CSC 212: Data Structures and Abstractions

Introduction

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[credit Marco Alverez]

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University of Rhode Island

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THINK BIG WE DO℠

Welcome !

- Lectures
  - TR 11:00 - 12:15p @ White Hall Room 205
- Labs
  - W 12 - 1:45p @ Library Room 166
  - F 10 - 11:45a @ Library Room 166
- Team
  - Jonathan Schrader, **Instructor**
  - Christian Esteves, **Lead TA**
  - Calvin Higgins, Daniel Diaz Pereyra, Vincent Zhuang, **TAs**
- Course Technology
  - Github, EdStem, Gradescope

CSC 212?

- Review of basic principles of analysis of algorithms
- Introduction to fundamental data structures and their algorithms
  - ✓ arrays, lists, stacks, queues, trees, hash tables, graphs
- Survey of classic algorithms for sorting and searching

Prerequisites: CSC 211 (at least C-) and MTH 180

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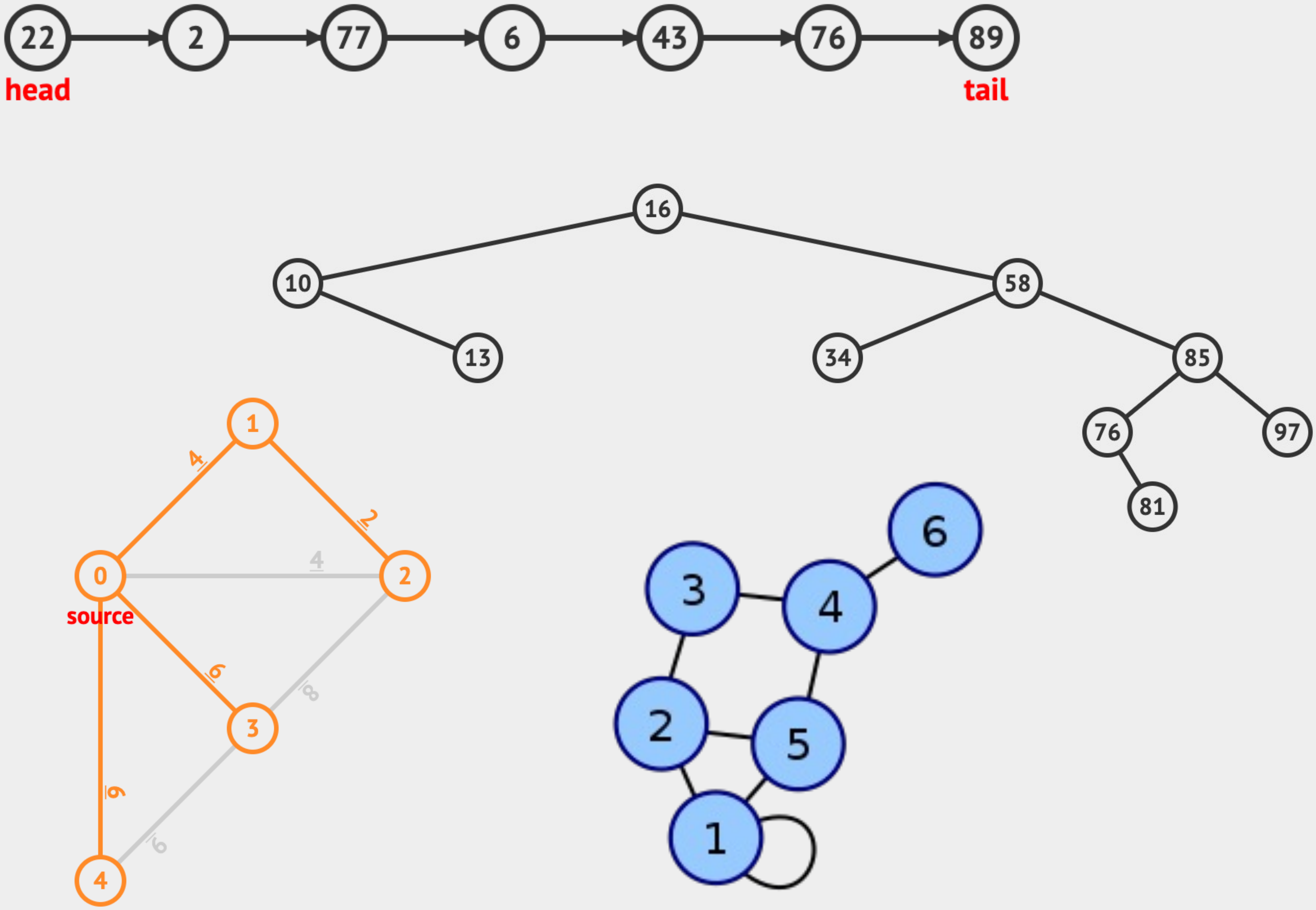
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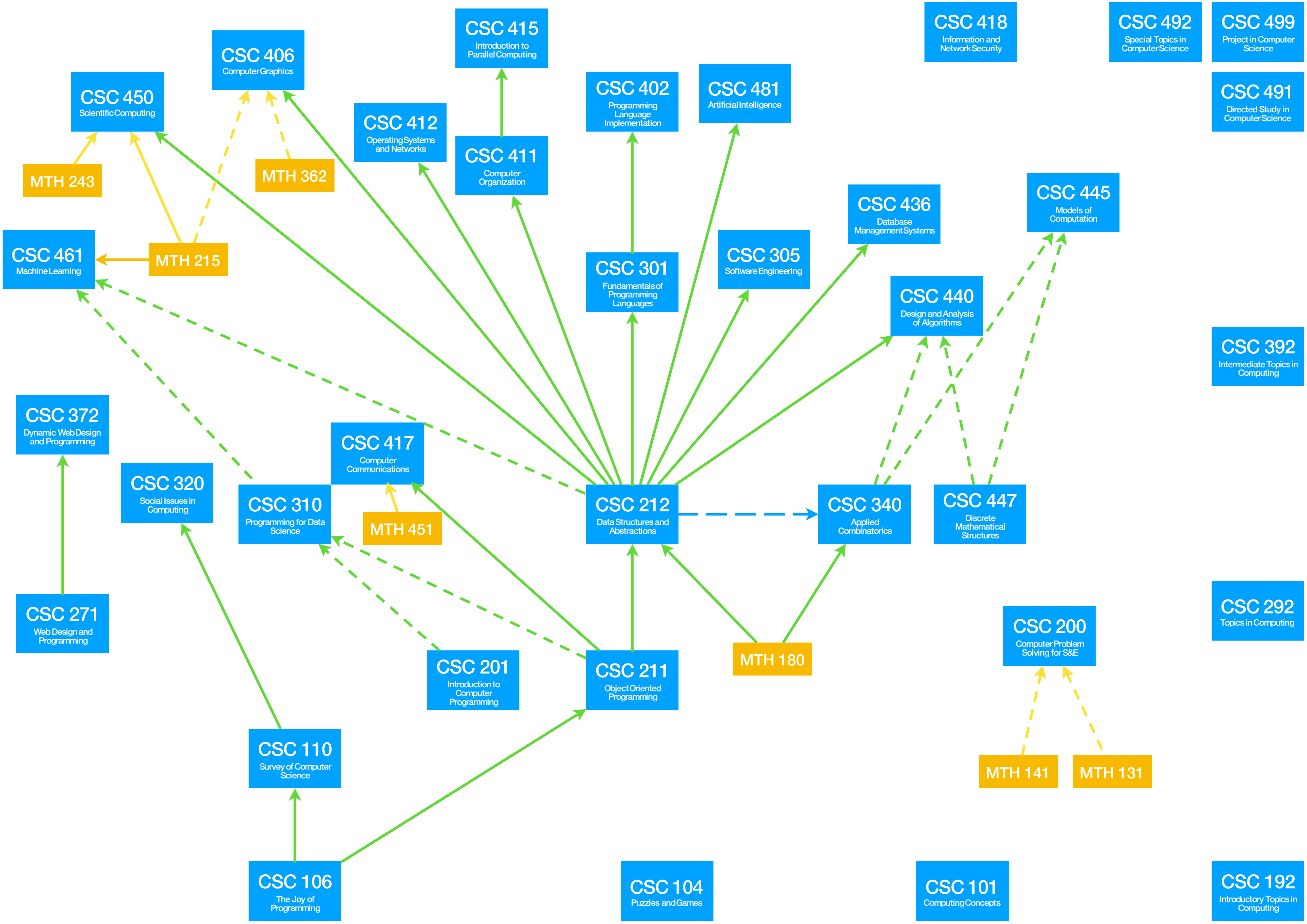
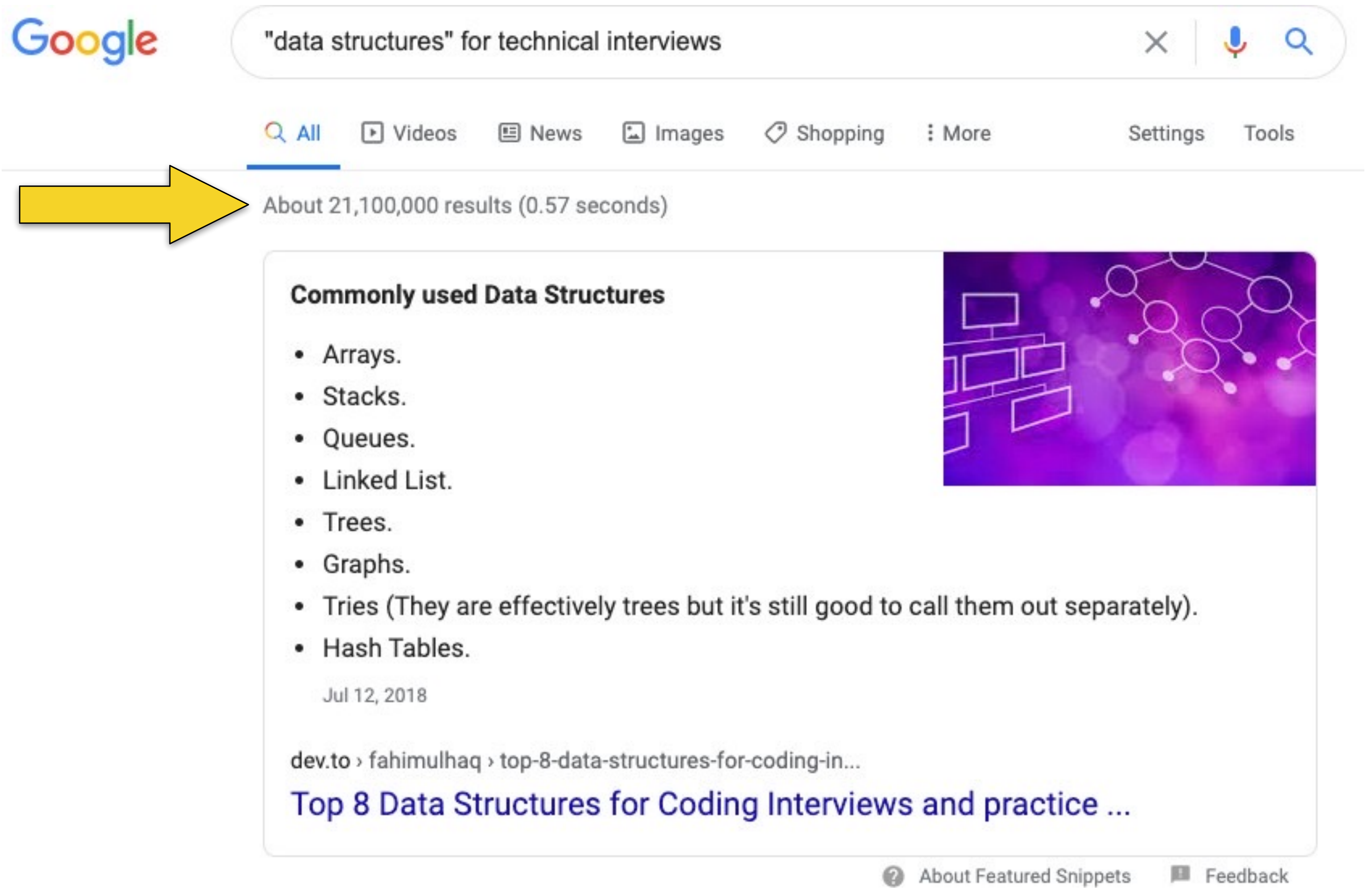

