NUS National University of Singapore

School of Computing

CS1020 Data Structures and Algorithms I

Lecture Note #0

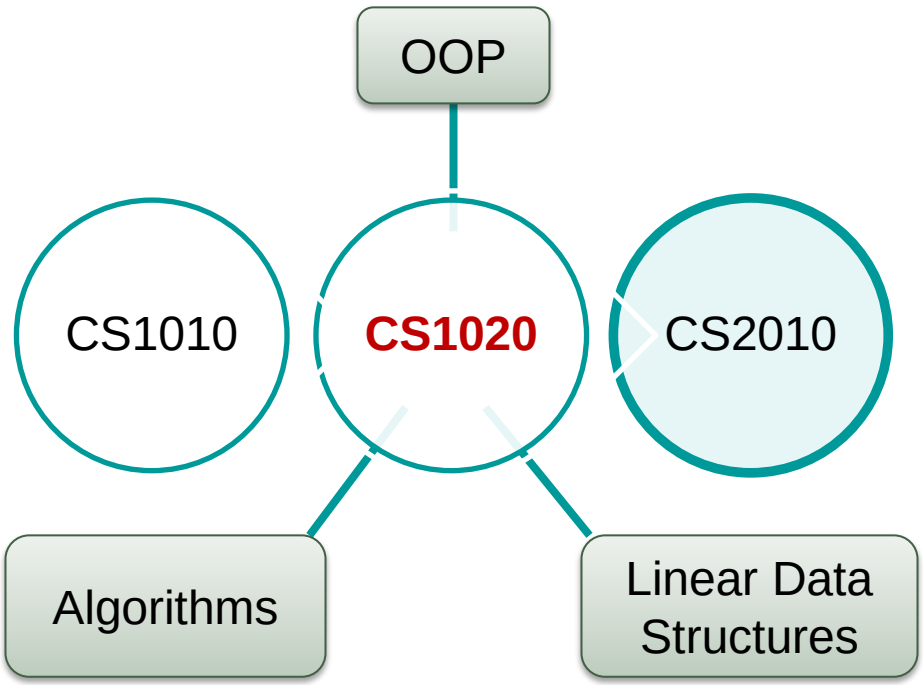
Course Admin

(AY2015/6 Semester 2)

Outline

- Module Overview
- Objectives
- Staff
- Resources
- Schedules
- Assessments

Module Overview



Object Oriented Programming (OOP) model

- Using Java

Classic data structures

- Lists, Stacks, Queues

Basic analysis of algorithm

Recursion

- More advanced than CS1010

Sorting algorithms

- More advanced than CS1010

Hashing

Objectives

- With this course, you should be able to:
  - Use object oriented modeling to formulate solution
  - Utilize appropriate simple data structures in problem solving
  - Understand data abstraction
  - Understand recursion
  - Understand program efficiency through analysis of algorithms

Lecturers

- Module coordinator
  A/P Tan Sun Teck
  COM2-03-02
  tanst@comp.nus.edu.sg

- Sectional Group 2 @ ICube Auditorium

- **Mr. Aaron Tan Tuck Choy**
  COM1-03-12
  tantc@comp.nus.edu.sg
- Sectional Group 1 @ SR1

Module website

http://www.comp.nus.edu.sg/~cs1020

Module Info...
- Description
- Staff
- Schedules
- Policies

Resources...
- Books
- Online
- Lectures
- Errata

CA...
- Tutorials
- Takehome-Labs
- Sitin-Labs
- Term Tests
- Exams
- CA Marks

Misc...
- Practice Ex
- CS1010 Stuffs

- **Welcome to CS1020! (AY2015/6 Semester 2)**
- Important links:
  - Java API Specification Edition 7
- This website is currently being updated for the coming semester. More information will be updated progressively. Thank you.

