SQLite Queries

Reading: Sec 12.2

**Schema**

define -- collection of tables, how they relate
example: Sakila (history, sqlite version)

**ERD**

All “has-a” relations
Notation, one-to-one, one-to-many, many-to-many
[see sakila.graffle]

**Selects**

All examples here use ...211/demos/SQL/sakila.db

Basic: SELECT col1, col2, ... FROM table;

    SELECT name FROM language;
    SELECT first_name, last_name FROM actor;

Issues:

- need to know table names
- need to know column names
- may get lots of data (there are 200 actors in this DB)

**What Tables Are in This DB?**

In SQLite:

    .tables

*NOTE: NO semicolons in dot command!*

*Note semicolons at end of statement*

*Language is not case sensitive; convention puts keywords in caps so they stand out*
What’s in a Table (I)

“Official” way to learn about table:

```
.schema actor
```

System will print the “create table” command that made the table, including names and types of each column

“varchar” = “variable length character field”, i.e. “string”

Much more info than you need, just look for column names...

What’s in a Table (II)

The informal way to explore what’s in a table...

First: find out how many records:

```
SELECT count(*) FROM actor;
```

Then, if there are lots of records, add a “limit N” to the end of a query that selects all columns:

```
SELECT * FROM actor limit 5;
```

That’s not too helpful (or readable) with SQLite. So first:

```
.mode column
.header on
```

Ripple Exercise

*What should I type to learn about film and customer tables?*

WHERE Clause

We usually want to narrow search for data, specify attributes

Example: customer table has column named active; 0 means “account closed”. To get names of inactive customers:

```
SELECT first_name, last_name FROM customer WHERE active = 0;
```

Note that count can be combined with where clause:

```
SELECT count(*) FROM customer WHERE active = 0;
```
**Boolean Expressions**

Values in a WHERE clause can be combined with Boolean operators AND, OR, NOT

```
SELECT title FROM film WHERE rental_duration = 4 AND rental_rate < 2.99;
SELECT rating, title, description FROM film WHERE rating = 'G' OR rating = 'PG';
```

**Ripple Exercise**

What should I type to answer the following questions?

- which films have a replacement cost less than three times the rental rate?
- which films rated G or PC cost less than $1 to rent?
- how many films were released in 2006?

**Pattern Matching**

Queries can see if a text field matches a pattern

use the LIKE operator:

```
SELECT title, description FROM film WHERE description LIKE "%Scientist%";
```

**Aside: Case Sensitive?**

String comparisons are case sensitive. Try this:

```
SELECT 2 * 5;
SELECT 'a' = 'A';
SELECT 'A' = 'A';
```

By default the LIKE operator is not case sensitive:

```
SELECT 'aloha' like 'A%';
```
Groups

Use “GROUP BY” to collapse rows into groups that have the same value for specific column(s):

```sql
SELECT rental_duration, count(*) FROM film GROUP BY rental_duration;
```

How this works:
- internally SQLite does a select to make a temporary table, and then it sorts the table according to rental duration
- rows that have the same duration are merged into a single row
- summary functions (count, max, etc) can be applied to the group

Having [Advanced]

A “having” clause is like a “where” clause, except it can be used to constrain group counts and other dynamic values.

This example prints the names that appear more than once as a first name:

```sql
select first_name, count(*) as n from customer group by first_name having n > 1;
```

How it works:
- compute a temporary table, using count, as described above
- filter out all the results where the count is 1 or less

Ripple Exercise

How do I write these queries using groups?

- how many copies of film 1 are in each store? [use inventory table]
- print a table that shows how many films were released each year
- print a table that shows how many customers are active or inactive

Some more queries, using all of the above:

- how many film categories are there?
- how many films are horror movies (category 11)? [use film_category table]
- how many films include trailers?
- how many NC-17 films include deleted scenes?
Sakila Schema

Primary Data

bridge

Language

Film

Inventory

Address

Customer

film_actor

Actor

film_category

Category

Rental