CSC 406
Computer Graphics
CSC 415
Introduction to Parallel Computing
CSC 418
Information and Network Security
CSC 492
Special Topics in Computer Science
CSC 499
Project in Computer Science
CSC 450
Scientific Computing
CSC 412
Operating Systems and Networks
CSC 402
Programming Language Implementation
CSC 481
Artificial Intelligence
CSC 491
Directed Study in Computer Science
MTH 243
MTH 362
CSC 411
Computer Organization
CSC 445
Models of Computation
CSC 436
Database Management Systems
CSC 461
Machine Learning
MTH 215
CSC 301
Fundamentals of Programming Languages
CSC 305
Software Engineering
CSC 440
Design and Analysis of Algorithms
CSC 392
Intermediate Topics in Computing
CSC 372
Dynamic Web Design and Programming
CSC 417
Computer Communications
CSC 320
Social Issues in Computing
CSC 310
Programming for Data Science
MTH 451
CSC 212
Data Structures and Abstractions
CSC 340
Applied Combinatorics
CSC 447
Discrete Mathematical Structures
CSC 271
Web Design and Programming
CSC 201
Introduction to Computer Programming
CSC 211
Object Oriented Programming
MTH 180
CSC 200
Computer Problem Solving for S&E
CSC 292
Topics in Computing
CSC 110
Survey of Computer Science
MTH 141
MTH 131
CSC 106
The Joy of Programming
CSC 104
Puzzles and Games
CSC 101
Computing Concepts
CSC 192
Introductory Topics in Computing

