CS101 Algorithms and Data Structures

Fall 2018

ShanghaiTech University

Course Info

- Instructors
  - Yuyao Zhang zhangyy8@shanghaitech.edu.cn
  - Dengji Zhao zhaodj@shanghaitech.edu.cn
- TAs
  - 11 TAs (4 Masters, 6 Year-4, 1 Year-3)
    - Masters: ZHANG Wen, ZHENG Yue, ZHENG Linfeng, ZHANG Yao
    - Year-4: WANG Letong, SHEN Yao, XU Weikai, YUAN Keyi, LV Shidong, XU Yintao
    - Year-3: WANG Youjia

Course Info

- Classes
  - Tue & Thu 8:15-9:55 (Week 1-16)
  - 教学中心201
- Review/Quizzes/Discussions
  - Format: four groups, 45 students each (Week 2-16)
  - Length: 90mins per week per group
  - Location and Time: TBA
  - Instructors: all TAs
  - Contents: review of lectures, quizzes, and discussions

Course Info

- Piazza Course Forum
  - http://piazza.com/shanghaitech.edu.cn/fall2019/cs101
  - You are encouraged to ask questions and participate in discussions
  - Course schedule, slides, office hour etc. are published on the forum
  - Invitation has be sent to your ShanghaiTech email (haven't received it?)
- Office Hours
  - Location and Time: see course forum

Course Info

- Reference Book
  - Introduction to Algorithms (3rd ed.). Cormen, Thomas H., Leiserson, Charles E., Rivest, Ronald L., Stein, Clifford. MIT Press. ISBN 9780262033848.

Course Schedule

Week	Date	Content
1	Tue	Introduction
	Thu	Array and Lists
2	Tue	Stack and Queue
	Thu	Sorting: Insertion, Bubble
3	Tue	Big O/Theta/Omega
	Thu	Trees: Introduction, DFS, BFS
4	Tue	
	Thu	
5	Tue	Binary Trees
	Thu	Heap and Heap Sort
6	Tue	Binary Search Trees
	Thu	Balanced Binary Search Trees: AVL
7	Tue	Disjoint Sets
	Thu	Graphs: Intro, Traversal
8	Tue	Minimum Spanning Trees
	Thu	Topological Sorts
9	Tue	Shortest Path Alg: Dijkstra/A*
	Thu	Middle Term Exam

Course Schedule

10	Tue	Hash Table
	Thu	Divide and Conquer
11	Tue	Sorting: Merge
	Thu	Sorting: Quick
12	Tue	Median of Medians
	Thu	Greedy Algorithms I
13	Tue	Greedy Algorithms II
	Thu	Dynamic Programming I
14	Tue	Dynamic Programming II
	Thu	NP Completeness I
15	Tue	NP Completeness II
	Thu	Applications I
16	Tue	Applications II
	Thu	Review

Course Policy

- Grading
  - Exams (45%): middle term: 25%; final: 20%
  - Weekly Homework (20%): non-programming questions
  - Programming Tasks (20%): 4-5 programming tasks (each lasts 3 weeks)
  - In-Class Quizzes (15%): in lectures and discussions

Course Policy

- Plagiarism
  - All assignments must be done individually
    - You cannot copy directly from any other source
    - You cannot share solutions with any other students
    - Plagiarism detection software will be used on all the assignments
  - Ways of collaboration
    - You may discuss together or help another student such as debuging his or her code; however, you cannot dictate or give the exact solutions.

Course Policy

- Plagiarism
  - Punishment
    - When one student copied from another student, both students are responsible
    - Zero point on the assignment or exam in question
    - Disqualified from receiving any awards recommended by the school and from any competitive studying opportunities (e.g., international exchange)
    - Repeated violation will result in a F grade for this course as well as further punishment at the school/university level

Plagiarism: Example 1

- Alex and Bob were roommates
- Bob let Alex use his laptop to complete an assignment
- Alex copied Bob's solution for the assignment

Plagiarism: Example 2

- Leslie asked if Morgan could send her his code so that she could look at it (promising, of course, not to copy it)
- Morgan sent the code
- Leslie copied it and handed it in

Plagiarism: Example 3

- Garry and Harry worked together on a single source file initially and then worked separately to finish off the details
- The result was still noticeably similar with finger-print-like characteristics which left no doubt that some of the code had a common source

Plagiarism: Example 4

- Jordan uploaded the projects to GITHUB.com without setting appropriate permissions. Kasey found this site, downloaded the projects and submitted them. Both are guilty.
  - This applies to any public forum, news group, etc., not just gitub.com…

Real Plagiarism Examples

- Copied a peace of the codes from others or online repositories
- Copied someone's solution from his/her USB drive
- Copied a peace of others' codes and change all the variable/function names
- Unusual solutions appeared in different submissions