

The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a 3D appearance. They are located in the top-left, top-center, and bottom-right areas of the slide.

INTRODUCTION TO ALGORITHMS

LECTURE 0

XUE CHEN

2025 SPRING @ USTC

COURSE INFORMATION

- Textbook: ``Introduction to Algorithms''

(English Version) by Corman, Leiserson, Rivest, Stein [CLRS]

- Lecture Time (in 3A112):

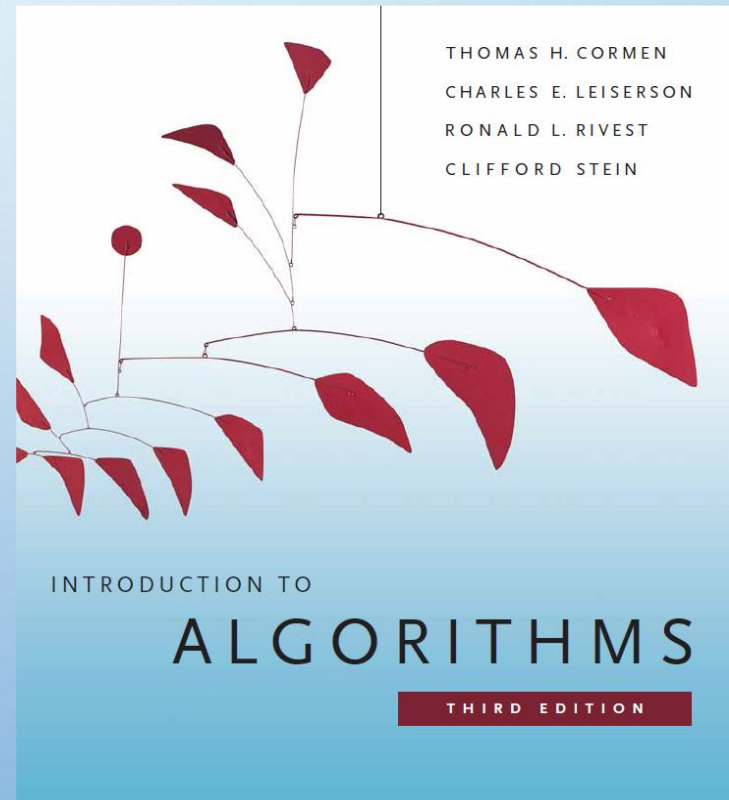
Tuesday (1,2) 07:50 – 09:25

Thursday (6,7) 14:00 – 15:35

from Week 1 to 15

- 3.5points

Hours: 60 (Theory) + 30 (Experiment)



WELCOME!

- Introduction to algorithms.
 1. How to design algorithms
 2. How to analyze algorithms
 3. How to solve practical problems (algorithmically)
- !!! Prerequisites: 程序设计，数据结构，组合数学，离散数学，图论（生成树、最大流最小割等），基础数论（质数、互素、同余等）
- Familiar with pseudo-codes, asymptotic notation (O , Ω , Θ), combinatorics $\binom{n}{n/2}$, graph theory, and basic probability theory.

INSTRUCTOR INFORMATION

- Instructor: Xue Chen

(xuechen1989@ustc.edu.cn & <http://staff.ustc.edu.cn/~xuechen1989/>)

Research in algorithms & theoretical CS: Randomized algorithms, computational complexity, learning theory, big-data algorithm, foundation of cryptography

- 4th time teaching this class

--- Tests and trials

--- Let me know if you have thoughts & comments

- TA: Yile Wang (XORTRUE@MAIL.USTC.EDU.CN)

Zhengting Bao (BZTMINAMOTO@MAIL.USTC.EDU.CN)

WEBSITES

- Homework (except experiments) and recourses will be available on bb.ustc.edu.cn
- WeChat group for discussion and annoucements

面对面建群：3112

- Feel free to Email me and TA for anything about this course and algorithms

start the subject with 算法基础：

GRADING POLICY

- Final 35% (cumulative)
- Midterm 30%: **either April 22 or 24**
- 35%: assignments & experiments
 - ≈8-9 assignments and 5-6 experiments in total
- Bonus (up to 10%): Attendance (signup, optional problems, Q&A, office hours...)
- THE INSTRUCTOR **RESERVES THE RIGHT TO MAKE ADJUSTMENTS** BASED ON A POSTERIORI EVALUATION OF THE RELATIVE DIFFICULTY OF THE EXAMS AND HOMEWORK (**UP TO 10% IN TOTAL, E.G., FINAL 40%, MIDTERM 30%, REST 30%**)

