SQL - INTRO

Table Structure

Kodkod 4

Overview

- **Table Structure** (Rows and columns, keys)
- **XAMPP** (Download xampp, import classicmodels)
- **SQL Query** (Select from)
- **School Exercise** (example)

Table Structure

A **table** is an arrangement of information or data, typically in **rows and columns**.

	Column 1	Column 2	Column 3
Row 1		X	
Row 2	X		
Row 3			
Row 4	X		
Row 5		X	X
Row 6			X

Table Structure

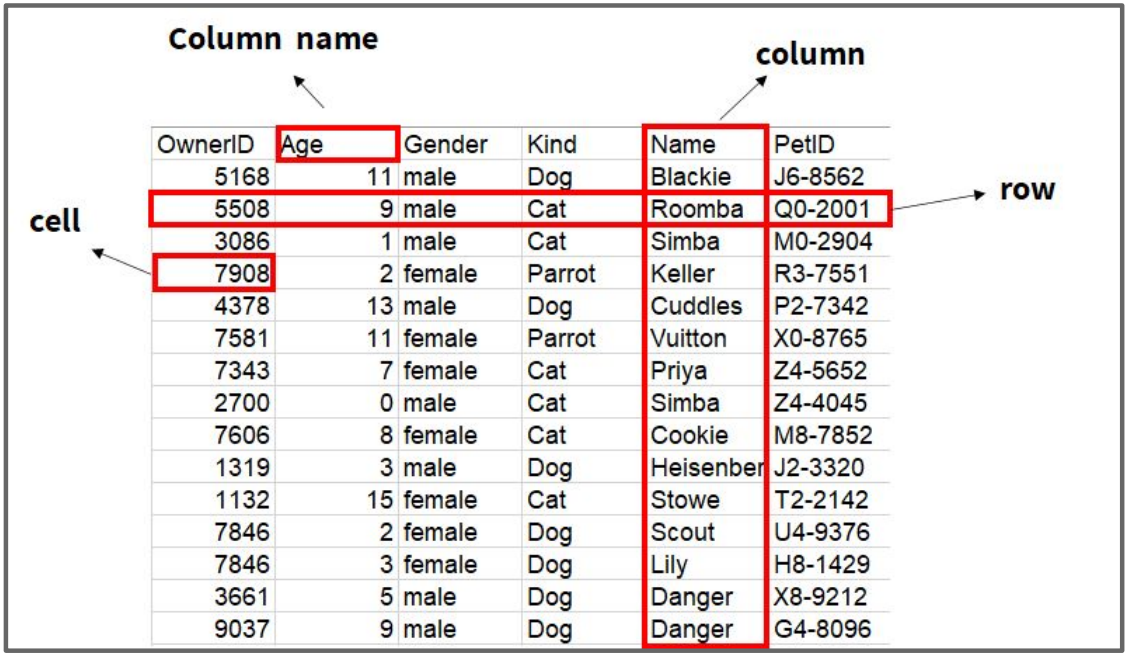
A **column** is usually identified by a **name**, that can consist of a word, phrase or a numerical index. The intersection of a row and a column is called a cell.

Id	Name	Email	Investments
231	Albert Master	albert.master@gmail.com	Bonds
210	Alfred Alan	aalan@gmail.com	Stocks
256	Alison Smart	asmart@biztalk.com	Residential Property
211	Ally Emery	allye@easymail.com	Stocks
248	Andrew Phips	andyp@mycorp.com	Stocks
234	Andy Mitchel	andym@hotmail.com	Stocks
226	Angus Robins	arobins@robins.com	Bonds
241	Ann Melan	ann_melan@iinet.com	Residential Property
225	Ben Bessel	benb@hotmail.com	Stocks
235	Bensen Romanolf	benr@albert.net	Bonds

Table Structure

You can think of it this way:

- **Columns:**
  class fields
- **Rows**:
  class instance
- **Cell:**
  value



OwnerID	Age	Gender	Kind	Name	PetID
5168	11	male	Dog	Blackie	J6-8562
5508	9	male	Cat	Roomba	Q0-2001
3086	1	male	Cat	Simba	M0-2904
7908	2	female	Parrot	Keller	R3-7551
4378	13	male	Dog	Cuddles	P2-7342
7581	11	female	Parrot	Vuitton	X0-8765
7343	7	female	Cat	Priya	Z4-5652
2700	0	male	Cat	Simba	Z4-4045
7606	8	female	Cat	Cookie	M8-7852
1319	3	male	Dog	Heisenber	J2-3320
1132	15	female	Cat	Stowe	T2-2142
7846	2	female	Dog	Scout	U4-9376
7846	3	female	Dog	Lily	H8-1429
3661	5	male	Dog	Danger	X8-9212
9037	9	male	Dog	Danger	G4-8096

Primary and foreign key

- **Primary key** - a column or set of columns that uniquely identify a row in the table.
- **Foreign key** - a column or set of columns whose values reference the Primary Key in another table.
- To insert a row with a foreign key value, a matching Primary Key must already exist in the related table.

