

Fullstack Development

Preflight project - database

[Github Repo](#)

Prerequisite

- Docker
 - Docker desktop
- Database management tools
 - Dbeaver

Database choices

- Relational database (Comparison)
 - PostgreSQL
 - MariaDB
 - MySQL
 - SQLite
- NoSQL
 - Types
 - Vendors

Containers

- Containers provide a way of creating an isolated environment in which applications and their dependencies can live.
- Why?
 - Portability (push to repository)
 - Consistency (works everywhere)
 - Easy deployment (can test on local machine)

Docker




- A containerisation platform
 - Leading player
- Alternative `Podman`

Should you run database on docker container?

It depends.

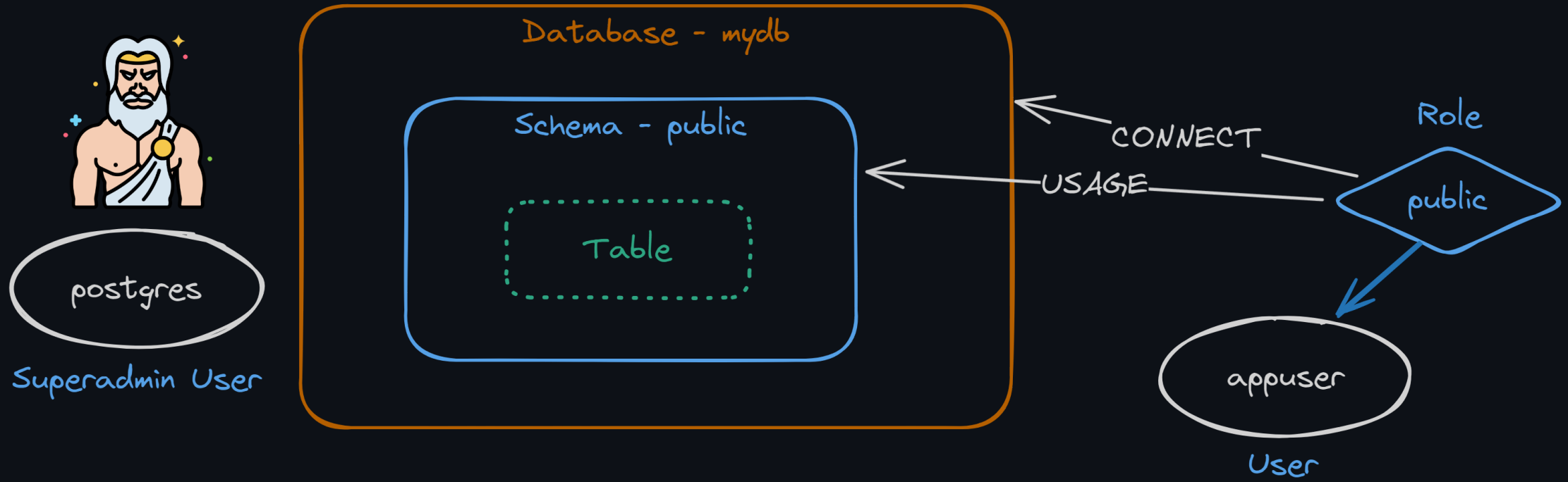
Spinning up database instance

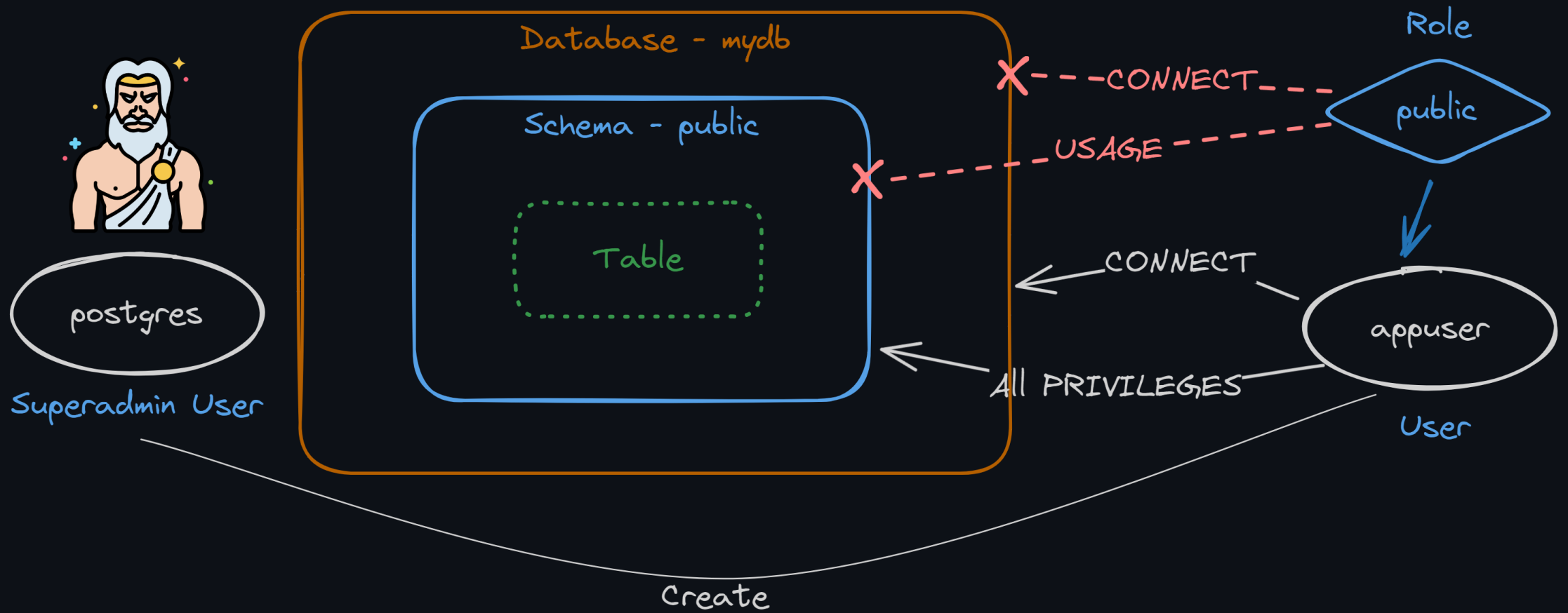
- Files

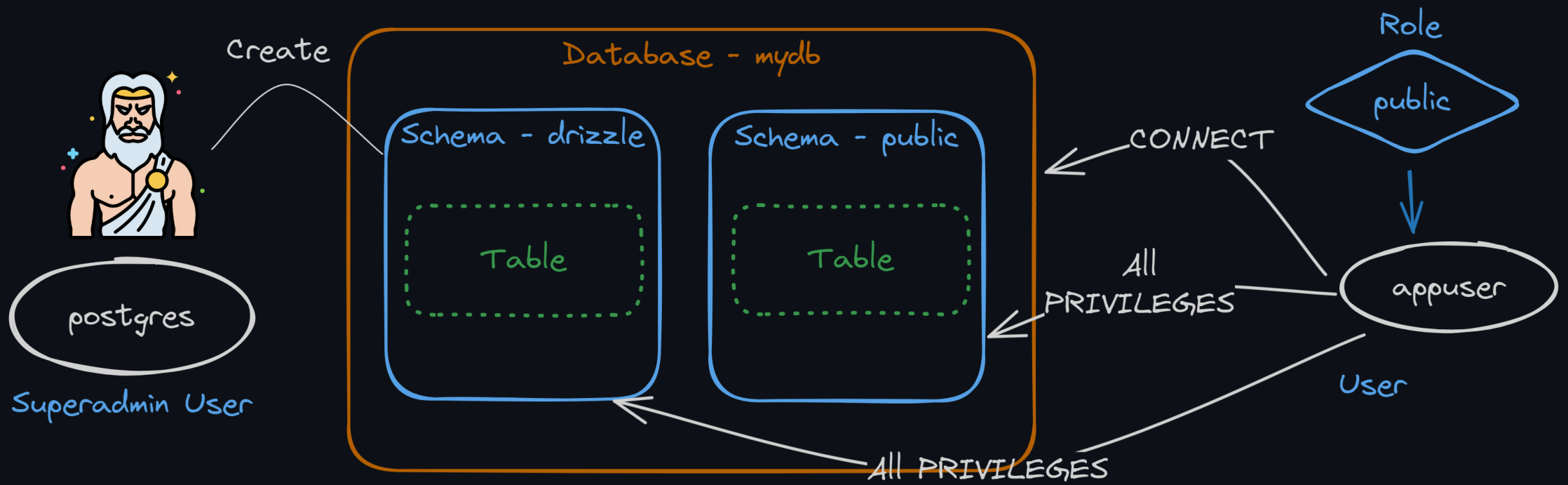
-  `./.env` Copy from [here](#).
-  `./.gitignore` [\(link\)](#)
-  `./docker-compose.yml` [\(link\)](#)

