

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

Column name					
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
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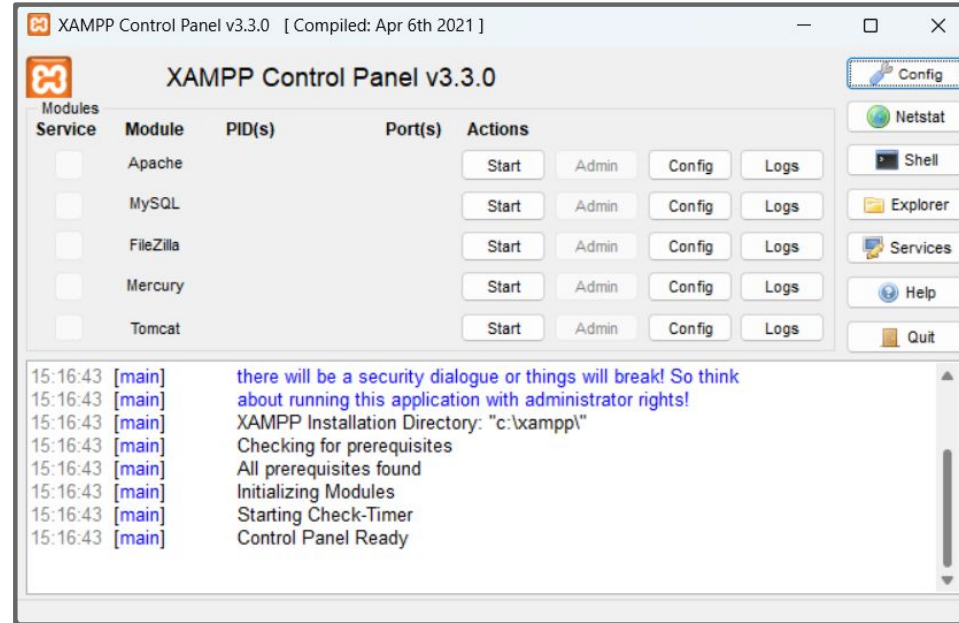
XAMPP

- 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

The screenshot displays the phpMyAdmin web interface for a MySQL server. The top navigation bar includes tabs for Databases, SQL, Status, User accounts, Export, Import, Settings, Replication, Variables,Charsets,Engines, and Plugins. The left sidebar shows a tree view of databases, including 'New', 'classicmodels', 'csv_db 6', 'information_schema', 'mysql', 'performance_schema', 'phpmyadmin', and 'test'. The main content area is divided into three sections: 'General settings', 'Appearance settings', and 'Database server'. The 'General settings' section shows the 'Server connection collation' set to 'utf8mb4_unicode_ci'. The 'Appearance settings' section shows the 'Language' set to 'English' and the 'Theme' set to 'pmahomme'. The 'Database server' section provides information about the server configuration, including the server version (10.4.32-MariaDB) and the user (root@localhost). The 'Web server' section lists the installed software, including Apache/2.4.58, OpenSSL/3.1.3, and PHP/8.0.30. The 'phpMyAdmin' section provides links to documentation, the official homepage, and other resources.

Server: 127.0.0.1

Databases SQL Status User accounts Export Import Settings Replication Variables Charsets Engines Plugins

Recent Favorites

New

- classicmodels
- csv_db 6
- information_schema
- mysql
- performance_schema
- phpmyadmin
- test

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.

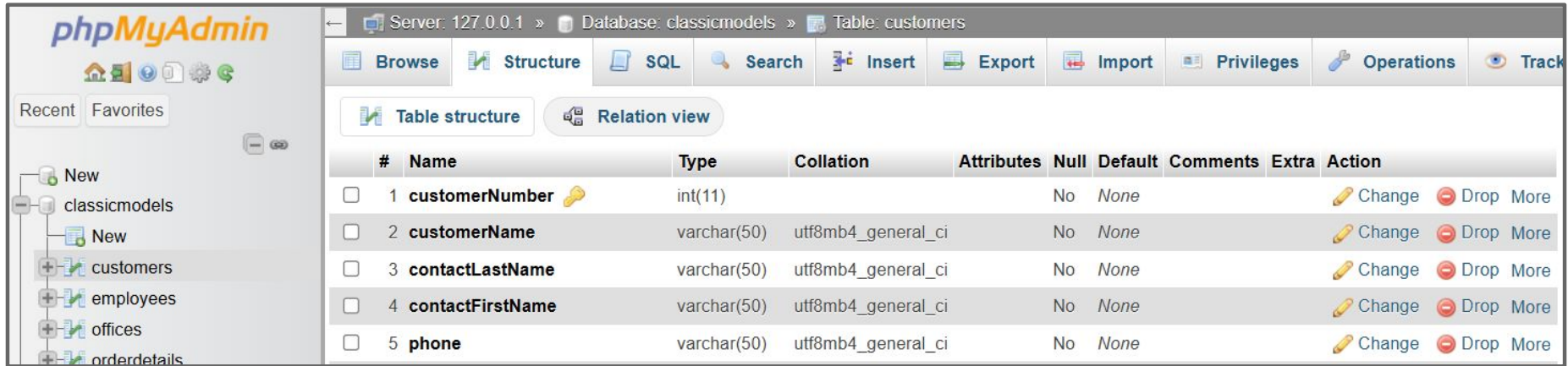


XAMPP

















- 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.




The screenshot shows the phpMyAdmin interface. On the left is a sidebar with a tree view of databases and tables. The 'customers' table is selected under the 'classicmodels' database. The main area displays the 'Table structure' view for the 'customers' table. At the top, there is a navigation bar with tabs: Browse, Structure (selected), SQL, Search, Insert, Export, Import, Privileges, Operations, and Track. Below the navigation bar, there are two buttons: 'Table structure' (selected) and 'Relation view'. The table structure is displayed in a table with the following columns: #, Name, Type, Collation, Attributes, Null, Default, Comments, Extra, and Action. The table contains five rows of data.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	customerNumber 	int(11)			No	None			 Change  Drop  More
<input type="checkbox"/> 2	customerName	varchar(50)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 3	contactLastName	varchar(50)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 4	contactFirstName	varchar(50)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 5	phone	varchar(50)	utf8mb4_general_ci		No	None			 Change  Drop  More

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.