SQL Lab

CS50 for Lawyers

IMDb

Querying a database of movies

Schema

How data is organized in a database

```
wget https://cdn.cs50.net/hls/2023/winter/labs/1/movies.zip
```

```
$  sqlite3 DB_NAME
```

```
$  sqlite3 movies.db
```

```
sqlite> ...
```

```
sqlite>  .schema
```

movies.db

movies.db

movies

stars

people

ratings

directors

movies.db

movies

id	title	year
114709	Toy Story	1995
3606752	Cars 3	2017
2294629	Frozen	2013
...	...	...

stars people ratings directors

movies.db

people

id	name	birth
158	Tom Hanks	1956
5562	Owen Wilson	1968
68338	Kristen Bell	1980
...	...	...

movies stars ratings directors

movies.db

stars

movie_id	person_id
114709	158
3606752	5562
2294629	68338
...	...

movies people ratings directors

SELECT

WHERE

LIKE

ORDER BY

SELECTs (nested)

JOINs

SELECTs (nested)

JOINs

movies

id	title	year
114709	Toy Story	1995
3606752	Cars 3	2017
2294629	Frozen	2013
...	...	...

ratings

movie_id	rating
114709	8.3
3606752	6.7
2294629	7.4
...	...

movies

id	title	year
114709	Toy Story	1995
3606752	Cars 3	2017
2294629	Frozen	2013
...	...	...

ratings

movie_id	rating
114709	8.3
3606752	6.7
2294629	7.4
...	...

```
sqlite>  SELECT id FROM movies WHERE title = "Cars 3";
```

movies

id	title	year
114709	Toy Story	1995
3606752	Cars 3	2017
2294629	Frozen	2013
...	...	...

ratings

movie_id	rating
114709	8.3
3606752	6.7
2294629	7.4
...	...

```
sqlite>  SELECT id FROM movies WHERE title = "Cars 3";
```

movies

id	title	year
114709	Toy Story	1995
3606752	Cars 3	2017
2294629	Frozen	2013
...	...	...

ratings

movie_id	rating
114709	8.3
3606752	6.7
2294629	7.4
...	...

```
sqlite>  SELECT rating FROM ratings WHERE movie_id = 3606752;
```

movies

id	title	year
114709	Toy Story	1995
3606752	Cars 3	2017
2294629	Frozen	2013
...	...	...

ratings

movie_id	rating
114709	8.3
3606752	6.7
2294629	7.4
...	...

```
sqlite>  SELECT rating FROM ratings WHERE movie_id = 3606752;
```

movies

id	title	year
114709	Toy Story	1995
3606752	Cars 3	2017
2294629	Frozen	2013
...	...	...

ratings

movie_id	rating
114709	8.3
3606752	6.7
2294629	7.4
...	...

```
sqlite>  SELECT rating FROM ratings WHERE movie_id = ?;
```

```
sqlite> SELECT rating
        FROM ratings
        WHERE movie_id = ?;
```

```
sqlite> SELECT rating
        FROM ratings
        WHERE movie_id = (
            SELECT id
            FROM movies
            WHERE title = "Cars 3"
        );
```

```
sqlite> SELECT rating
        FROM ratings
        WHERE movie_id = (
            SELECT id
            FROM movies
            WHERE title = "Cars 3"
        );
```

```
sqlite> SELECT rating
        FROM ratings
        WHERE movie_id = (
            3606752
        );
```

SELECTs (nested)

JOINs

movies

id	title	year
114709	Toy Story	1995
3606752	Cars 3	2017
2294629	Frozen	2013
...	...	...

ratings

movie_id	rating
114709	8.3
3606752	6.7
2294629	7.4
...	...

movies

id	title	year
114709	Toy Story	1995
3606752	Cars 3	2017
2294629	Frozen	2013
...	...	...

ratings

movie_id	rating
114709	8.3
3606752	6.7
2294629	7.4
...	...

movies JOIN ratings

id	title	year	movie_id	rating
114709	Toy Story	1995	114709	8.3
3606752	Cars 3	2017	3606752	6.7
2294629	Frozen	2013	2294629	7.4
...	...	...	...	...

movies JOIN ratings

id	title	year	rating
114709	Toy Story	1995	8.3
3606752	Cars 3	2017	6.7
2294629	Frozen	2013	7.4
...	...	...	...

