This is CS50.

cs50.brianyu.me

Roadmap

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
March	23	24	25	26	27	28	29
April	30	31	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
May	27	28	29	30	1	2	3
	4	5	6	7	8	9	10

SQL

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	
March	23	24	25	26	27	28	29	
April	30	31	1	2	3	4	5	Test
	6	7	8	9	10	11	12	
	13	14	15	16	17	18	19	
	20	21	22	23	24	25	26	
May	27	28	29	30	1	2	3	
	4	5	6	7	8	9	10	

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	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
May	27	28	29	30	1	2	3
	4	5	6	7	8	9	10

Web Programming

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	
March	23	24	25	26	27	28	29	
April	30	31	1	2	3	4	5	
	6	7	8	9	10	11	12	
	13	14	15	16	17	18	19	Flask
	20	21	22	23	24	25	26	
May	27	28	29	30	1	2	3	
	4	5	6	7	8	9	10	

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May	27	28	29	30	1	2	3
	4	5	6	7	8	9	10

Final Projects

Zoom

Slack

harvard.slack.com

Week 7

- SQL
  - CREATE TABLE
  - INSERT
  - SELECT
  - UPDATE
  - DELETE
  - Indexes
  - Race Conditions
  - SQL Injection

What questions do you have?

Questions

Today

SQL

SQL and Python

Test Review

Part One

SQL

books

id	title	author	year

```
CREATE TABLE books (
  id INTEGER PRIMARY KEY AUTOINCREMENT,
  title TEXT,
  author TEXT,
  year NUMERIC
);
```

ratings

book_id	rating	votes

ratings

book_id	rating	votes

Foreign Key

```
CREATE TABLE ratings (
  book_id INTEGER,
  rating REAL,
  votes INTEGER,
  FOREIGN KEY (book_id) REFERENCES books(id)
);
```

```
INSERT INTO books
(title, author, year)
VALUES ("Emma", "Jane Autsen", 1815);
```

```
SELECT * FROM books
WHERE author = "J.K. Rowling";
```

```
UPDATE ratings
SET rating = 4.2
WHERE book_id = 28;
```

```
DELETE FROM books
WHERE title = "Fahrenheit 451";
```

Multiple Tables

Students

- People
- Classes
- Who are the instructors of each class?
- Who are the students in each class?

```
CREATE TABLE people (
  id INTEGER PRIMARY KEY AUTOINCREMENT,
  name TEXT NOT NULL
);

CREATE TABLE courses (
  id INTEGER PRIMARY KEY AUTOINCREMENT,
  code TEXT NOT NULL,
  title TEXT NOT NULL
);
```

```
CREATE TABLE students (
  person_id INTEGER NOT NULL,
  course_id INTEGER NOT NULL
);

CREATE TABLE instructors (
  person_id INTEGER NOT NULL,
  course_id INTEGER NOT NULL
);
```

```
wget cdn.cs50.net/2020/spring/classes/7/students.db
```

Exercise

Write a SQL query to answer the following question:

What is Amanda's student id?

Exercise

Write a SQL query to answer the following question:

What is the course title for CS51?

Exercise

Write a SQL query to answer the following question:

What are the course codes and titles for all of the CS courses?

Assume that all CS courses have a course code that begins with 'CS'.

Exercise

Write a SQL query to answer the following question:

How many courses are there?

Exercise

Write a SQL query to answer the following question:

How many students are taking CS50?

Exercise

Write a SQL query to answer the following question:

What are the names of all of the instructors? Generate a table with all instructors' names and the course they teach.

Exercise

Write a SQL query to answer the following question:

What are the names of all of the students taking CS50?

