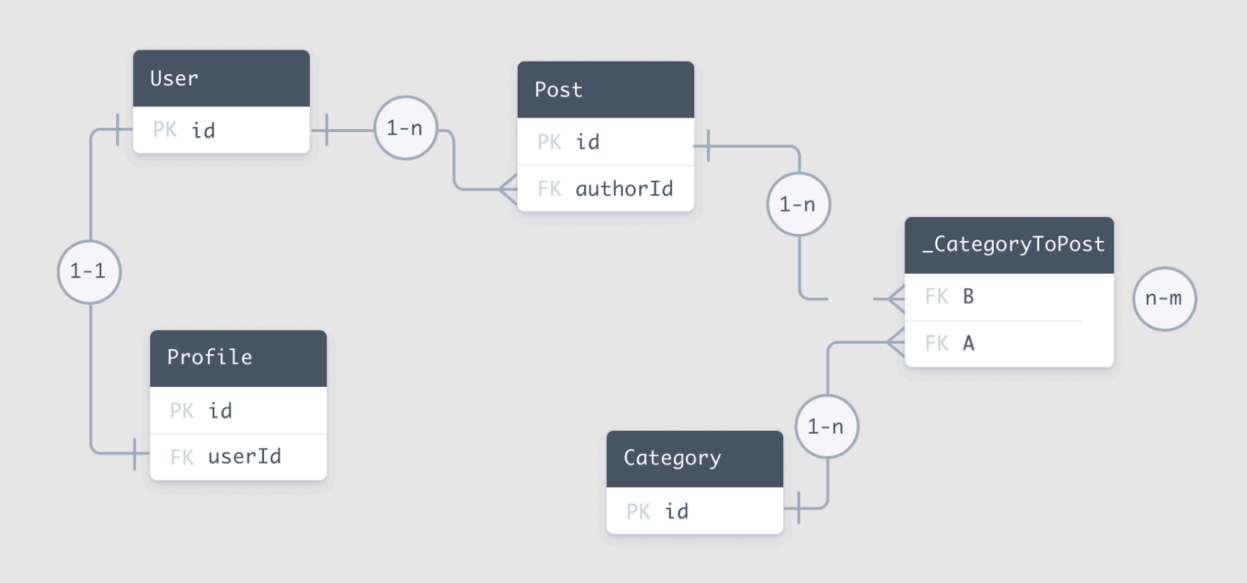
Week 12.5

Prisma Relationships

In today's lecture, Harkirat provided a comprehensive `Recap of Prisma`, focusing on the framework's approach to defining and `managing relationships within a database schema`. He also explains the significance of the `Prisma Client` in facilitating database operations and the role of `Prisma's migration system` in tracking and applying schema changes.

Relationships

In Prisma, relationships between tables are defined using a straightforward and expressive syntax within the Prisma schema file. These relationships are crucial for representing how data in one table is associated with data in another, and Prisma supports several types of relationships to model the various ways in which data can be interconnected.



Types of Relationships in Prisma

Prisma allows you to define the following types of relationships:

1. **One to One**: A relationship where a single record in one table is linked to a single record in another table.
2. **One to Many**: A relationship where a single record in one table is linked to multiple records in another table.
3. **Many to One**: The inverse of one to many, where multiple records in one table are linked to a single record in another table.
4. **Many to Many**: A relationship where multiple records in one table are linked to multiple records in another table.

One to Many Relationship in the TODO App

For the TODO app, there is a one-to-many relationship between the `User` and `Todo` models. This means that one user can have many todos, but each todo is associated with only one user.

Updating the Prisma Schema

To define a one-to-many relationship in Prisma, you update the `schema.prisma` file to include a reference from the `Todo` model to the `User` model. Here's how the updated schema looks based on the provided image:

```
// This is your Prisma schema file, // learn more about it in the docs: <https://pris.ly/d/prisma-schema> generator client { provider = "prisma-client-js" } datasource db { provider = "postgresql" url = "postgresql://postgres:mysecretpassword@localhost:5432/postgres" } model User { id Int @id @default(autoincrement()) username String @unique password String firstName String lastName String todos Todo[] } model Todo { id Int @id @default(autoincrement()) title String description String done Boolean @default(false) userId Int user User @relation(fields: [userId], references: [id]) }
```

In this schema:

- The `User` model has a `todos` field, which is an array of `Todo` objects. This represents the "many" side of the one-to-many relationship.
- The `Todo` model has a `userId` field, which stores the reference to the associated `User`. It also has a `user` field that establishes the relationship using the `@relation` attribute. The `fields: [userId]` part specifies which field on the `Todo` model is used to store the connection, and `references: [id]` part specifies which field on the `User` model is being referred to.

