

This course section is optional!

As a web developer, you should know SQL and NoSQL basics.

In this course we'll continue with NoSQL in the examples after these database sections.

What Is SQL?

Also see the previous course section!

SQL is a query language that's typically used for querying relational database management systems (RDBMS)



Strict schema, data structured across multiple tables



Tables entries can be connected via unique identifiers



Data can be inserted or retrieved via SQL statements

Our Goal / Demo

Store (and work with) data about restaurants and reviews for these restaurants

Restaurants

Unique ID

Name

Address
(Street, City, ...)

Type
(Indian, Italian, ...)

Reviews

Unique ID

Reviewer Name

Rating

Text

Date

Steps We'll Take In This Module

1

Install & set up our SQL database system / software

2

Define our tables and their schemas (structure)

3

Learn how to insert data into our database tables

4

Learn how to read data into from database tables – including filtering etc.

5

Learn how to update data in our database tables

6

Learn how to delete data in our database tables

CRUD

Installing A SQL Database System

Which one?

MySQL

Open Source
Very Popular

PostgreSQL

Open Source
Very Popular

Microsoft SQL

Commercial License

...

SQL Database Servers & The Big Picture

Database admin
(e.g. you)
may directly connect
to DB server
to administer DB or
work with data
in the database



Hosts
databases
which store
data



Database Server
(e.g. MySQL)

Website server (backend code)
connects to database server and
issues SQL commands

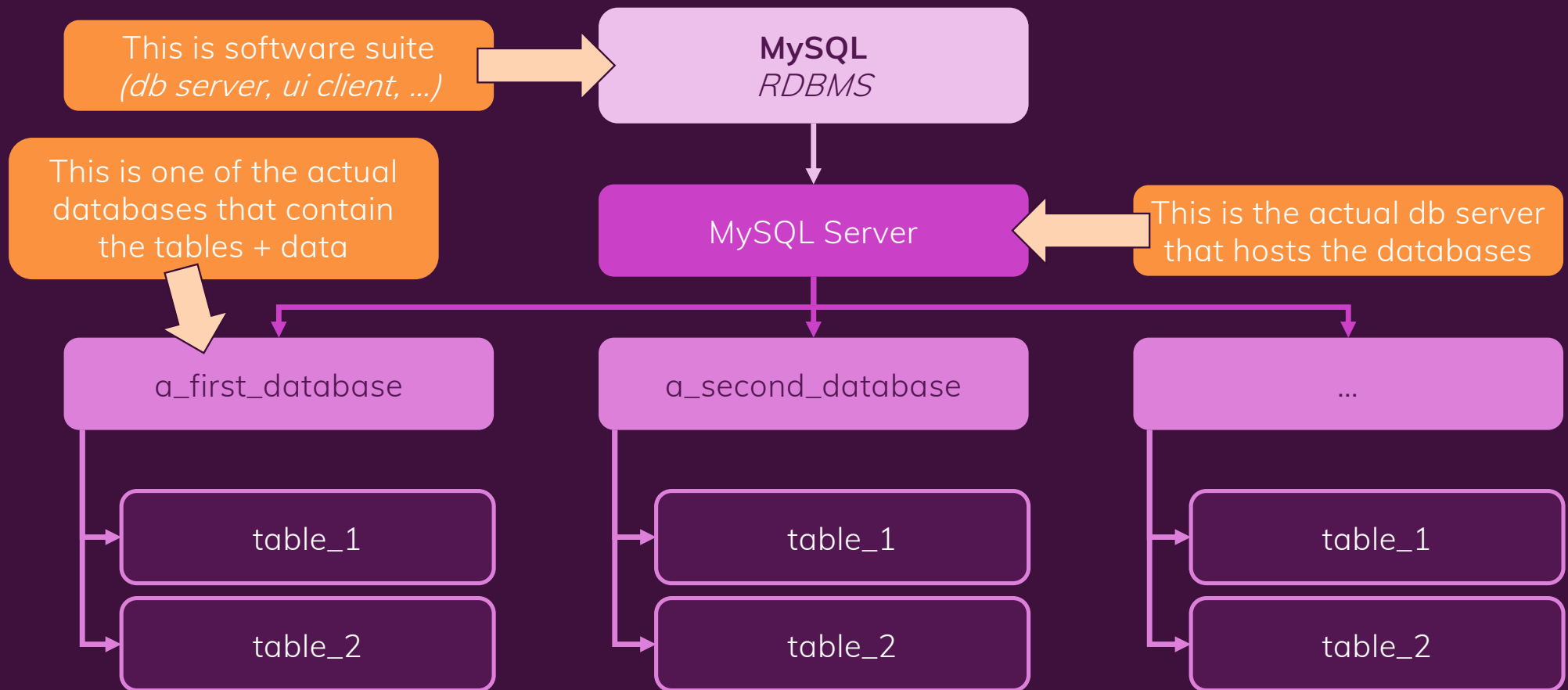


Web Server
(e.g. built with NodeJS)

