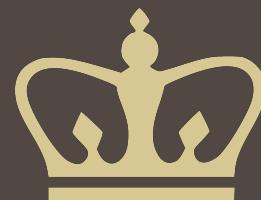


PROGRAMMING LANGUAGES & TRANSLATORS

Instructor: Baishakhi Ray

Fall 2020

Trivia



Instructor

Prof. Baishakhi Ray

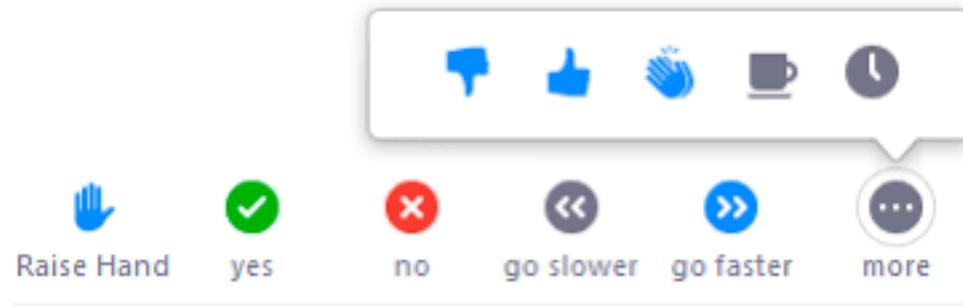
rayb@cs.columbia.edu

<https://rayb.info>

Office Hour: Wednesday 2:30am-3:30pm/by Appointment



-
-
- If you have any clarification question, please raise your hand in zoom



- You can also type your questions in zoom chat
 - I will take Q&A pause periodically and answer those questions

This Class

- Theory: Learn different phases of a compiler design
- Programming: Implement different phases of compilers
 - Implement modules on top of an existing compiler (Clang/LLVM)

	Lectures	Programming
1	Introduction	
2	Lexical Analysis	Prog1
3	Syntax Analysis	Prog2
4	Semantic Analysis	Prog3
5	Run-Time Environment	
6	Code Generation	Prog4
7	Optimization	Prog5, Prog6

Theory deliverables:

- Written assignments
- Midterm
- Final

Programming deliverables:
6 prog assignments

All are individual assignments

Assignments and Grading

• Programming Assignments	40%
• Written Assignments	10%
• Midterm	25%
• Final	25%
• Extra Credit	10%

- Programming assignments are most important, but most students do well on it. Grades for tests often vary more.

Extra Credit:

- 10% of earned (extra credit/total extra credit) will be added with the original 100% from other assignments/exams
 - If you earn 50 out of 100 in extra credit, 5 will be added with your total (100%) achievement.

Assignments Policy

- Hard Deadline

- There will be no extension unless you produce medical certificate or permission from school authorities
- The instructor or TAs will not reply to such email requests.
- Plan ahead so that you can finish the assignments on time.
 - There can be challenges that you have not anticipated

- Written Assignments will be submitted through Gradescope

- Find Gradescope entry code in Piazza
- Type your submission

- Programming Assignments will be submitted through Github Classroom

- TAs will send you detailed instructions

Assignments Policy

- Work individually
- Programming assignments: work individually.
 - You can discuss with TAs/Instructor/Classmate
- Written assignments: do by yourself.
 - No discussion
 - Only clarification questions are allowed on Piazza
 - TAs/Instructors will not respond to individual email

Exam Policy

- **Exams: Open book**
 - We will open the exam for the whole day.
 - Once you start the exam, you have to finish within fixed hours.
 - Follow CU honor code.
- **In-Class Participations**
 - Class participation is important
 - Instructor will ask questions that you have to answer using PollEverywhere in real-time
 - Go to <https://pollev.com/plt4115> for participations

Prerequisites

- Make sure the students are prepared with C/C++ (**required**)
- Computer Organization/Architecture (**recommended but not required**)
- Theory of Computation beneficial (**recommended but not required**)
- Classes you are expected to know (**recommended but not required**)
 - COMS W3157 Advanced Programming
 - How to work on a large software system in a team
 - Makefiles, version control, test suites
 - Testing will be as important as coding
 - COMS W3261 Computer Science Theory
 - Regular languages and expressions
 - Context-free grammars
 - Finite automata (NFAs and DFAs)

Submission Policy

Don't be a cheater (e.g., copy from each other).
If I catch you cheating I will send you to the dean.