Why do you need Prisma Client

The Prisma Client is an auto-generated and type-safe database client that allows developers to interact with their database in a comfortable and secure way. It is part of the Prisma ecosystem, which aims to make database access easy and robust.

```
import { PrismaClient } from '@prisma/client'; const prisma = new
PrismaClient(); async function createTodoForUser(userId: number, title:
string, description: string) { const todo = await prisma.todo.create({ data:
{ title, description, user: { connect: { id: userId }, }, }, }); return todo;
} async function getUserWithTodos(userId: number) { const userWithTodos =
await prisma.user.findUnique({ where: { id: userId }, include: { todos: true
}, }); return userWithTodos; } // Example usagecreateTodoForUser(1, 'Prisma
Client', 'Learn how to use Prisma Client').then(todo => {
console.log('Created new todo:', todo); }); getUserWithTodos(1).then(user =>
{ console.log('User with todos:', user); });
```

In this example, `createTodoForUser` creates a new `Todo` record associated with a `User` by their `id` The `getUserWithTodos` function retrieves a user and their related `Todo` items using Prisma Client's `findUnique` method with the `include` option to fetch related records.

Updating the Database and the Prisma Client

After updating the schema, you need to apply the changes to your database and regenerate the Prisma Client to reflect the new relationship:

```
npx prisma migrate dev --name relationship npx prisma generate
```

The `prisma migrate dev` command creates a new migration file in the `prisma/migrations` folder, which includes the SQL statements necessary to update the database schema with the new relationship. The `prisma generate` command updates the Prisma Client to include the new relationship logic.

Exploring the Prisma Migrations Folder

When you explore the `prisma/migrations` folder after running the migration, you will see a new directory for the migration you just created. Inside this directory, there will be files that describe the changes made to the database schema, including the addition of foreign keys and any other constraints related to the new relationship.

Todo Functions

In the context of a Prisma-based application, you can create functions to interact with the database and perform CRUD operations on the `Todo` and `User` models. Below are detailed explanations and code snippets for creating todos, retrieving todos for a user, and fetching todos along with user details.

1. createTodo Function

The `createTodo` function allows you to insert a new todo into the database for a specific user.

Solution:

```
import { PrismaClient } from "@prisma/client"; const prisma = new PrismaClien
t(); async function createTodo(userId: number, title: string, description: st
ring) { const todo = await prisma.todo.create({ data: { title, description, u
serId }, }); console.log(todo); } createTodo(1, "go to gym", "go to gym and d
o 10 pushups");
```

In this function, `prisma.todo.create` is used to create a new `Todo` record associated with a `User` by their `userId`. The `data` object contains the fields required for the `Todo` model.

2. getTodos Function

The `getTodos` function retrieves all todos associated with a specific user.

Solution:

```
import { PrismaClient } from "@prisma/client"; const prisma = new PrismaClien
t(); async function getTodos(userId: number) { const todos = await prisma.tod
o.findMany({ where: { userId: userId, }, }); console.log(todos); } getTodos
(1);
```

Here, `prisma.todo.findMany` is used with a `where` clause to filter todos by the `userId`, returning all todos for that user.

3. getTodosAndUserDetails Function

The `getTodosAndUserDetails` function fetches todos along with the details of the user who created them. This is similar to performing a join in SQL.

Bad Solution (Separate Queries):

```
import { PrismaClient } from "@prisma/client"; const prisma = new PrismaClien
t(); async function getTodosAndUserDetails(userId: number) { const user = awa
it prisma.user.findUnique({ where: { id: userId } }); const todos = await pri
sma.todo.findMany({ where: { userId: userId, } }); console.log(user); consol
e.log(todos); } getTodosAndUserDetails(1);
```