EXAMS

1. Semi-open **without books or electronic equipment**
2. 1-page A4 cheat sheet （1张A4小抄， 双面可用）
3. 5-6 algorithmic problems
4. Date will be announced 2 weeks before it --- no makeup exam
5. Very challenging usually



Assignments

- Typeset assignments (LATEX PREFERRED) and **submit them on bb.ustc.edu.cn** --- be graded 75% for correctness and 25% for clarity
- Clear pseudo-code; always justify your algorithms
- Arguments should be well-organized, and concise. Spell out main idea.
- Sanity check: spell out when you use known results in lecture/books and assumptions of the problem
- Experiments: OJ system --- **ANNOUNCE DETAILS SOON**

MORE ABOUT HOMEWORK



1. Some problems are challenging!
2. While you shall think about the problems on your own, you are encouraged to discuss in groups --- **write collaborators at the 1st page**
3. **MUST** write your own answers/codes. Homework that appears overly similar will be considered as **PLAGIARISM**
4. Late policy: 20% points are discounted for each 24 hours late (at most 48 hours)

POLICY ON CHEATING

Cheating includes:

- Google/Baidu for the solutions or ideas to the problem or related problems
- Use ChatGPT/DeepSeek/...
- Ask your classmates for solutions/codes
- Using icourse.club, github, . . . , to find back tests, old homework & solutions, etc.
- Uploading your solutions to the above sites or share your codes.
- Etc.

学术诚信

- 学术诚信是所有从事学术活动的学生和学者最基本的职业道德底线，本课程将不遗余力的维护学术诚信规范，违反这一底线的行为将不会被容忍。
- 作业完成的原则：署你名字的工作必须是你个人的贡献。作业允许事先讨论，要求是在开始文本和编程之前。但**关键想法的执行、以及作业文本和程序的写作必须独立完成**，并在作业中致谢（ACKNOWLEDGE）所有参与讨论的人。**不允许其他任何形式的合作**

——尤其是借阅已经完成同学的程序/答案 “参考”。

- **本课程将对剽窃行为采取零容忍的态度**。在完成作业过程中，对他人工作（出版物、互联网资料、其他人的作业等）直接的文本抄袭和对关键思想、关键元素的抄袭，按照 [ACM POLICY ON PLAGIARISM](#) 的解释，都将视为剽窃。剽窃者成绩将被取消。如果发现互相抄袭行为，**抄袭和被抄袭双方的成绩都将被取消。请主动防止自己的作业被他人抄袭。**
- 学术诚信影响学生个人的品行，也关乎整个教育系统的正常运转。为了一点分数而做出学术不端的行为，不仅使自己沦为一个欺骗者，也使他人的诚实努力失去意义。让我们一起努力维护一个诚信的环境。

勿以恶小而为之 勿以善小而不为

- 严禁**借阅**源代码与作业答案
- 严禁**提供**源代码与作业答案
- **严肃处理：抄袭者与被抄袭者皆判零分，多次作业违纪可能会造成平时分直接为0，所有提交的程序/答案都是作业的一部分**
- 允许交流思路，讨论解题技巧和编程方法
- 本课程不会容忍任何作弊行为，请**严肃对待**

TEACHING PLAN

- Intro: 0.5 week
- Sort: 1~1.5 weeks
- Divide & Conquer : 1~1.5 weeks
- Data Structures: 2 weeks
- Dynamic Programming: 1~1.5 weeks
- Greedy Method: 1~1.5 weeks ---- **Midterm Exam**
- Graph Algorithms (include disjoint sets and amortized analysis): 3.5~4 weeks
- String Algorithms: 1 week
- Number Theoretical Algorithm: 1~1.5 week
- Linear Program: 1~1.5 week
- Computation Complexity: 1.5 weeks



OFFICE HOUR



- Xue's office hour

Location: West Library Office 1410

Time: Tuesday 13:30~14:30 & Thursday 16:00~17:00 --- email for other appointments

- TAs' Office Hour: 10:30-11:30 & 18:30—19:30 (on Monday & Wednesday)

Location: 3Axxx --- announced every week (week 2 in 3A302)

- **!!! Office hours are a great asset to learning: questions about content, confused by problems, review exams, know your instructor and TAs,...**
- **Instructor and TA won't be able to reply WeChat/QQ on time**

QUESTION?