- - - taken concurrently



"data structures" for technical interviews

About 21,100,000 results (0.57 seconds)

Commonly used Data Structures

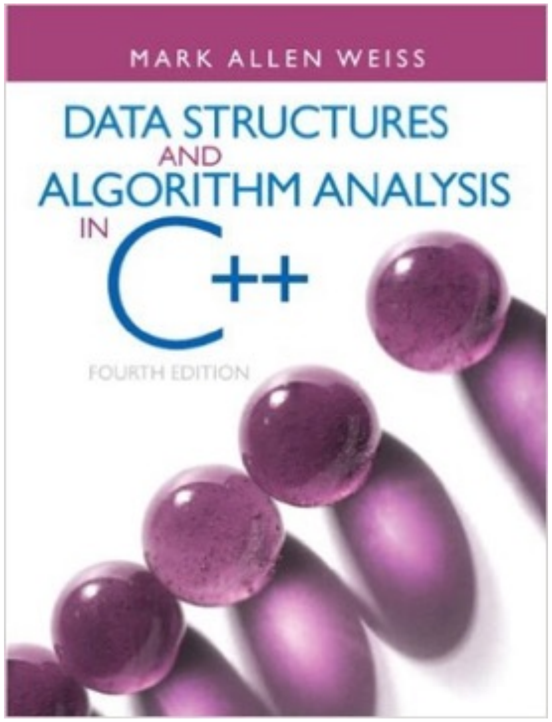
- Arrays.
- Stacks.
- Queues.
- Linked List.
- Trees.
- Graphs.
- Tries (They are effectively trees but it's still good to call them out separately).
- Hash Tables.