-  `docker compose up -d`

Database user management







DB user management

- `docker exec -it pf-db bash`
- `psql -U postgres -d mydb`
- Don't forget to change the password.

```
REVOKE CONNECT ON DATABASE mydb FROM public;  
REVOKE ALL ON SCHEMA public FROM PUBLIC;  
CREATE USER appuser WITH PASSWORD '1234';  
CREATE SCHEMA drizzle;  
GRANT ALL ON DATABASE mydb TO appuser;  
GRANT ALL ON SCHEMA public TO appuser;  
GRANT ALL ON SCHEMA drizzle TO appuser;
```

Note on `psql`

- `\l` to list all databases
- `\du` to list users
- `\dn` to list schema
- `\dt` to list tables
- `\c` to view connected database or change to another db.
- `\q` to quit

ORM

- Object Relational Mapper
- A piece of software designed to translate between the data representations used by databases and those used in programming (in our case, Typescript).

Why ORM?

- Enable type information when interacting with database.
- Allow you to write schema file and can be committed to repository.
 - Good for communication or documentation
- Nice Tooling
 - Database synchronization
 - Schema generation from existing database
 - Database viewer
 - Migration tool

Should you use ORM?

It depends.

JavaScript / TypeScript ORM

- List

Setting up Drizzle





- `npm init -y`
- `npm i drizzle-orm postgres dotenv`
- `npm i -D drizzle-kit`
- `npm i typescript ts-node tsconfig-paths`

TypeScript




- `npx tsc --init`
- Add this in `./tsconfig.json`

```
{
  "ts-node": {
    "require": ["tsconfig-paths/register"]
  },
  "compilerOptions": {
    // ...
    "baseUrl": "./",
    "paths": {
      "@db/*": [".db/*"]
    }
    // ...
  }
}
```



Database initialization

- Files
 -  `./db/utlis.ts` [\(Link\)](#)
 -  `./db/schema.ts` [\(Link\)](#)
 -  `./drizzle.config.ts` [\(Link\)](#)
-  `npx drizzle-kit push`

Migration

-  `./db/migrate.ts` [\(Link\)](#)
-  `npx drizzle-kit generate`
-  `npx ts-node ./db/migrate.ts`

CRUD

-  `./db/client.ts` [\(Link\)](#)
-  `./db/prototype.ts` [\(Link\)](#)
- `npx ts-node ./db/prototype.ts`

Script

To save yourself some typing, add this in `package.json`

```
{  
  // ...  
  "scripts": {  
    "db:generate": "drizzle-kit generate",  
    "db:push": "drizzle-kit push",  
    "db:migrate": "ts-node ./db/migrate.ts",  
    "db:prototype": "ts-node ./db/prototype.ts"  
  }  
}
```