Data Structures
資料結構

關於老師

- Office: EC709
- Office hour: 2DX, or by appointment
- Phone: 56689
- E-mail: wangts@cs.nctu.edu.tw
- Questions?

About the Teaching Assistants

- TAs: all my graduate students
- TA office: EC031
- TA phone: 56681
- What the TAs will do: Grading the exams, grading the assignments, programming assignment demo, answering questions
- I will ask the TAs to provide help hours in the evenings and at noon, starting next week.

Information about This Course

Requirements:

- Individual programming projects x5 (40%)
  - Programming language: C++
  - Environments: VS2012/2013/2015, Dev-C++
  - Two demos (randomly assigned) per student
- Written exams x2 (25%, 30%)
- Quizzes (5%) and participation (5%)

Web Pages: eCampus (dcpc.nctu.edu.tw)

Textbook:

Fundamentals of Data Structures in C++

Horowitz, Sahni and Mehta, Computer Science Press

Some Course Q&As

- Q: Do I need to buy the textbook?
  - If you just want to pass this course, maybe not. But it is always a good training to learn buy reading from written materials, not just course slides.
  - To encourage reading textbooks, I will at times give out reading assignments from the textbook, which will only be mentioned very briefly in the lectures. A small part of the exams (≈10%) will be from such reading assignments.
- Q: Do I need to buy the English textbook?
  - Again, ff you just want to pass this course, maybe not. But you need to get used to it. Further more, all the exams are in English, and I will not translate the terminologies used.

Some Course Q&As

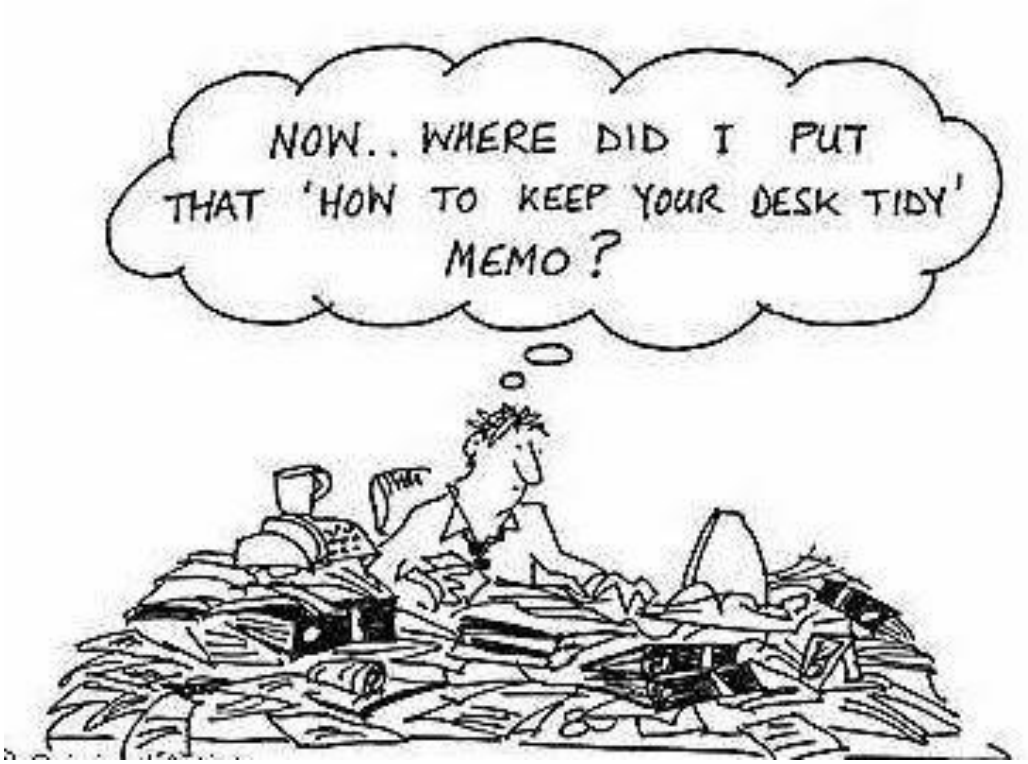
- Q: What if I have difficulties following the lectures?
  - Ask right way. Or use the discussion boards. You are helping yourself and your classmates. In addition, you can get credits for this.
  - Approximately every 2-3 weeks, I will open part of the class time as simply Q&A sessions. You can ask any questions about the lectures and assignments then.
- Q: What if I can't finish my programming assignments on time?
  - There will always be some grace period. A little more effort is always worth it.
  - As me, ask the class TAs, ask the TAs in the computer labs, and ask others.
  - Always start early.

About Academic Honesty

- Assignment copying:
  - There will be copy detection for each assignment.
  - If you are suspected of copying, you might be asked to rewrite part of your assignment during demo. (Well, if you can memorize how to do it correctly, that's ok, too!)
- Cheating in exams:
  - That means a grade of zero for the exam.

What are "Data Structures", Anyway?

- Simply said, "data structures" are how you organize data.
- Data structures are fundamental in software design: Software systems need to process "data".
- Q: What "data structures" have you used, or simply “heard of”?



The Role of This Course

CS Courses

Year 1

Programming
OOP

Year 2

Data Structures
Intro. Algorithms

Years 3+

Advanced
Courses

You know what this is.

What are the common operations on these data?

Which operations are more important?

How can you organize these data?

Is the way you organize your data practical if you have 100000 entries?

This is our next example:

Important Aspects of this Course

- Specification of a data structure (abstraction)
  - Inputs, outputs, and operations
- Implementation of a data structure
  - Internal representation of data (may involve another data structure)
  - Algorithms for operations
  - Correctness, complexity (performance)
  - There might be more than one implementations for a data structure
- How to choose the data structure(s), and how to use them, for your problems.

You Need to Know C++!

- Important aspects in C++ that you need to know:
  - Constructors and destructors
  - Dynamic memory management
  - Templates
  - Function and operator overloading
  - Pointers
  - Recursion
- We will cover some STL (very useful!)


Q&A