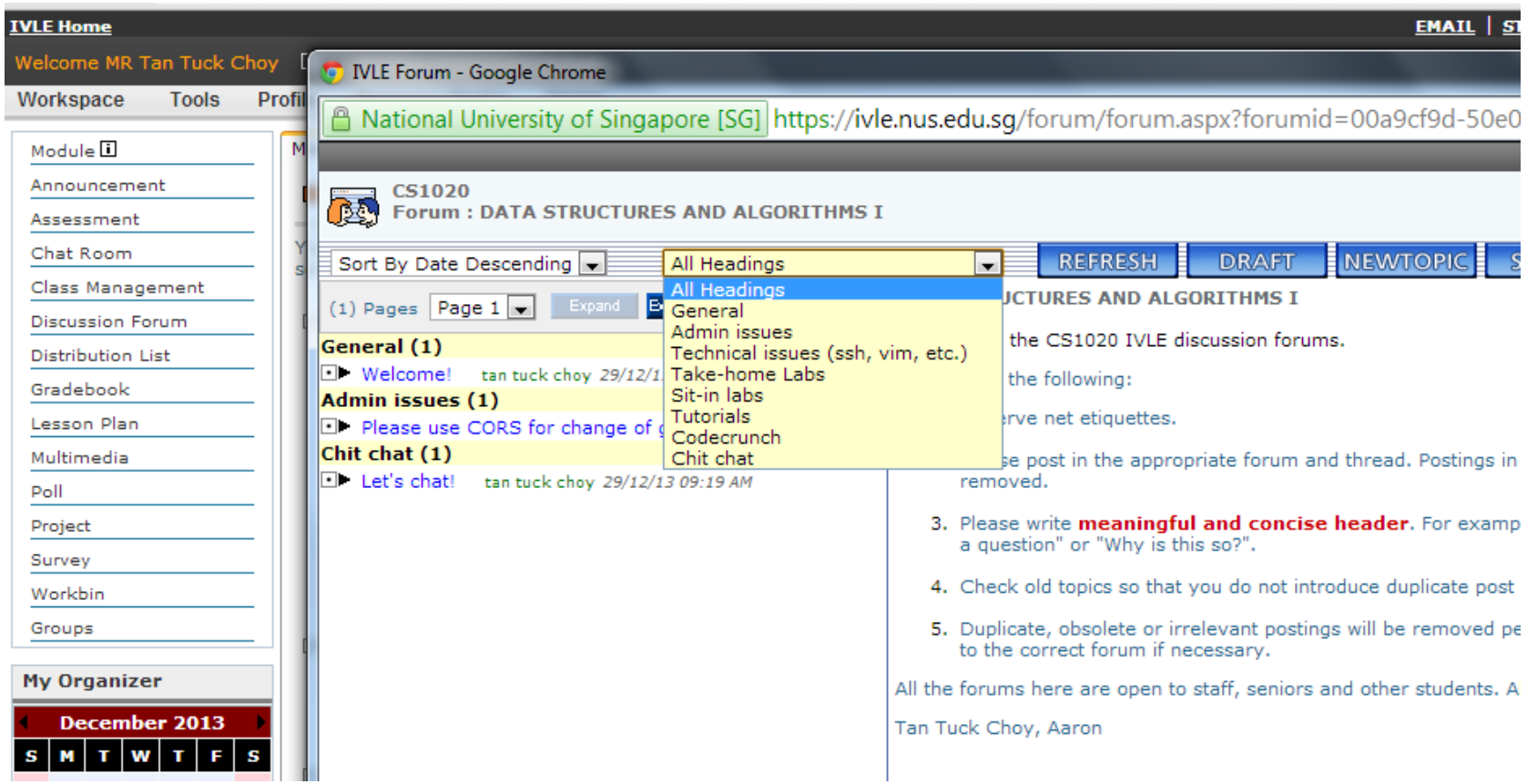
Hits since 26-Dec-11: 109719. Accesses today: 42. Statistics.