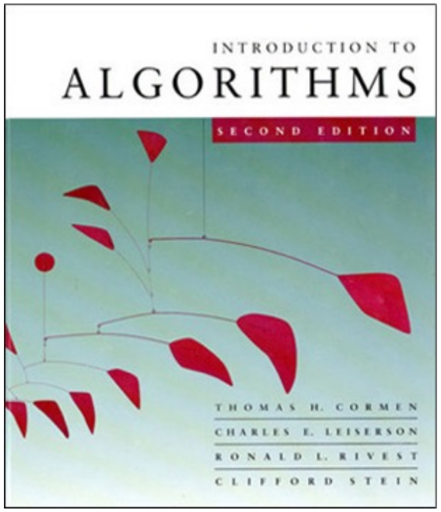
Jul 12, 2018

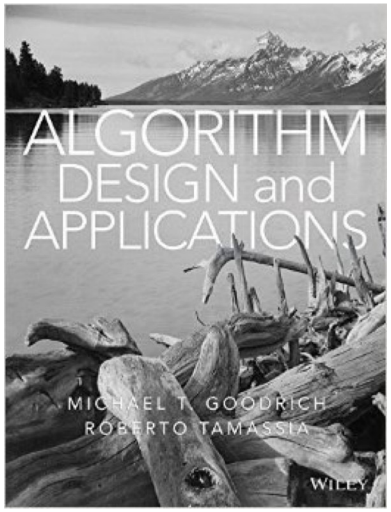
dev.to › fahimulhaq › top-8-data-structures-for-coding-in...

Top 8 Data Structures for Coding Interviews and practice ...

Recommended Textbooks







Need a refresher on C++ programming?

- Read a book
- Enroll in a MOOC (massive open online course)