Schedule

- Lectures:
 - Mondays and Wednesdays, 1:10 PM-2:25 PM @ Zoom
 - September 9 – December 9

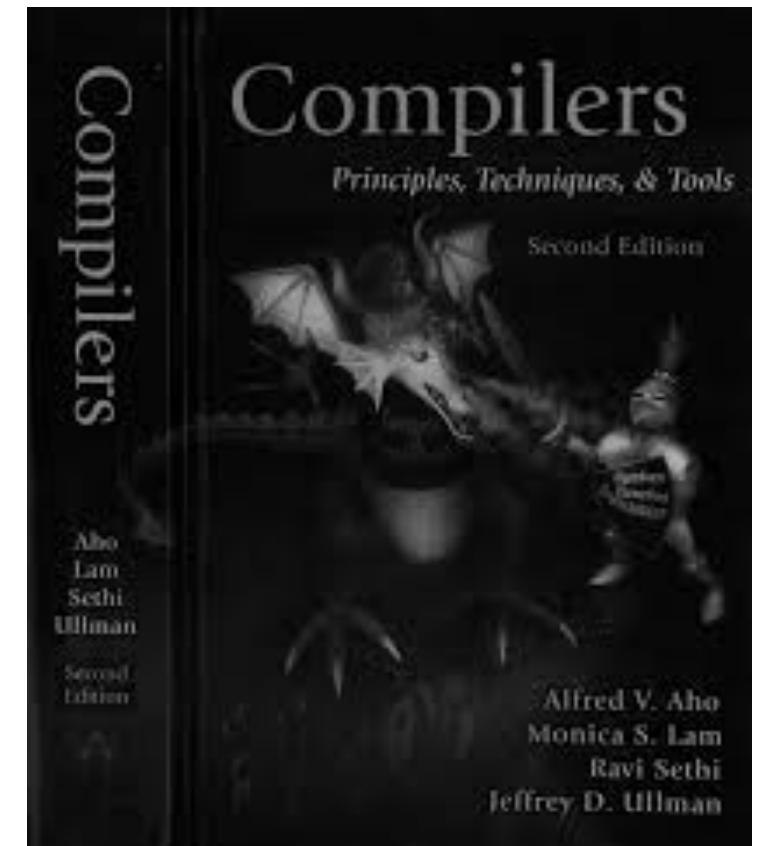
- Exams:
 - Midterm : October 21
 - Final: December 9

Submission Links

- **Written Assignments** : [gradescope](#)
(Entry Code will be posted in Coursework and Piazza)
- **Programming Assignments** : [github classroom](#)
(Details will be posted in Coursework and Piazza)
- **In-class participations** : [PollEverywhere](#)
(Details will be posted in Coursework and Piazza)

Recommended Text

- Compilers: Principles, Techniques, and Tools
 - By Alfred V. Aho, Monica S. Lam, Ravi Sethi, and Jeffrey D. Ullman.
 - 2nd Edition
 - Addison-Wesley, 2006
- Research Papers
 - Distributed by the instructor



Q&A

TA

- Saikat Chakraborty (Mondays & Thursdays 11 AM-12:00 PM EST)
- Aditya Sridhar (Tuesdays & Thursdays 4:30-5:30 PM EST)
- Quanxing Liu (Fridays 10 AM-12:00 PM EST)

Programming Assignments

- 6 programming assignments
- We should have a good knowledge of C/C++
- Last 5 assignments will be done on top of LLVM infrastructure
 - LLVM is a state-of-the art compiler
 - If you are using MAC, you are probably using LLVM compiler
- Each student will be provided with google cloud resource from the 2nd programming assignment.

Programming Assignments

- In all the assignments, some partial code will be given.
- Based on the instructions, you have to finish the rest.
- Scripts to setup the environment and run the code will also be provided.
- Each assignment will come with a bunch of test cases
 - Your goal is to pass all the test cases.
 - However, passing all the test cases do not mean the program is correct.
- Submit all programming assignments through GitHub Classroom.

GitHub Classroom Demo

Q&A