We'll continue in

10

minutes

We'll continue in

9

minutes

We'll continue in

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We'll continue in

7

minutes

We'll continue in

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We'll continue in

5

minutes

We'll continue in

4

minutes

We'll continue in

3

minutes

We'll continue in

2

minutes

We'll continue in

1

minute

Part Two

SQL and Python

```
from cs50 import SQL
```

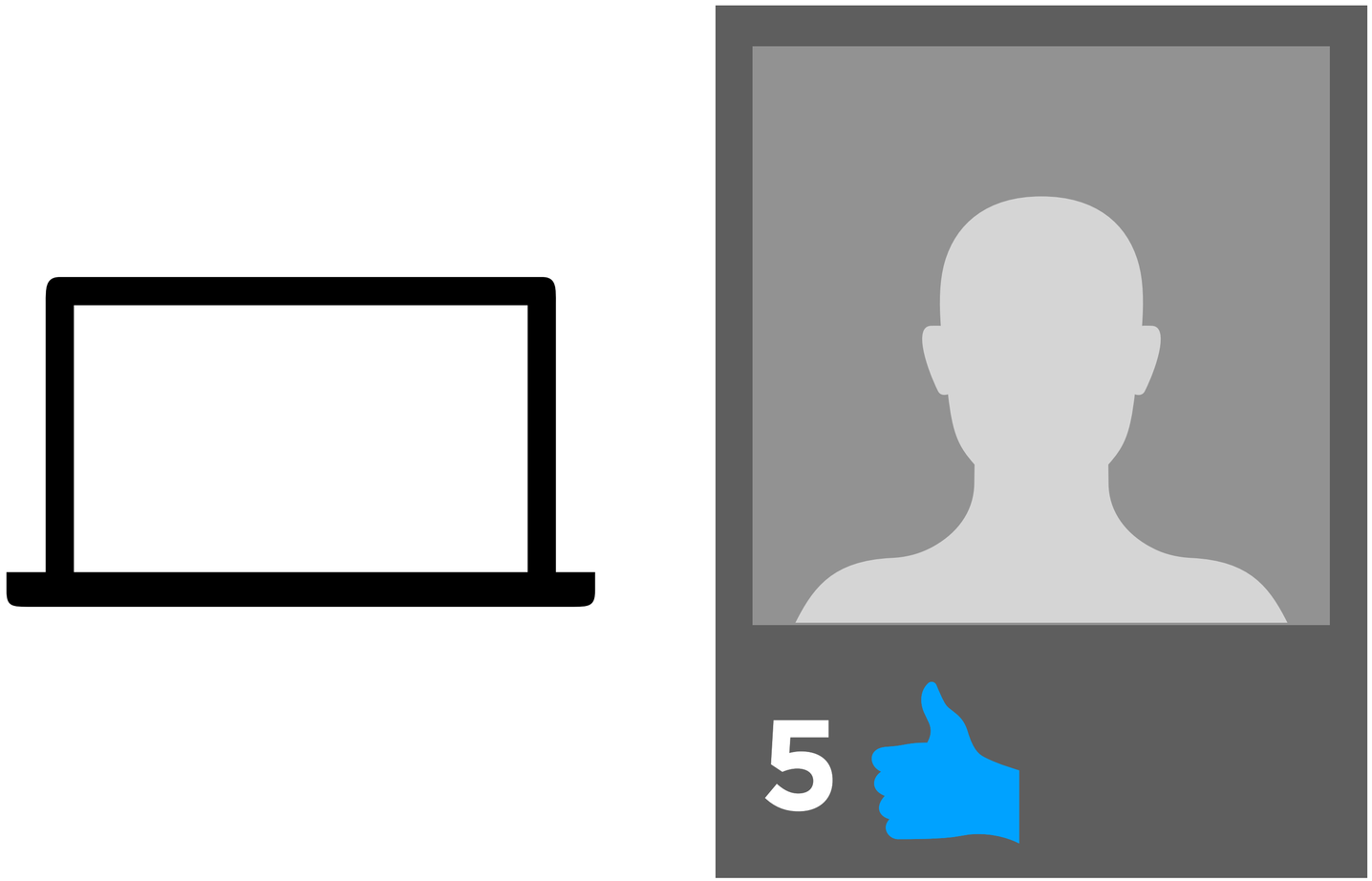
Exercise

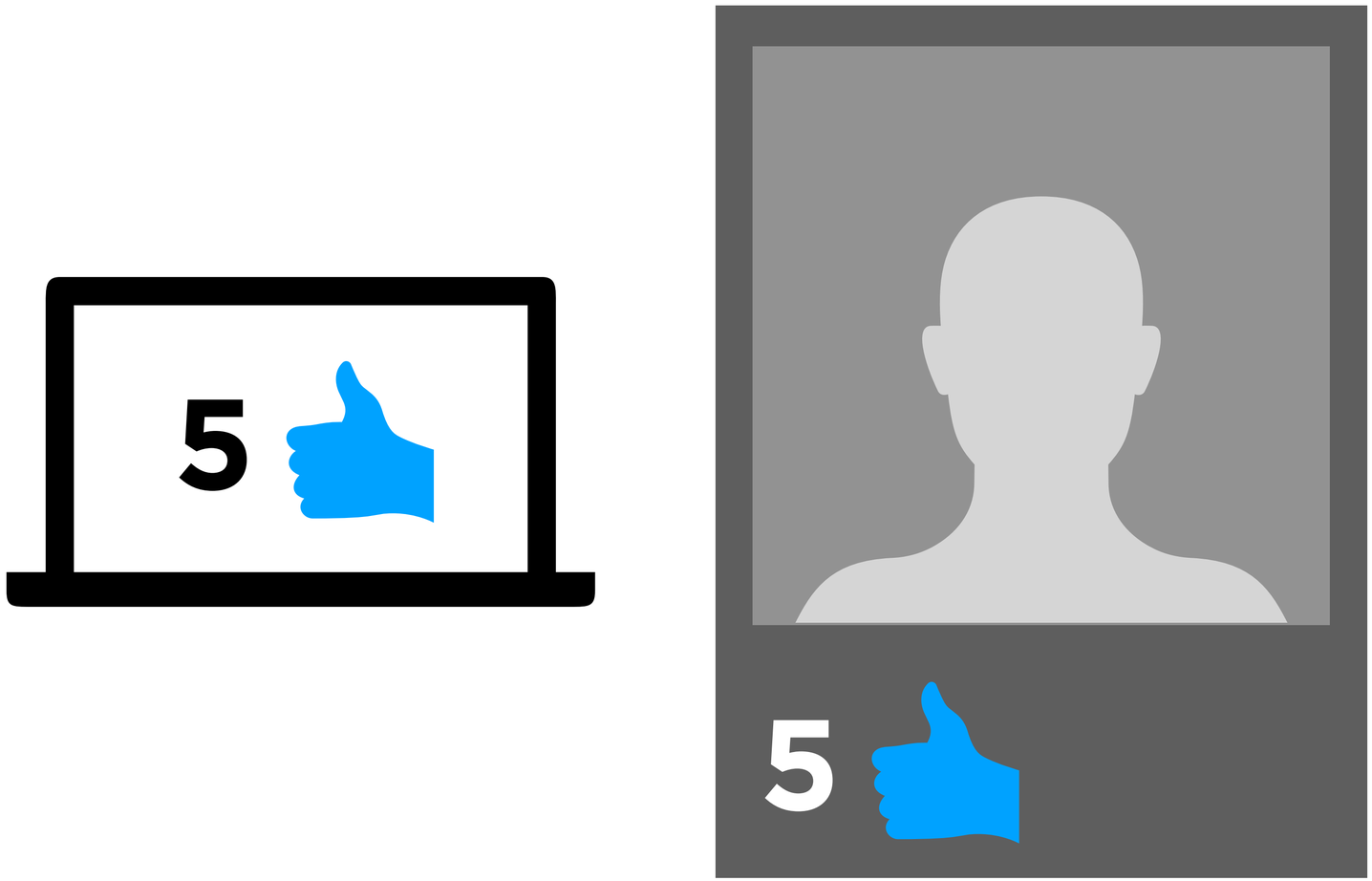
Write a Python program to enroll a student in a course.

```
$ python enroll.py
Name: Emma
Course Code: CS51
Added Emma to CS51
```

