
CS1020 Data Structures and Algorithms I

Lecture Note #0

Course Admin

(AY2015/6 Semester 2)

Outline

Module Overview

Objectives

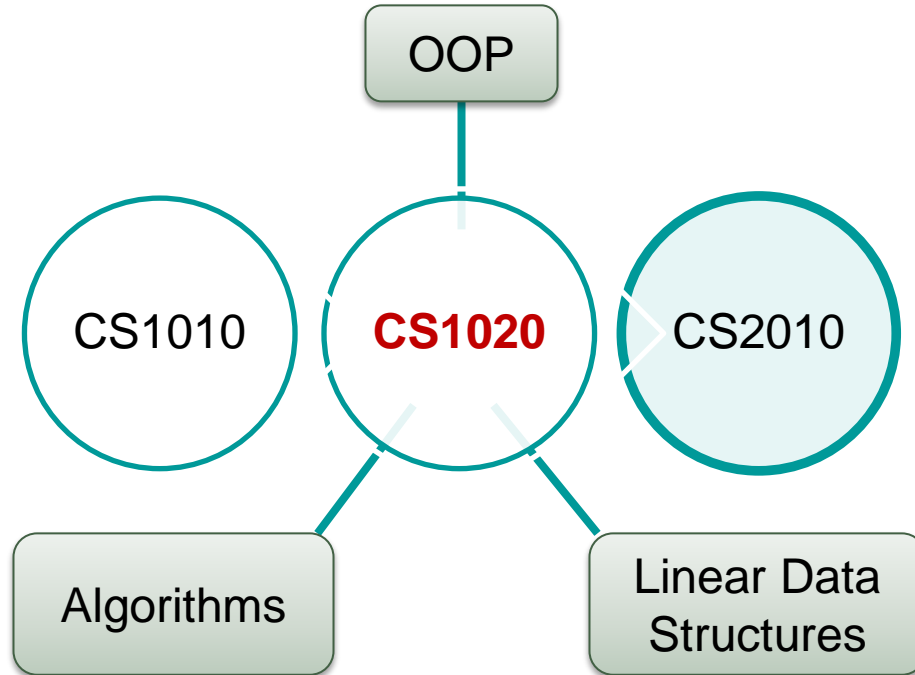
Staff

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

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- ❑ **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](#)

- Welcome to CS1020! (AY2015/6 Semester 2)
- Important links:
 - [Java API Specification Edition 7](#)

Resources...

[Books](#)
[Online](#)
[Lectures](#)
[Errata](#)

- This website is currently being updated for the coming semester. More information will be updated progressively. Thank you.

CA...

[Tutorials](#)
[Takehome-Labs](#)
[Sitin-Labs](#)
[Term Tests](#)
[Exams](#)
[CA Marks](#)

Hits since 26-Dec-11: 109719. Accesses today: 42. [Statistics](#).

Misc...

[Practice Ex](#)
[CS1010 Stuffs](#)



IVLE

<https://ivle.nus.edu.sg>

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

The screenshot shows the IVLE Home page on the left and a forum thread for CS1020 on the right. The forum thread is titled "CS1020 Forum : DATA STRUCTURES AND ALGORITHMS I". It shows a list of posts with a dropdown menu open for "All Headings". The dropdown menu lists: General, Admin issues, Technical issues (ssh, vim, etc.), Take-home Labs, Sit-in labs, Tutorials, Codecrunch, and Chit chat. The forum thread also includes a "My Organizer" section for December 2013 and a list of rules for posting.

IVLE Home
Welcome MR Tan Tuck Choy
Workspace Tools Profil

Module **I**
Announcement
Assessment
Chat Room
Class Management
Discussion Forum
Distribution List
Gradebook
Lesson Plan
Multimedia
Poll
Project
Survey
Workbin
Groups

My Organizer
December 2013
S M T W T F S

IVLE Forum - Google Chrome
National University of Singapore [SG] <https://ivle.nus.edu.sg/forum/forum.aspx?forumid=00a9cf9d-50e0>

CS1020
Forum : DATA STRUCTURES AND ALGORITHMS I

Sort By Date Descending
(1) Pages Page 1 Expand

All Headings
All Headings
General
Admin issues
Technical issues (ssh, vim, etc.)
Take-home Labs
Sit-in labs
Tutorials
Codecrunch
Chit chat

