

COMP 5112

Data Structures and Database Systems

Fall 2024

Kevin K.F. Yuen, PhD

Contact Information

	Instructor	TAs
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- ◆ You are welcome to contact me by **email**
- ◆ Please make an appointment by email if you wish to have face-to-face meeting
- ◆ More information about me
 - ◆ <https://scholar.google.com/citations?user=RplbAGsAAAAJ>
 - ◆ My research area: Data Sciences, Decision Analytics, Machine Learning, Operational Research

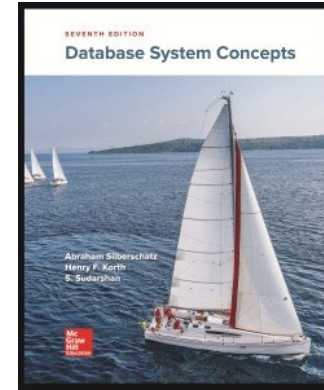
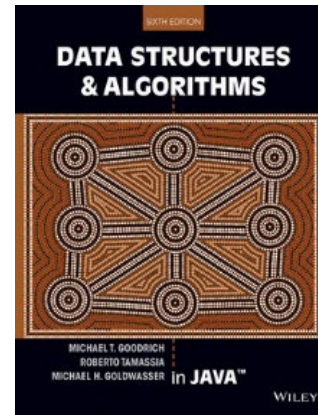
Readings

◆ Textbooks

- ◆ M.T. Goodrich and R. Tamassia, **Data Structures and Algorithms in Java**, 6th Edition, John Wiley, 2014.
- ◆ A Silberschatz, H.F. Korth, S. Sudarshan. **Database System Concepts**, 7th Edition. McGraw Hill, 2019.

◆ You are encouraged to read the corresponding textbook chapter after each class

◆ **Acknowledgement**: The teaching materials were contributed by Prof. Ken Yiu. Minor changes may be made and indicated.



Why do we study this course?

- ◆ Help you do some tasks in other MSc subjects
- ◆ *Example 1: process a file about restaurants*
 - ◆ Which data structure(s) should be used in my program?
 - ◆ How to search a restaurant by name?
 - ◆ How to find the top-10 restaurants (in terms of score)?
- ◆ *Example 2: develop a shopping website*
 - ◆ How to use a database system (e.g., Oracle, MySQL)?
 - ◆ How to design the schema for my database?
 - ◆ How to write SQL statements for my website?

Week	Tue Class	Wed Class	Lecture Sequence	Lab /Tutorial Sequence	Venue (Tue Class)	Venue (Wed Class)
1	Sep. 3	Sep. 4	1) Introduction to Data Structures	Lab 1: Start with Java	N001	PQ306
2	Sep. 10	Sep. 11	2) Linear Data Structures	Lab 2: LinkedList	N001	PQ306
3	Sep. 17	Sep. 18	3) Tree Data Structures	Lab 3: Tree Data Structures	N001	PQ306
4	Sep. 24	Sep. 25	4) Heap and Heap-Sort	Lab 4: Heap	6:30-7:30: N001; 7:30-9:30: PQ 604ABC	PQ306
5	Oct. 1	→ Oct. 2	5) Sorting Algorithms	Lab 5: Sorting	N001-(move to Wed class or online, or watch video recording later)	PQ 604ABC Or Online
6	Oct. 8	Oct. 9	6) Introduction to Database Systems [Quiz 1]		N001	PQ306
7	Oct. 15	Oct. 16	7) Relational model	Lab 7: Relational Model	N001	PQ306
8	Oct. 22	Oct. 23	8) SQL I		N001	PQ306
9	Oct. 29	Oct. 30	9) SQL II	Labs 6, 8 & 9: SQL	6:30-7:30: N001; 7:30-9:30: PQ 604ABC	PQ 604ABC
10	Nov. 5	Nov. 6	10) Entity-relationship model	Lab 10: E-R Diagrams	N001	PQ306
11	Nov. 12	Nov. 13	11) Database normalization	Lab 11: Database normalization	N001	PQ306
12	Nov. 19	Nov. 20	12) Data storage and indexing	Lab 12: Storage and indexing	N001	PQ306
13	Nov. 26	Nov. 27	13) Query processing [Quiz 2]	Lab 13: Query processing	N001	PQ306

Due to Public Holiday: No Class

Course Materials

- ◆ <https://learn.polyu.edu.hk/>
- ◆ Please check *Blackboard* regularly!
 - ◆ Announcement
 - ◆ Lecture slides
 - ◆ Tutorial / lab exercises
 - ◆ Assignments & quizzes
 - ◆ Solutions

Assessment

- ◆ Quiz 1 (15%), Quiz 2 (15%)
- ◆ Assignment 1 (12.5%), Assignment 2 (12.5%)
- ◆ Final Exam (45%)

- ◆ More about quizzes
 - ◆ Each quiz takes 45 minutes
(more details later)

Grading Policy

◆ Late policy:

- ◆ Your responsibility: start early & submit assignment on time!
- ◆ i days late: $(20*i)\%$ discount on your marks (0:01 – 23:59 hours means one day late on the basis of System Time)
e.g., 1 day late → 20% discount

◆ Guidelines on collaboration

- ◆ Write up the assignments on your own
- ◆ If you discuss with your classmates on assignments, make sure you throw away written work from the discussion

◆ Zero tolerance on plagiarism

- ◆ Software will be used to detect plagiarism cases!
- ◆ Serious cases will be reported to PolyU

Reminder

- ◆ **Try to spend time and effort in this course!**
- ◆ Tell me early when you have questions
(in lectures / tutorials / assignments / quizzes)
- ◆ Please do not disturb others during the class
 - ◆ When you get a phone call, please answer it outside the classroom

How do you learn better?

- ◆ In each lecture (2 hours)
 - ◆ Get the main ideas and concepts
 - ◆ Try to be active and think about my questions
- ◆ In each tutorial / lab (1 hour)
 - ◆ Practise exercises
 - ◆ Don't be shy to ask for help

A quote from <https://www.keepinspiring.me/benjamin-franklin-quotes/>

Tell me and I forget.

Teach me and I remember.

Involve me and I learn.

How to perform better

“When we are in the bottom of the mountain, we think the mountain is so high. However, don't scare. When we reach the top of mountain, we will find the ground is so small!

Next, we will challenge the higher mountain. Don't hesitate! Just go ahead!”



不聞不若聞之，
聞之不若見之，
見之不若知之，
知之不若行之。
學至於行之而止矣。
行之，**明**也。

-- 《荀子·儒效》

(不若:不如, not better than)

I hear and I forget.

I see and I remember.

I **do** and I **understand**.



In is the only way out!

向內是唯一的出路 -- An Indian Yogi

Let's start our journey!



and enjoy