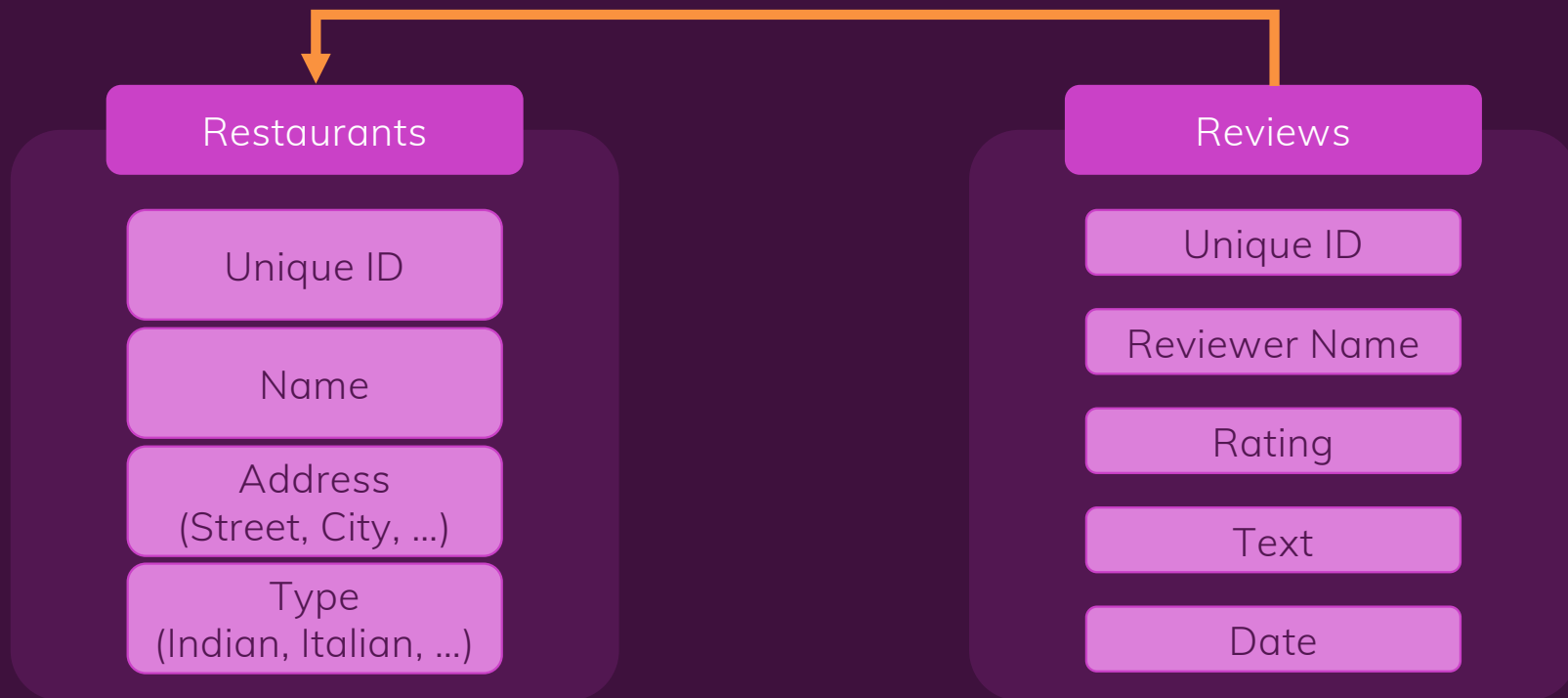


User (website client) sends
requests to web server and receives
response (e.g. HTML etc.)