Resources

IVLE

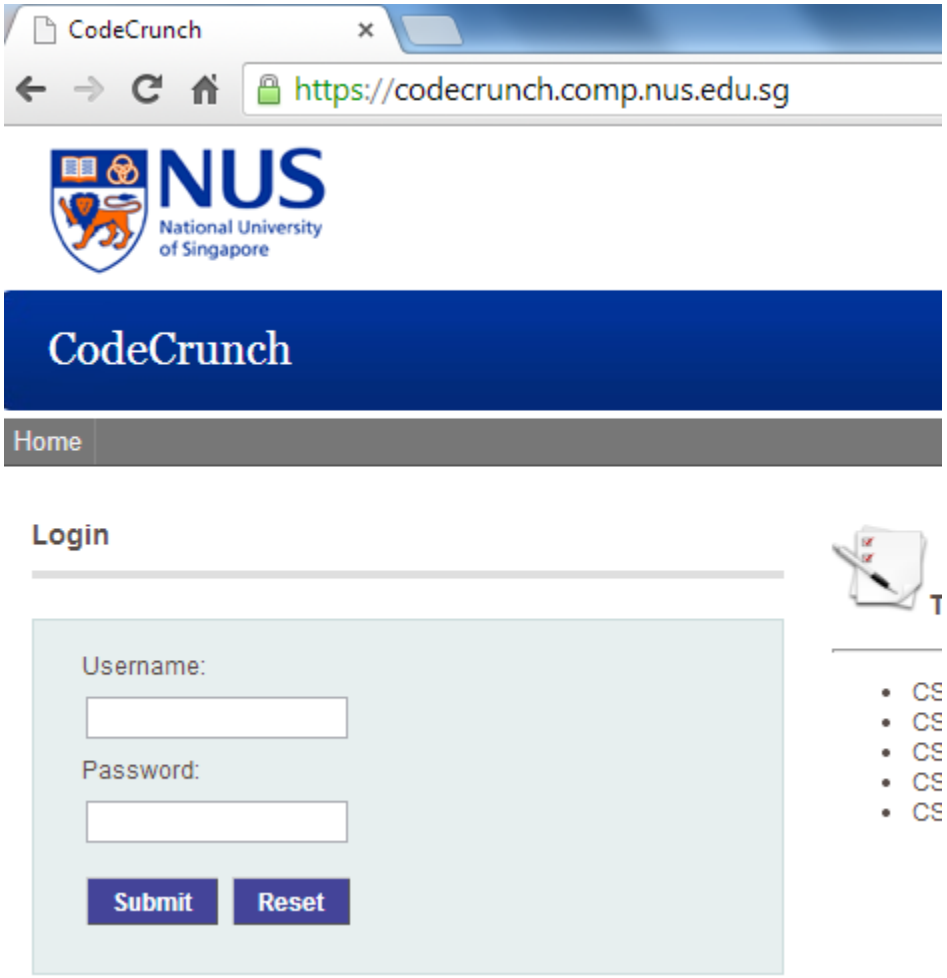
https://ivle.nus.edu.sg

- Announcements: Check daily
- Forums: Use appropriate heading when you post



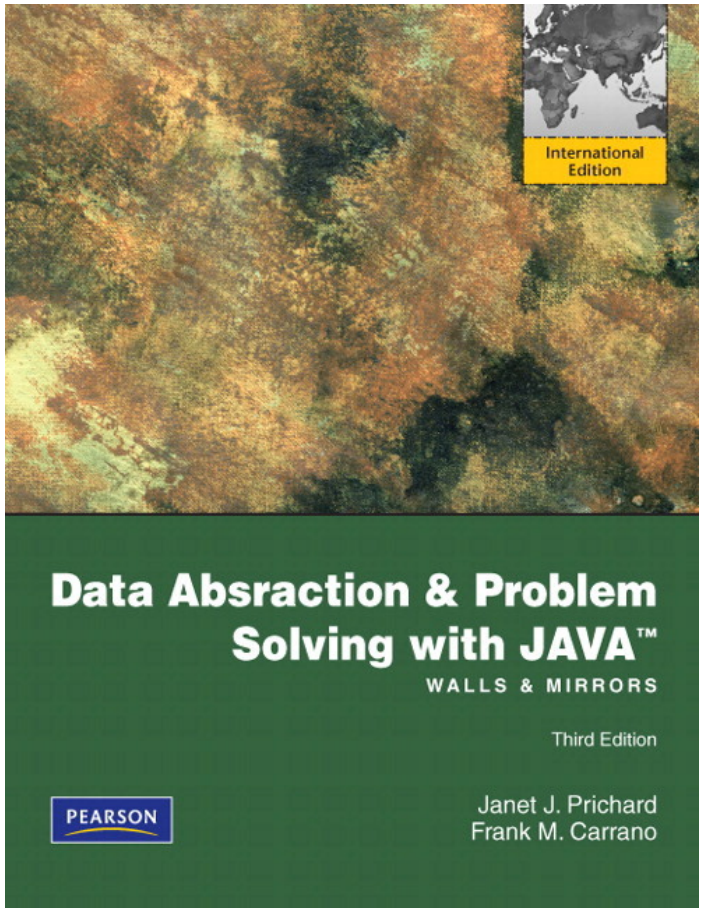
CodeCrunch

http://codecrunch.comp.nus.edu.sg

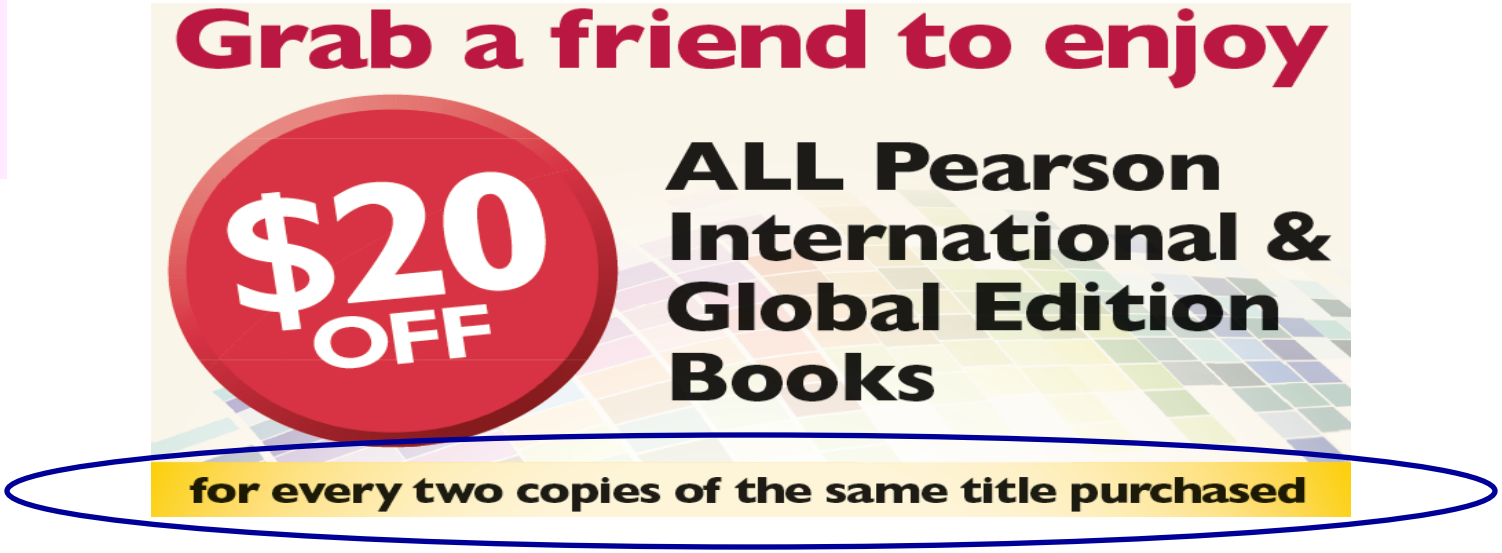


Textbook

- Data Abstraction and Problem Solving with Java: Walls and Mirror
  - International edition, 3rd ed
  - Authors: Janet J. Prichard and Frank M. Carrano
  - Publisher: Pearson
  - ISBN: 9780273751205
  - Available at NUS Co-op @ Forum
- Textbooks for loan
  - For needy students
  - Please refer to IVLE forum for details



Textbook



Promotion period:
11th to 15th January 2016.