General (1)
Welcome! tan tuck choy 29/12/13

Admin issues (1)
Please use CORS for change of

Chit chat (1)
Let's chat! tan tuck choy 29/12/13 09:19 AM

DATA STRUCTURES AND ALGORITHMS I
the CS1020 IVLE discussion forums.
the following:
serve net etiquettes.
post in the appropriate forum and thread. Postings in
removed.
3. Please write **meaningful and concise header**. For examp
a question" or "Why is this so?".
4. Check old topics so that you do not introduce duplicate post
5. Duplicate, obsolete or irrelevant postings will be removed pe
to the correct forum if necessary.
All the forums here are open to staff, seniors and other students. A
Tan Tuck Choy, Aaron



CodeCrunch

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

The screenshot shows a web browser window with the title 'CodeCrunch' and the URL 'https://codecrunch.comp.nus.edu.sg'. Below the browser window is the NUS (National University of Singapore) logo. The main content area has a dark blue header with 'CodeCrunch' in white text. Below this is a 'Home' link. The 'Login' section contains a light blue box with the following elements:

- Username:
- Password:
-
-

To the right of the login box is a small icon of a notepad and pen, and a list of links, each preceded by a bullet point:

- CS
- CS
- CS
- CS
- CS

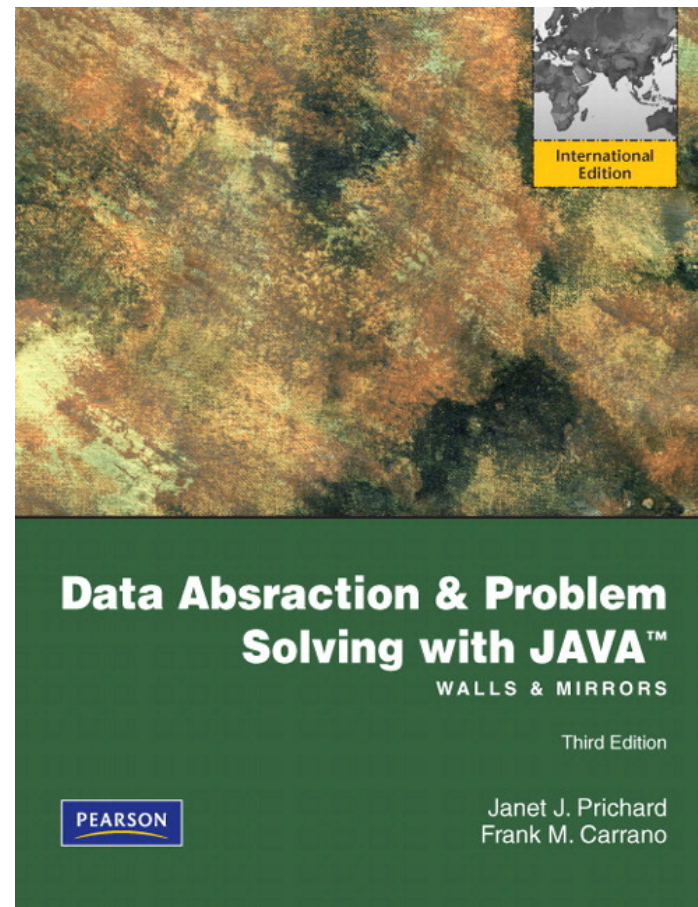
Textbook

■ 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

Grab a friend to enjoy



**ALL Pearson
International &
Global Edition
Books**

for every two copies of the same title purchased

Promotion period:
11th to 15th January 2016.

Schedules

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



Module Info...

[Description](#)
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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](#)]

Resources...

[Books](#)
[Online Lectures](#)
[Errata](#)

Calendar

CA...

[Tutorials](#)
[Takehome-Labs](#)
[Sitin-Labs](#)
[Term Tests](#)
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[CA Marks](#)

Misc...

[Practice Ex](#)
[CS1010 Stuffs](#)

January 2016							February 2016						
Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2	4:	1	2	3	4	5	6
3	4	5	6	7	8	9	5:	7	8	9	10	11	12
10	11	12	13	14	15	16	6:	14	15	16	17	18	19
17	18	19	20	21	22	23	:	21	22	23	24	25	26
24	25	26	27	28	29	30	7:	28	29				
31													
March 2016							April 2016						
7:		1	2	3	4	5	11:				1	2	
8:	6	7	8	9	10	11	12:	3	4	5	6	7	8
9:	13	14	15	16	17	18	13:	10	11	12	13	14	15
10:	20	21	22	23	24	25	:	17	18	19	20	21	22
11:	27	28	29	30	31		:	24	25	26	27	28	29

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

Programming environment/tools

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

Problem solving

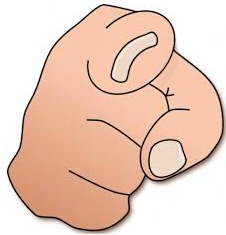
- ❖ Class exercises
- ❖ Practice exercises
- ❖ Lab assignments

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...*



YOU 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

End of file