Primary and foreign key

Age	Name	OwnerID
30	Ron	5168
41	Ben	5508
21	Tanya	3086
65	Katie	7908
78	Michal	4378
45	Anna	7581
33	Ella	7343
59	Rona	2700
64	Don	7606
42	John	1319
28	Kurt	1132
39	Ran	7846

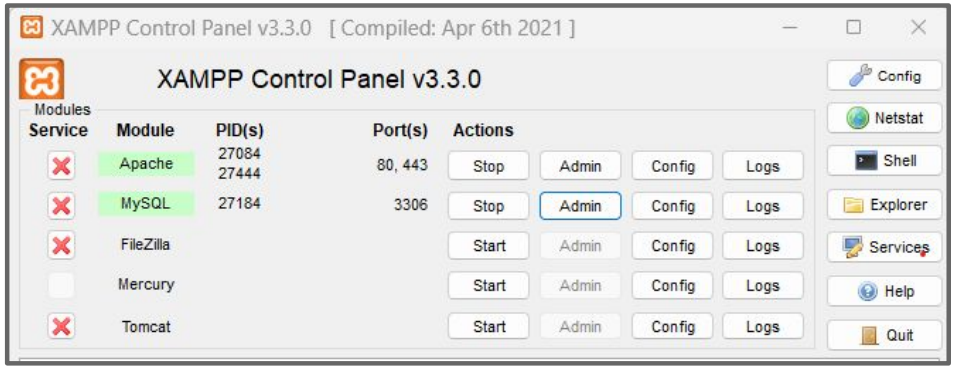
Foreign key

Primary key

OwnerID	Age	Gender	Kind	Name	PetID
5168	11	male	Dog	Blackie	J6-8562
5508	9	male	Cat	Roomba	Q0-2001
3086	1	male	Cat	Simba	M0-2904
7908	2	female	Parrot	Keller	R3-7551
4378	13	male	Dog	Cuddles	P2-7342
7581	11	female	Parrot	Vuitton	X0-8765
7343	7	female	Cat	Priya	Z4-5652
2700	0	male	Cat	Simba	Z4-4045
7606	8	female	Cat	Cookie	M8-7852
1319	3	male	Dog	Heisenber	J2-3320
1132	15	female	Cat	Stowe	T2-2142
7846	2	female	Dog	Scout	U4-9376
7846	3	female	Dog	Lily	H8-1429
3661	5	male	Dog	Danger	X8-9212
9037	9	male	Dog	Danger	G4-8096

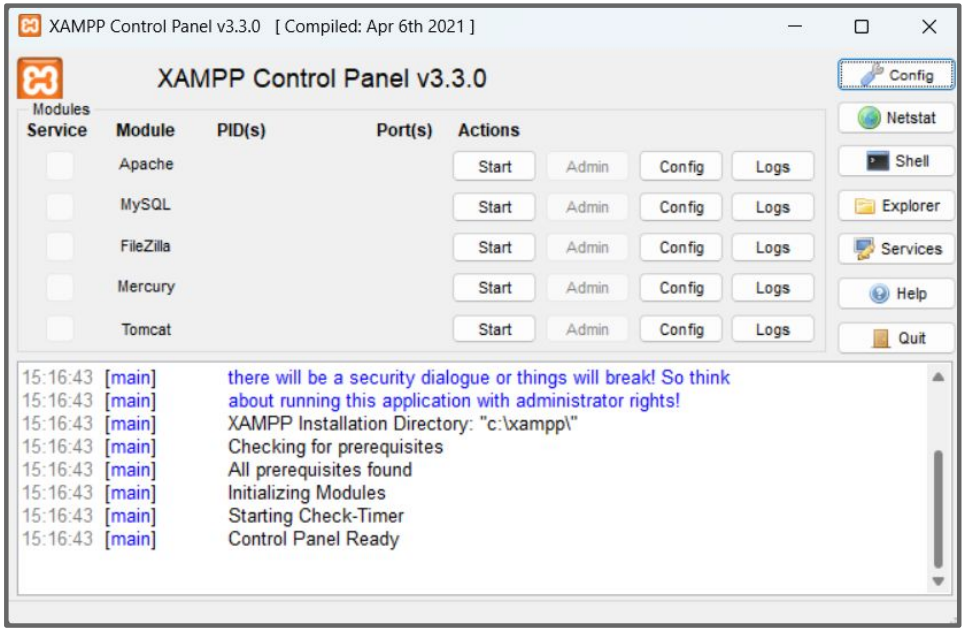
XAMPP

- We will use the MySQL database management system (DBMS).
- We will access it through the web interface called phpMyAdmin.
- XAMPP is a simple tool that installs and starts both MySQL and phpMyAdmin automatically.

