Intro to Postgresql

Questions

- What is a database?
- What are the different kinds of databases?
- What is SQL?
- How do I create database tables?
- When should I use certain kinds of fields?
- What is "database modeling"?
- What is CRUD
- How do I create relationships between database models?
- How do I translate English into SQL?

What is a database?

- "collection of records"
- sticky notes
- spreadsheets

Anything that holds data in an organized fashion

Allows you to retrieve info in a sorted and filtered format

What is SQL?

- Structured
- Query
- Language

It's a programming language for talking to databases!

"Relational Databases"

Based on Relational Algebra

What are the different kinds of SQL databases?

- PostgreSQL
- Oracle
- MySQL
- MariaDB
- SQLite
- MS SQL

What are the different kinds of NoSQL databases?

- MongoDB (Document Store)
- CouchDB (Document Store with Versioning)
- Apache Cassandra ("Distributed Database")
- Google BigTable

What is a Database Engine?

- It's a program
- It understands SQL
- It stores data to the hard drive

How do I model a simple todo app?

- description
- due date
- priority
- duration
- status

How do I translate my "fields/properties" into SQL?

- description: string
- due date: date or timestamp
- priority: integer (not a string, because those are hard to compare)
- duration: integer
- status: boolean

How do I create a database?

```
createdb todo-app-db
```

How do I create a database table?

"tables" in a database are like to sheets in a spreadsheet

```sql
create table todos(
  description text,
  due_date timestamp,
  priority integer,
  duration integer,
  status boolean
);
```

How do I add data to a table?

```sql
INSERT INTO todos
    (description, due_date, priority, duration, status)
VALUES
    ('finish sql lecture', '2018-10-31', 1, 45, FALSE)
;
```

(SQL disregards caps, whitespace, and linebreaks
)

How do I see what's in a table?

```
select * from todos;
select description, priority from todos;
```

Order of column names matters!

How do I insert

```sql
 insert into todos
(description, due_date, priority, duration, status)
values
('pick up oakley''s tux', '2018-11-02', 2, 60, false);

insert into todos
(description, due_date, priority, duration, status)
values
('pick up milla''s suit of armor', '2018-11-02 17:00:00', 2, 60, false);
```

How do I select a specific row?

```
select * from todos where
  description='sleep';
```

How do I select multiple rows?

```
select * from todos where description like '%milla%';
```

Or, using the case-insensitive version:

```
select * from todos where description ilike '%miLlA%';
```

How do I delete a row?

First, do a select and make sure the thing you want to delete is printed

Then:

```sql
delete from todos where description='sleep';
```

How do I create unique IDs per record?

```sql
create table todos(
  id serial primary key,
  description text,
  due_date timestamp,
  priority integer,
  duration integer,
  status boolean
);
```

How do I change a value in a row?

```
update todos set description='fly to lunch' where id=6;

update todos set description='fly to lunch', priority=4, duration=30 where id=6;
```

CRUD, what is it?

- Create
- Retrieve
- Update
- Delete

The matras for database modeling

- an author has (written) many books
- a book has a genre
- an author has many genres through books

How do I create relationships between tables?

author "has many" books

```sql
create table authors (
  id serial primary key,
  name text
);

create table books (
  id serial primary key,
  title text,
  ISBN text,
  cover_image text,
  page_count integer,
  author_id integer references authors (id)
);
```

How do I insert related data?

Hard code it!

```
insert into authors (name) values ('stephen king');
insert into books (title, author_id) values ('the shining', 1);
insert into books (title, author_id) values ('it', 1);
insert into books (title, author_id) values ('the dark tower', 1);
insert into books (title, author_id) values ('pet semetary', 1);
```

How do I query for related data?

```sql
select * from books where author_id = 1;
```

How do I run a sql file?

Save your create table statements in a file, then run it like so on the Terminal:

```
psql -f schema.sql bookstore
```

Tips:

- save your `create table` statements in a file called `schema.sql`
- save your dummy data (`insert` statements) in a file called `seed.sql`

You'll often need to reset your database by doing a `dropdb`, `createdb`, **and then re-run your** `.sql` **files**