Race Conditions

5


5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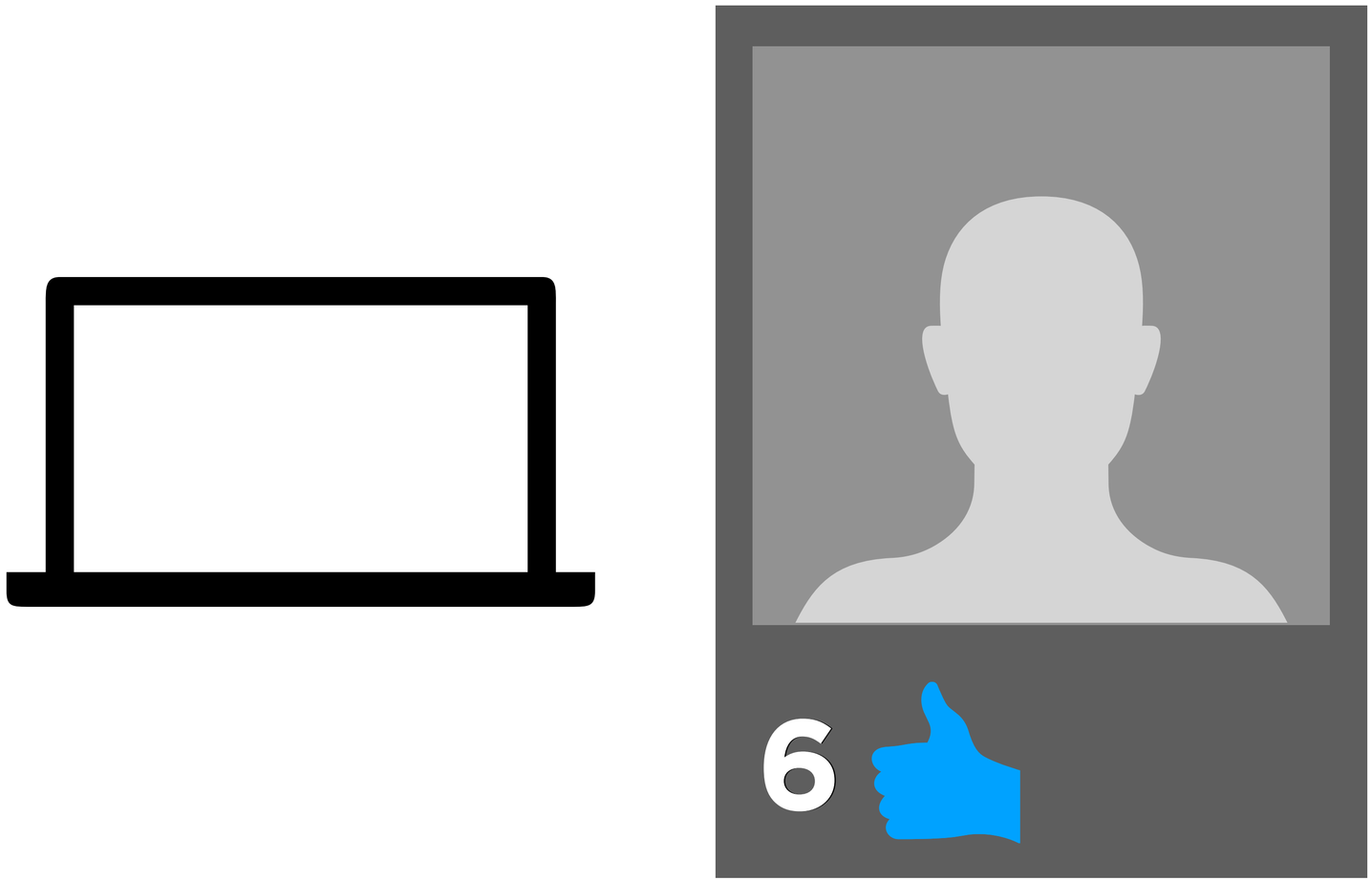
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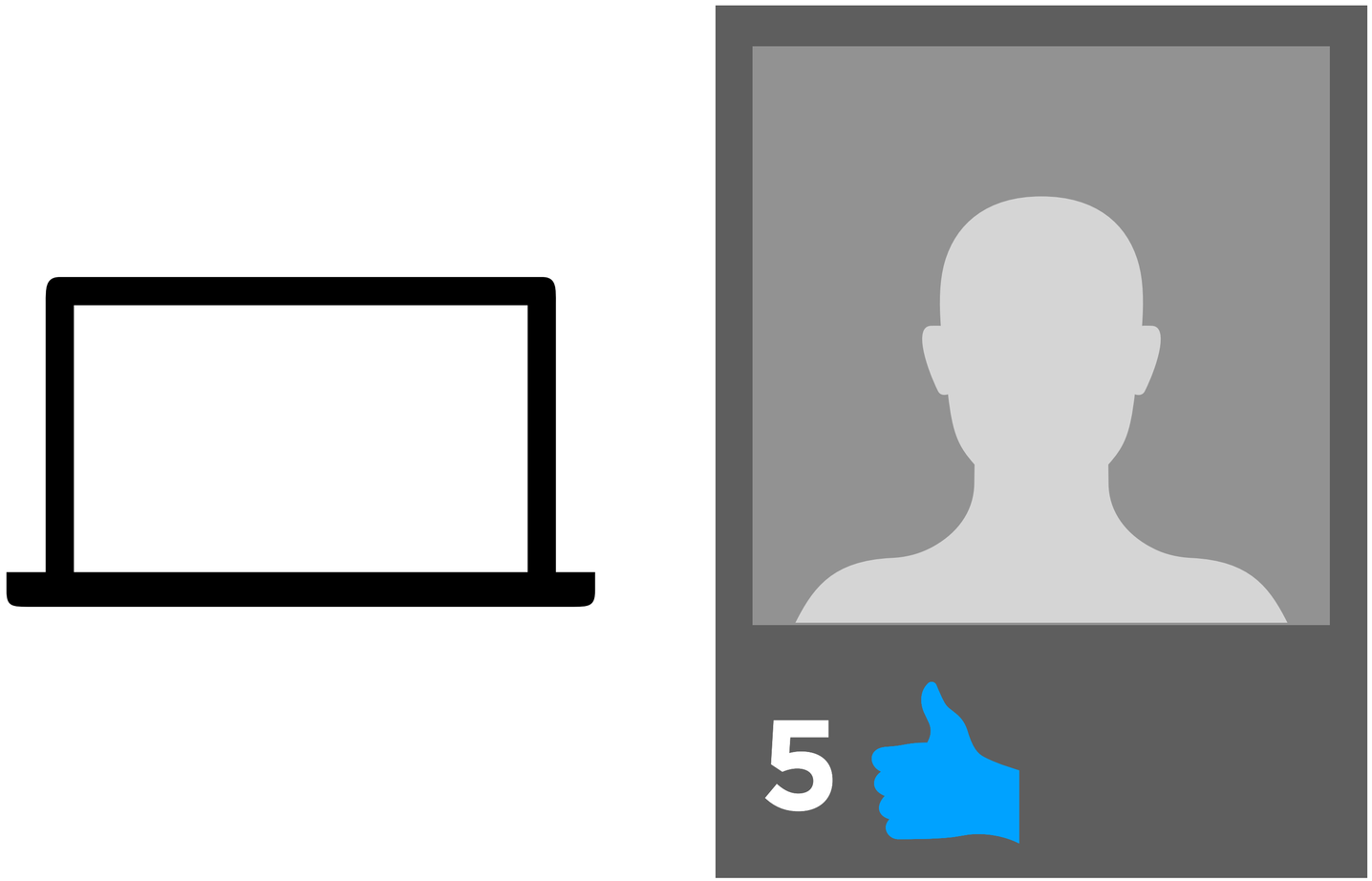
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6