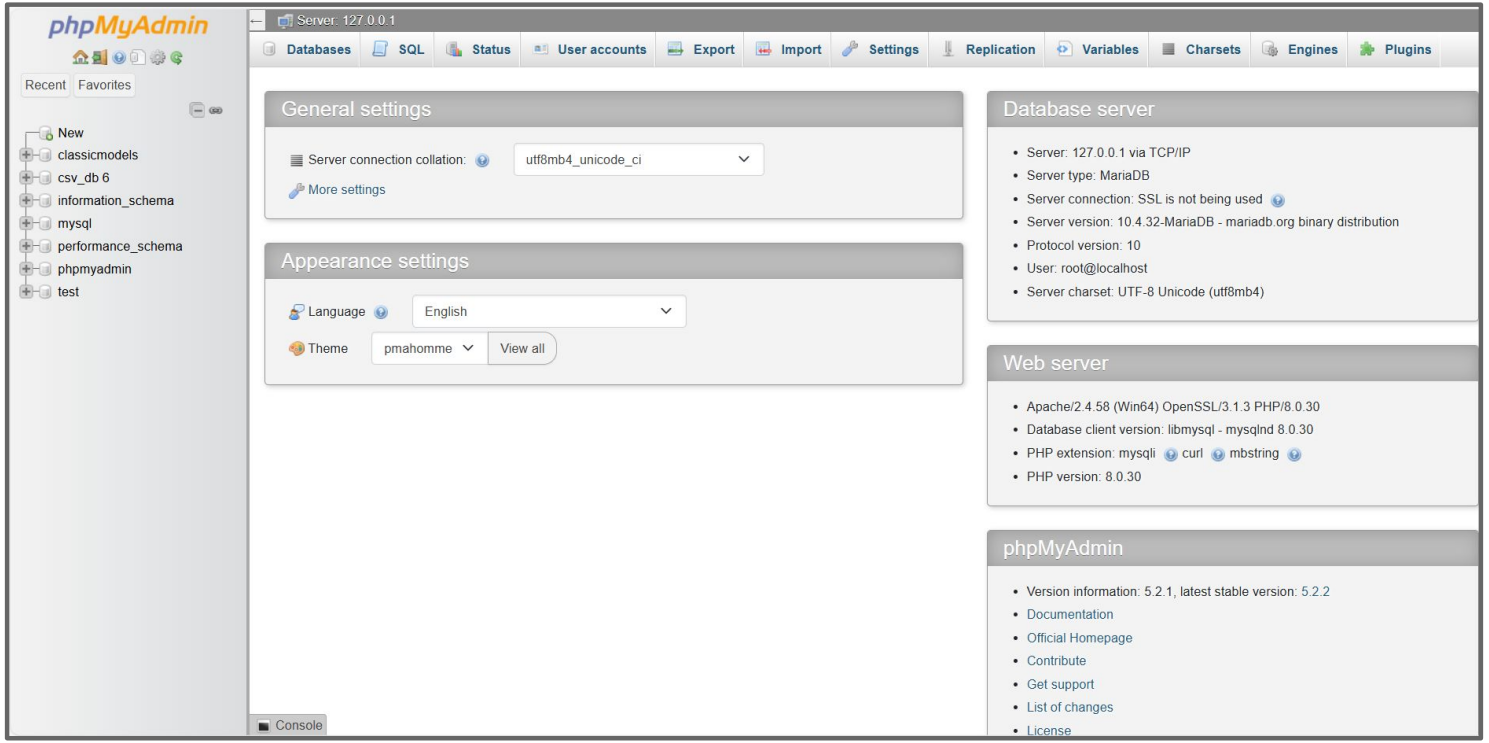


XAMPP

- Download and install XAMPP.
- Start both the **Apache** and **MySQL** modules
- Click on **Admin**. The phpMyAdmin control panel should be open.