Schedules

http://www.comp.nus.edu.sg/~cs1020/1_module_info/sched.html

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AY2015/6 Semester 2
Module Information - Schedules

[Calendar | NUS Class Time-Table | Lesson Plan | Lecture Schedule | Tutorial Schedule | Lab Schedule | Important Events]

Calendar

January 2016

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1	2
	3	4	5	6	7	8	9
1:	10	11	12	13	14	15	16
2:	17	18	19	20	21	22	23
3:	24	25	26	27	28	29	30
4:	31						

February 2016

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
4:		1	2	3	4	5	6
5:	7	8	9	10	11	12	13
6:	14	15	16	17	18	19	20
:	21	22	23	24	25	26	27
7:	28	29					

March 2016

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
7:			1	2	3	4	5
8:	6	7	8	9	10	11	12
9:	13	14	15	16	17	18	19
10:	20	21	22	23	24	25	26
11:	27	28	29	30	31		

April 2016

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
11:						1	2
12:	3	4	5	6	7	8	9
13:	10	11	12	13	14	15	16
:	17	18	19	20	21	22	23
:	24	25	26	27	28	29	30

For complete academic calendar, see NUS calendar.
Recess week: 20 - 28 Feb.
Public holidays: 1 Jan (New Year Day), 8 - 9 Feb (CNY), 25 Mar (Good Friday).
CS1020 Exam: **3 May 2016, Tuesday, 1-3pm.** (See Examination → Time-Table, Semester 2, AY2015/6)

Assessments: Overview

http://www.comp.nus.edu.sg/~cs1020/1_module_info/desc.html

- There will be 6 take-home labs (inclusive of lab #0), 4 graded sit-in labs and a practical exam (PE).
  - Take-home labs and sit-in labs are held in alternate weeks. Sit-in labs are open-book but electronic devices (eg: labtops and thumb-drives) are not allowed.

Activities	Weightages
Tutorial attendance/participation	5%
Lab attendance	2%
Take-home labs	5%
Sit-in labs	18%
Practical exam	15%
Mid-term Test	15%
Final Exam	40%

- Tutorials and labs start in week 3
- Mid-term test and final exam are closed-book (no cheat sheet allowed)

Laboratory sessions

- See module website for updates
- Actual lab session starts from week 3
  - A special lab #0 (1%) will be released in week 1
    - Familiarize yourself with the UNIX system and vim
- Two types of lab session:
  - **Take-home labs**
    - 5 sessions (best 4 out of 5 sessions; total = 4%)
    - Total: 4% + 1% (lab #0) = 5%
  - **Sit-in labs**
    - 4 sessions, 6% per session
    - Total: 18% (Best 3 out of 4 sessions)

Take-home Labs

- 6 take-home labs (including lab #0)
- Released on CodeCrunch
  - Each lab consists of 3 exercises
  - You should attempt them before attending the lab
  - Only one of them will be graded
- During the lab session, your lab TA will:
  - Discuss possible approaches
  - Cover additional syntax (if any) or other related exercises/topics
  - Lab attendance: 2%
- Each take-home lab (except lab #0) is worth 1%
  - Must be submitted to CodeCrunch BEFORE deadline
  - Must obtain an 'A' for the graded exercise.