*movie_id column hidden for visualization

Indexes

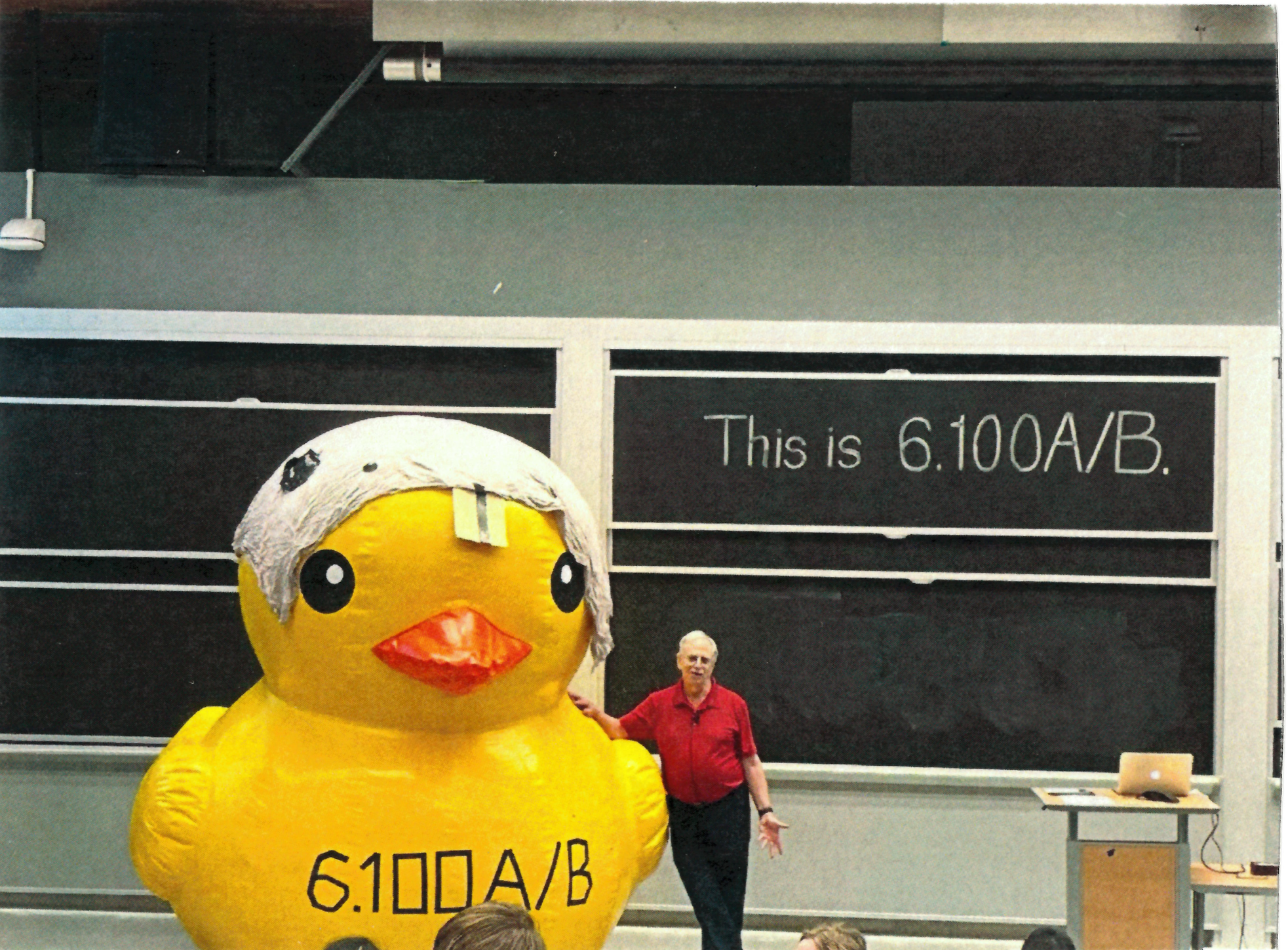
Strategically speeding up queries

```
wget https://cdn.cs50.net/hls/2023/winter/labs/1/cases.zip
```

```
CREATE INDEX indexName ON
tableName(columnName)
```

Fiftyville

Who stole the CS50 duck?


This is 6.100A/B.
6.100A/B

RED LINE
INBOUND
NEXT TRAIN
TRACK 1
01834
EXIT

Greetings from
Stanford
University

- Who the thief is,
- What city the thief escaped to, and
- Who the thief's accomplice is who helped them escape

All you know is that the theft took place on **July 28, 2021** and that it took place on **Humphrey Street**.

```
wget https://cdn.cs50.net/hls/2023/winter/labs/1/fiftyville.zip
```

Ruth

"Sometime within ten minutes of the theft, I saw the thief get into a car in the bakery parking lot and drive away.

If you have security footage from the bakery parking lot, you might want to look for cars that left the parking lot in that time frame."

Eugene

"I don't know the thief's name, but it was someone I recognized.

Earlier this morning, before I arrived at Emma's bakery, I was walking by the ATM on Leggett Street and saw the thief there withdrawing some money."

Raymond

"As the thief was leaving the bakery, they called someone who talked to them for less than a minute.

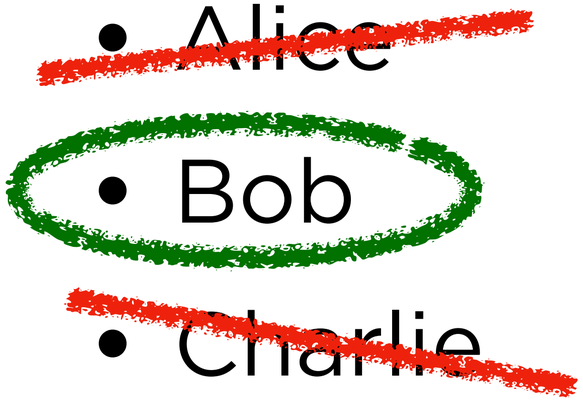
On the call, I heard the thief say that they were planning to take the earliest flight out of Fiftyville tomorrow.

The thief then asked the person on the other end of the phone to purchase the flight ticket."

- Alice
- Bob
- ~~Charlie~~

```
sqlite> SELECT ...

Alice
Bob
Daniel
Kristen
```




```
sqlite> SELECT ...

Angela
Linda
Bob
Emma
```

Ed

Office Hours