coursera

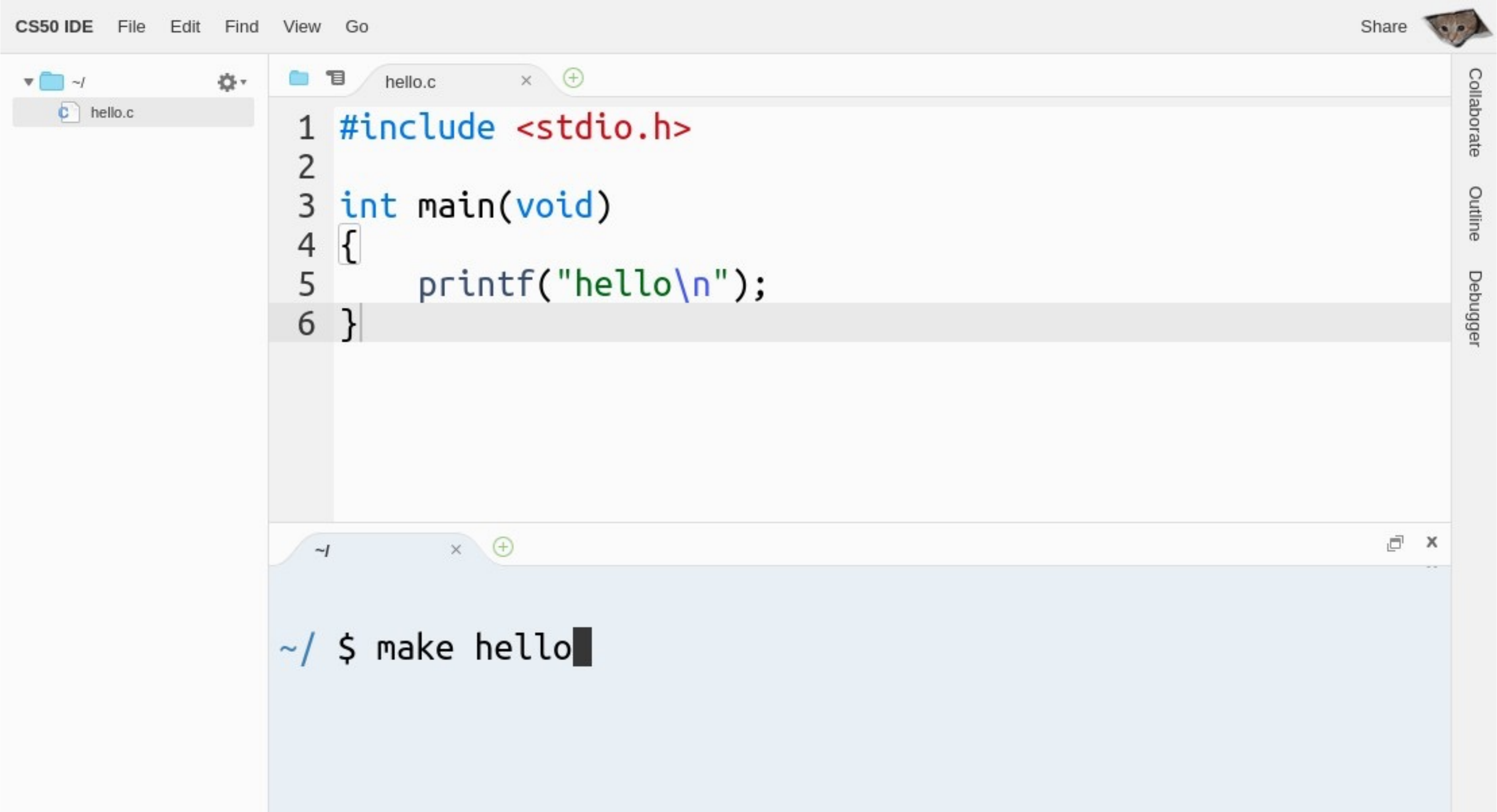
edX

- Solve Challenges

Kattis

HackerRank™
Revolutionizing Tech Recruiting

CS50 IDE



```c
#include <stdio.h>

int main(void)
{
    printf("hello\n");
}
```

```
~/ $ make hello
```

https://ide.cs50.io

Grading (subject to change)

- Lab attendance
  - ✓ synchronous labs (50 points | 5%)
- Assignments
  - ✓ 5 assignments (3 prog. 2 PS) (100 points each | 50%)
  - ✓ 1 final project (350 points | 35%)
- Exams
  - ✓ 1 final exam (100 points | 10%)

Exam is based on lecture materials and assignments

- Review Project
  - ✓ 1 programming project (2 Parts) (30 points | 3%)

Homework Assignments

- Discussions and collaboration are allowed, however you **must** write your own code and solutions

- All assignments are to be turned in on **Gradescope** by the due date
  - late submissions are **NOT** accepted

`Plagiarism?`

- just **don’t do it**
- if you get caught (chances are very high), your name(s) will be immediately reported for further sanctions

What is expected from you?

- **Attend** **synchronous** lectures/labs
  - ✓ I do not spend time taking attendance … but … students skipping lectures will (**very**) likely **fail** this class
- **Organize** your time
  - ✓ lectures, labs, homework assignments, project, exams
- **Participate** and think critically
  - ✓ ask questions (lectures, labs, office hours, Piazza, …)
- **Start** working on assignments **early**
  - ✓ avoid copying/pasting or google'ing answers

Need help?