Sit-in Labs

- There are 4 sit-in labs
- A sit-in lab is like a mini practical exam to test your **programming skills**
- Each sit-in lab is:
  - 1 hour 40 minutes in duration and **worth 6%**
  - Open book, but limited to printed material only
  - API will be available on the computer
- Your best 3 sit-in labs out of 4 will be chosen
  - **Total: 18%**
- You will be allowed to take a makeup only if
  - You missed 2 or more sit-in labs with valid medical certificates or official excuses

Sit-in Labs: Marking Scheme (1/2)

- Correctness: 70 marks
  - Input: 10% (Correctly read in all input and used them)
  - Output: 10% (Output format only, not about correct result)
  - Correctness: 50% (partial credit will be given)
- Programming style: 30%
  - Modularity: 10%
  - Meaningful comments: 10%
    - Particulars
    - A description for each user-defined method
    - Appropriate pre- and post-conditions
    - Other comments to explain complex codes
  - Meaningful/descriptive identifiers: 5%
  - Proper indentation: 5%
- Programming Style marks will be given only if you score at least 20 marks for correctness.

Sit-in Labs: Marking Scheme (2/2)

- Penalties:
  - 50% will be deducted if the submitted program has syntax error.
  - Commented codes are ignored in general.

Practical Exam

- Date: 2nd April
- Time: 10am to 3pm
- Venue: PL labs in COM1 basement
- Open-book, similar to sit-in labs
- Marking scheme is the same as sit-in labs

Lab Schedules (Tentative)

Plan is tentative. Refer to module website for the most up-to-date plan.

Week	Date	Type	Topics
1	14th Jan	*Special*	Intro Workshop
1	--	Take-home #0	Basic Java/IO
3	28th Jan	Take-home #1	Basic Java/Array
4	**4th Feb**	**Sit-in #1**	**Basic Java/Array**
5	11th Feb	Take-home #2	OOP
6	**18th Feb**	**Sit-in #2**	**OOP**
7	3rd Mar	Take-home #3	Linked List
8	**10th Mar**	**Sit-in #3**	**Linked List**
9	17th Mar	Take-home #4	Stack/Queue
10	**24th Mar**	**Sit-in #4**	**Stack/Queue**
11	31st Mar	Take-home #5	PE Practice

Assumptions

Or what we assume you should have learned in CS1010/CS1010J/CS1010S/CS1101S

Topics in C / Java / Python / Javascript

Program development

- Writing pseudocodes
- Edit – compile – execute" cycle
- Step-wise refinement
- Hand-tracing codes
- Incremental coding
- Testing
- Debugging

Problem solving

- Class exercises
- Practice exercises
- Lab assignments

Programming environment/tools

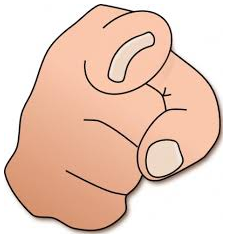
- Operating system: UNIX
- Editor: vim
- Debugger: (eg: gdb)

Summary and advice (1/2)

- The labs focus more on your programming skills:
  - Ability to translate idea into actual program
- Midterm and final exam focus more on your problem-solving skills:
  - Ability to understand and reason about the problem
  - Ability to apply your knowledge to formulate solution
- You need to spend time on:
  - Actually coding to improve your skill
  - Thinking deep and exploring as memorization does not help
  - Asking questions! (Use the IVLE forums.)

Summary and advice (2/2)

- We provide you
  - Practice exercises on CodeCrunch
  - Self-assessments (quizzes) on IVLE
  - Help sessions (on request)
- *But, ultimately…*



must be prepared and willing to

put in a lot of efforts!

Introductory Workshop

- Those of you who have taken CS1010/CS1010J are familiar with UNIX system and vim.
- For those who did not take the above and hence are unfamiliar with UNIX and vim, please attend an Intro Workshop on 14th January, Thursday, at PL2 (COM1 basement)
  - Session 1: 10am – 11:40am
  - Session 2: 12nn – 1:40pm
  - Session 3: 2pm – 3:40pm
- Please refer to IVLE forum “Intro Workshop” and sign up there

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