Database System vs Database

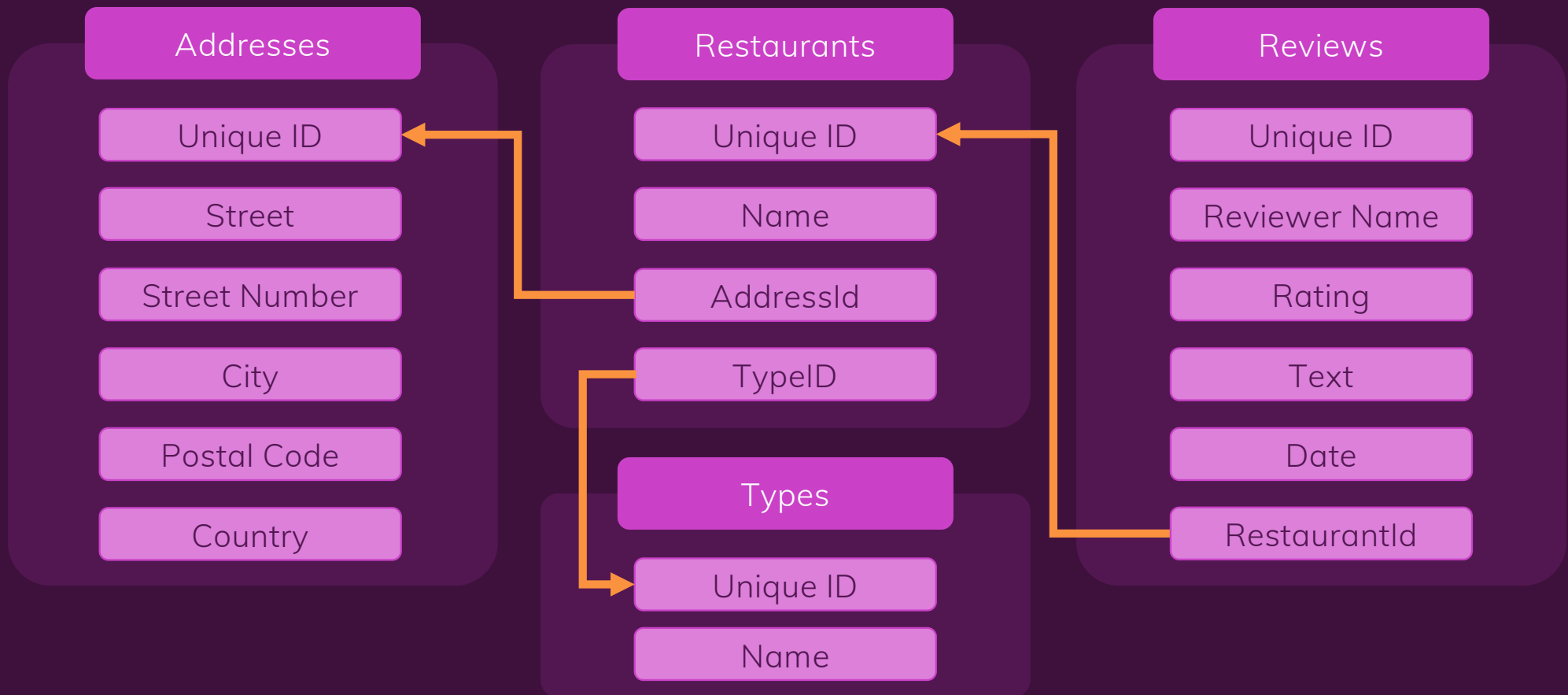


Defining Our Database Tables & Schema / Structure



Two tables are not optimal – we would have complex data in some fields

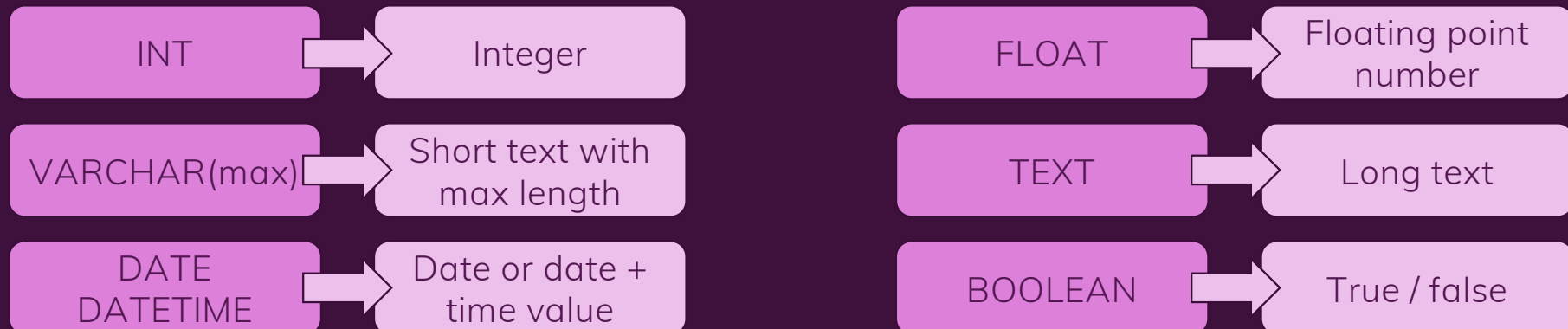
Defining Our Database Tables & Schema / Structure



Creating Our Database Tables & Schemas

```
CREATE TABLE addresses (  
  id INT AUTO_INCREMENT PRIMARY KEY  
  street VARCHAR(255)  
  street_number VARCHAR(255)  
  city VARCHAR(255)  
  postal_code VARCHAR(5)  
  country VARCHAR(255)  
)
```

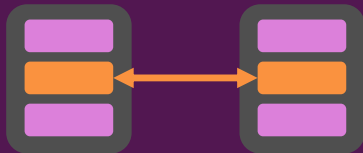
Key Data Types



Understanding Relationships In Databases

One-to-One

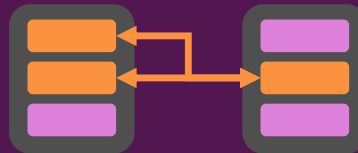
One record in table A is related to exactly one other record in table B



Example: A team has exactly one team leader and that team leader leads exactly one team

One-to-Many (or Many-to-One)

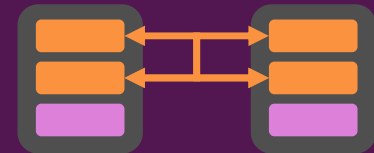
One record in table A is related to many records in B, each record in B is only related to one record in A



Example: A restaurant has many reviews but each review is for exactly one restaurant

Many-to-Many

One record in table A is related to many records in B, each record in B is also related to many records in A



Example: A restaurant has many customers and each customer visits many restaurants