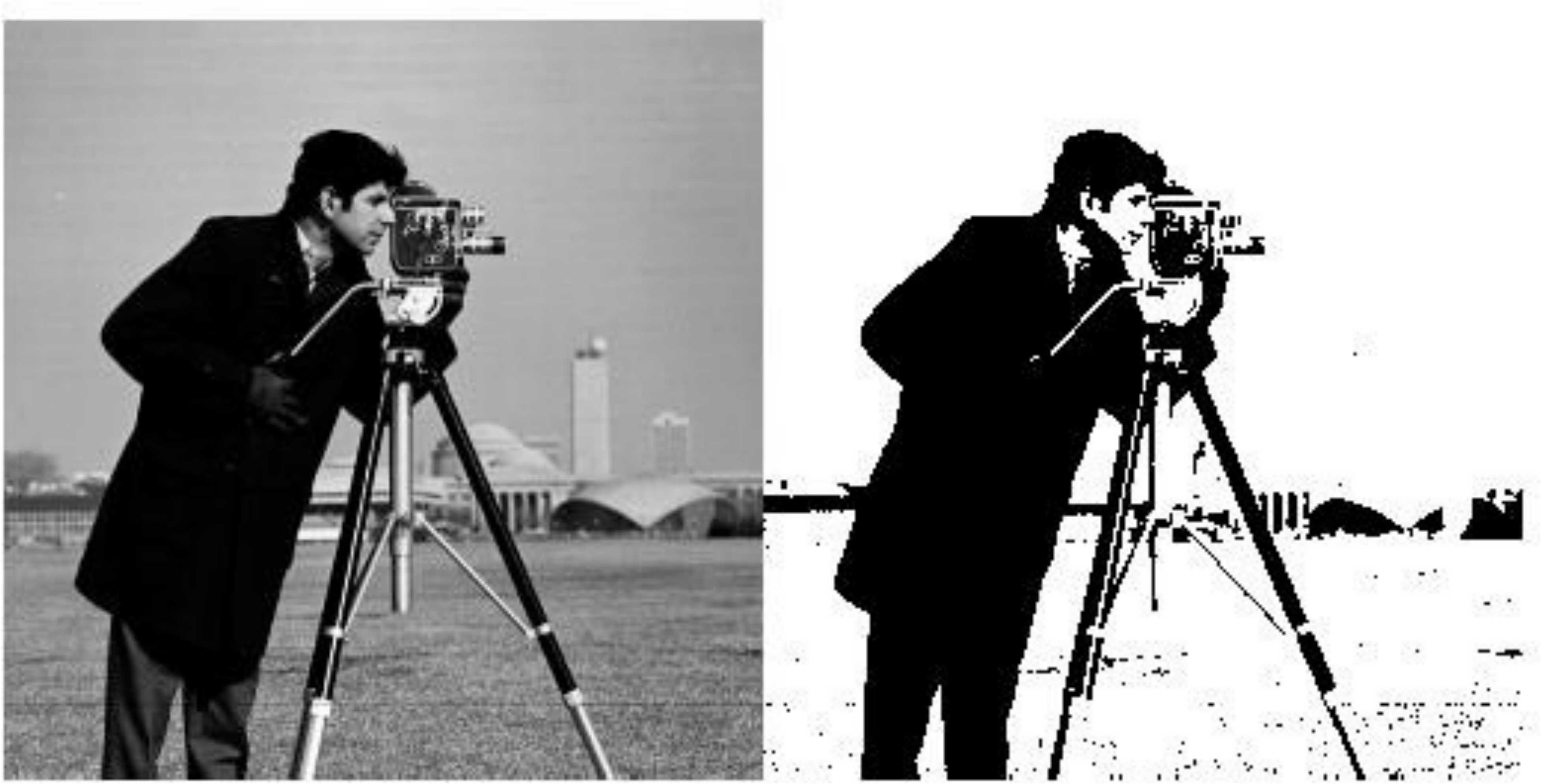
- Post questions on **EdStem**
  - ✓ answer questions, share information

- Contact your TAs
- Come to **Office Hours**

Seriously, seek help!

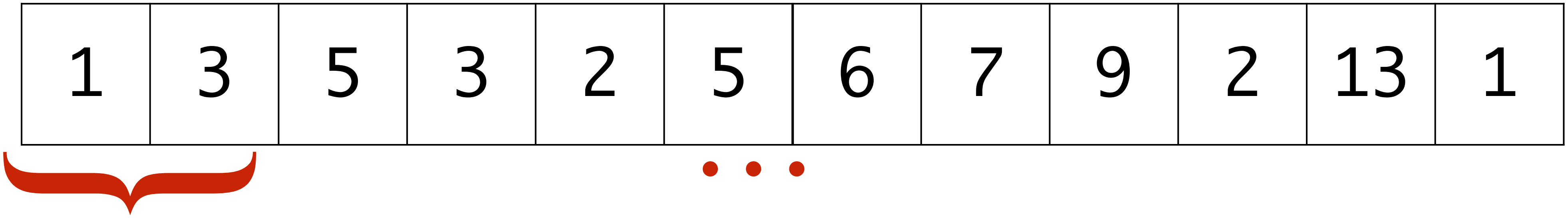
- Spring 2019 Semester's Stats
  - ✓ 66/105 passed (64%)
  - ✓ 39/105 failed (36%)
- Main reason for failing
  - ✓ No submissions!
  - ✓ No project!

Programming Assignment 1



Warming up

- Adjacent elements sum
  - ✓ find the **maximum sum** of any pair of adjacent elements in an array of integers



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