XAMPP


phpMyAdmin
Recent
Favorites
New
classicmodels
csv_db 6
information_schema
mysql
performance_schema
phpmyadmin
test
Server: 127.0.0.1
Databases
SQL
Status
User accounts
Export
Import
Settings
Replication
Variables
Charsets
Engines
Plugins
General settings
Server connection collation:
utf8mb4_unicode_ci
More settings
Appearance settings
Language
English
Theme
pmahomme
View all
Database server
Server: 127.0.0.1 via TCP/IP
Server type: MariaDB
Server connection: SSL is not being used
Server version: 10.4.32-MariaDB - mariadb.org binary distribution
Protocol version: 10
User: root@localhost
Server charset: UTF-8 Unicode (utf8mb4)
Web server
Apache/2.4.58 (Win64) OpenSSL/3.1.3 PHP/8.0.30
Database client version: libmysql - mysqlnd 8.0.30
PHP extension: mysqli curl mbstring
PHP version: 8.0.30
phpMyAdmin
Version information: 5.2.1, latest stable version: 5.2.2
Documentation
Official Homepage
Contribute
Get support
List of changes
License
Console

XAMPP

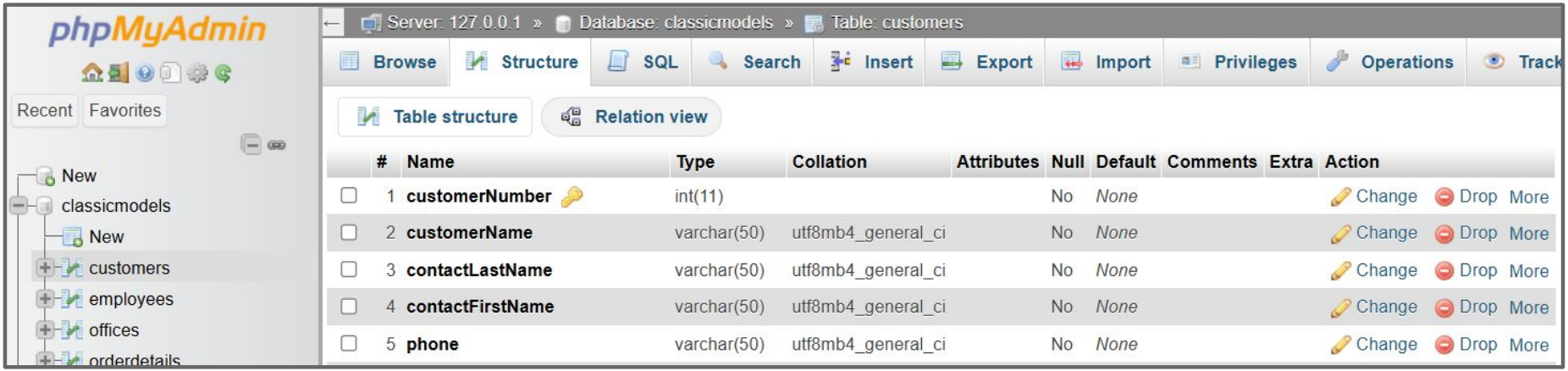
- Now we’re going to import some data into our MySQL database.
- Download the **classicmodels** dataset from the link provided.
- You’ll need to extract the folder before importing it into XAMPP.

XAMPP

- Click on the **Import** tab in **phpMyAdmin** to begin uploading the database.
- Select the file **mysqlsampledatabase.sql** you extracted from the ZIP file
- Click the **Import** option located at the bottom of the page.
- You should see **classicmodels** listed in the menu on the right.
- Clicking on one of the tables will show the data

XAMPP

- Click on the **customers** table.
- At the top, select **Structure**.
- This will display the table's schema — the definition of its fields.



SQL - Structured Query Language

- It does exactly what its name implies: it sends queries to relational databases and follows a defined structure.

Let's learn our first Query: **SELECT** and **FROM.**

- **SELECT** is used to specify the columns (fields) you want to retrieve from a table or query.
- **FROM** is used to specify the table (or tables) from which the data should be retrieved.

SQL

- General Syntax:

```
SELECT <columns> FROM <table>;
```

- Example:

```
SELECT customerName FROM customers;
```

- Try it on the **classicmodels** database.

SQL

- You can specify multiple columns by separating them with commas:

```
SELECT customerName, phone FROM customers
```

- Try it on the **classicmodels** database.

SQL

- You can specify multiple columns by separating them with commas:

```
SELECT customerName, phone FROM customers;
```

- You can also retrieve all columns at once by using the wildcard symbol *:

```
SELECT * FROM customers
```

- Try it on the **classicmodels** database.

Class Exercises

1. Retrieve the list of all **employees** first names.
2. Get only the **productName** column from the **products** table.
3. Retrieve the **customerName** and **contactFirstName** columns from the **customers** table.

Summary

- We reviewed the differences between **rows** and **columns**.
- Used the **XAMPP** system.
- Wrote **SQL queries**.
- Completed a short exercise.