6

SQL Injection

Username:

Password:

```
SELECT * FROM users
WHERE username = username AND password = password;
```

Username:

harry

Password:

12345

```
SELECT * FROM users
WHERE username = username AND password = password;
```

```
SELECT * FROM users
WHERE username = "harry" AND password = "12345";
```

Username:

hacker" --

Password:

```
SELECT * FROM users
WHERE username = username AND password = password;
```

```
SELECT * FROM users
WHERE username = "hacker" --" AND password = "";
```

```
SELECT * FROM users
WHERE username = "hacker" --" AND password = "";
```

We'll continue in

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minutes

We'll continue in

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We'll continue in

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We'll continue in

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We'll continue in

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We'll continue in

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We'll continue in

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We'll continue in

3

minutes

We'll continue in

2

minutes

We'll continue in

1

minute

Part Three

Test Review

Week 0

- Binary
- Representing Data
- Algorithms
- Pseudocode
- Scratch

Week 1

- C
- Compiling
- Strings
- Variables
- Types
- Loops
- Conditions
- Imprecision
- Overflow

Week 2

- Compiling
- Debugging
- Data Types
- Memory
- Arrays
- Strings
- Command-Line Arguments

Week 3

- Searching (Linear, Binary)
- Sorting (Bubble, Selection)
- Big O
- Structs
- Recursion
- Merge Sort

Week 4

- Hexadecimal
- Pointers
- Dynamic Memory
- Memory Layout
- File I/O

Week 5

- Data Structures
- Linked Lists
- Trees
- Hash Tables
- Tries

Week 6

- Python
- Regular Expressions

Week 7

- SQL
  - CREATE TABLE
  - INSERT
  - SELECT
  - UPDATE
  - DELETE
  - Indexes
  - Race Conditions
  - SQL Injection

What questions do you have?

Problem Set 7

Problem Set 7

- Movies
- Houses

This is CS50.