide again? Yes.
- Will you discuss with me after class if I don't understand? Yes.
- Will you pardon my silly questions? There are no silly questions.
- Will you come to CSIE Night? Sure!

be prepared to **ask us questions**!

Three Encouragements After Selecting the Course (3/3)

鼓勵: Creative Classroom

- variety of learning experience, including meta

- always want to have more fun
  —learning does not have to be just boring studies
- teaching team: willing to learn with the whole class

be prepared to **have some fun** with us!

Some Historical Notes

A while ago, when I was (we were) a freshman in NTU CSIE (1997).....

- 「計程」有兩學期，上學期教C，下學期教C++
- 大二上學期教「資料結構」
- 大二下學期教「演算法」

Then, in my senior year (2001).....

- 「計程」變成一學期，大一下學期教「物件導向程式設計」(Java)
- 大二上學期教「資料結構與演算法上」
- 大二下學期教「資料結構與演算法下」

Then, starting 2010.....

- 物件導向程式設計變爲選修
- 大一下學期教「資料結構與演算法」
- 大二上學期教「演算法設計與分析」

Reasons

- 兩學期的「計程」變成一學期、「物件導向程式設計」變成選修：
  相信同學們可以有自己學習不同語言的能力。
- 把「資料結構」及「演算法」合成一門課：
  兩者互相依賴，其實不容易分散來教。
- 把「資料結構與演算法上/下」區分成「資料結構與演算法」和
  「演算法設計與分析」：
  - 前者以實作爲主，銜接計程做更深入的程式練習
  - 後者以分析爲主，建立在前者的基礎上探討更多不同的演算法

Co-Teaching Information

- instructor:
  蔡欣穆 Michael Hsin-Mu Tsai (hsinmu@csie.ntu.edu.tw)
  林軒田 Hsuan-Tien Lin (htlin@csie.ntu.edu.tw)
- course webpage, announcement:
  https://cool.ntu.edu.tw/courses/12999/ (NTU COOL)
- casual (but interactive) discussion:
  discord (TBA)
- course time: Tuesdays 13:20–16:20
  - first half (taught by Hsuan-Tien)
    - 20-min break in total liberally in the middle
    - 10-min earlier ending (i.e. usually ends 16:10) to be fair
    - office hour by appointment
  - second half (taught by Michael): TBA

rule of thumb to facilitate passing:
interact with teaching team early and frequently

Co-Teaching: Enrollment and Classrooms

- type 1: effectively unlimited
- original plan:
  - main classroom: CSIE R103
  - other classrooms
    - CSIE R102
    - CSIE R104
    - anywhere with an internet, like your dorm room!
  - auditing: welcomed (to sit) only if there is an empty chair
- current plan under pandemic: fully online

please think about loads before you choose to enroll

Teaching Assistants

- TAs: see NTU COOL for full list
- TA email: `dsa_ta@csie.ntu.edu.tw`
  - 24 TAs and 1 instructor around, usually faster than sending to individual
  - for homework questions, please tag your email (TBA) for efficient processing
- office hours and formats: (TBA)

very friendly TAs; ask them more questions!

THE Principle

Taking any unfair advantages over other class members is not allowed.
It is everyone's responsibility to maximize the level of fairness.

Honesty

NO CHEATING

NO LYING

NO PLAGIARISM

very very very very serious consequences

Grade

- homework, midterm exam, final exam
- others: participation in class activities
  - first TA hour
  - in-class quizzes
  - earth games, etc. (TBA)
- raw score goes through some order-preserving normalization steps, not just using default thresholds of university
  - raw score 80 with term rank A: possible
  - raw score 80 with term rank B: possible
  - raw score 60 with term rank F: possible
  - raw scores 80, 60 with term scores B, B: possible, but unlikely
  - raw scores 80, 60 with term scores F, B: impossible

from the principle: **no individual score change**

Collaboration and Open-Book

- homework discussions: encouraged
- but fairness?
  write the final solutions alone and understand them fully
- references (books, notes, Internet):
  consulted, but **not copied from**
- no need to lend/borrow solutions

to maximize fairness (everyone's responsibility),
lending/borrowing/buying/selling/trading not allowed

Collaboration and Open-Book

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Deal? If your classmate wants to borrow homework from you, what do you say?

Plagirism vs. Safe

Plagiarism

- copy others' code, directly or replacing the variables with your own names
- ask another student to tell you her/his solution/code or debug your solution/code line by line
- copying some lines/summarizing from the shared discussion note of some students (online or offline)
- imitate an internet solution

Safe

- ask another student to tell you her/his solution ideas, write down your solution with your own understanding of the idea
- ask another student to share their ideas in debugging, and debug on your own
- find an internet solution, read thoroughly, and write down your understanding in your own words

line-by-line similarity $\Longrightarrow$ plagiarism

Homework

- students: justify solutions clearly
- TAs: evaluate solutions fairly
- no individual extension unless not violating the principle (e.g. institute-established cases of illness or emergency)

late penalty: linear increase from 0% to 100% after five days (e.g. lose 20% of value every day)

Textbook

Introduction to Algorithms, 3rd edition, 2009, MIT Press by Cormen, Leiserson, Rivest, and Stein.

- the 'bible' to learn about algorithms
- **learning to read a textbook** can help you deepen your knowledge
- getting the book:
  - NTU Library: reserved copy in the shared course material area
  - R536: will put one shared copy to be read in the room
  - do not use a pirated copy (**learning to respect copyright**!)
  - If the book is not affordable to you: email me (`htlin@csie.ntu.edu.tw`) privately and I'll see how I can help.

Mandarin and English

- Mandarin: main language
- English: often encountered
  —coding, website, assignments, some teaching . . .
  —important for your future and you are recommended to practice

don't be afraid of English

How to Pass the Class?

- interact with our friendly TA team!!!
  - identify first TA hour(s) to visit, and keep the connection(s)
  - interact informally through discord
  - email questions (with tags) welcomed too
- catch up from day 1
- ask questions (inside and outside class)!
- have fun writing programs
- understand writing proof
- face the difficulty gap between teaching and homework bravely and smartly
- be confident: yes, you can; yes, we can!

Enjoy the Class! Questions?