PHP MySQL1, Basic SQL and XAMPP

System and Web Development Workshop

Spring 2025

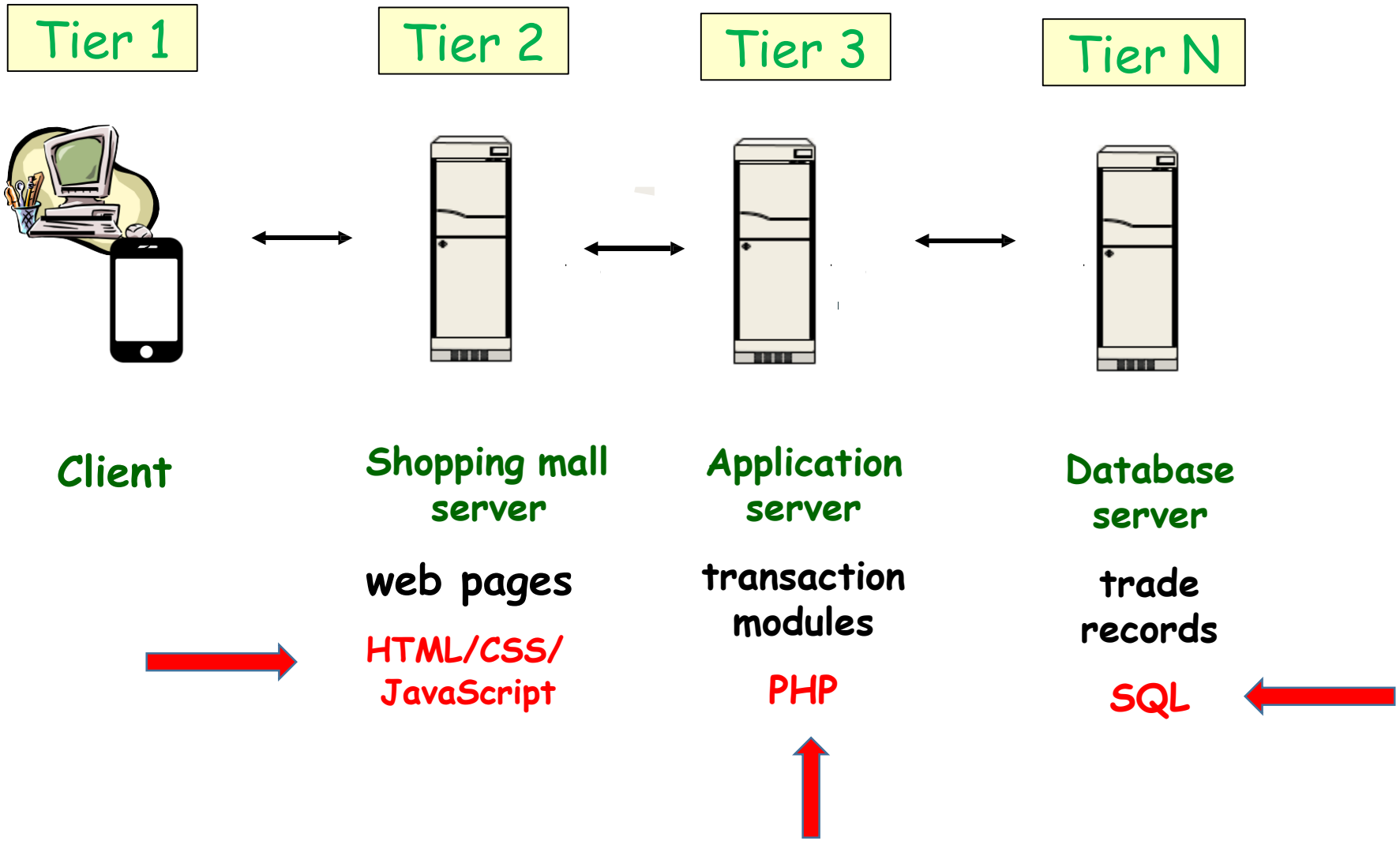
Heads Up on what will happen

- Assignment 2 is (was) due Tue April 8.
- Assignment 3 will be released after next week (Week 10).
- Test 2 will be held on the Week 13, right after Labor Day.

Outline

- What is MySQL
- Select – Where Query
- (I) Use online websites
- (II) Use the XAMPP database in your computer
- Class Exercise A
- Update and Insert Into Queries
- Class Exercise B
- (IIIA) Use the local XAMPP server in your compute
- Class Exercise C

Typical N-tier client / servers architecture of e-commerce



What is MySQL?

- MySQL
  - Is a database system commonly used on the web
  - Runs on a server to store, retrieve and modify info from a database
    - Is very fast, reliable, and easy to use
    - Is free to download and use
    - Uses standard SQL
    - Runs on a number of platforms
    - Is developed, distributed, and supported by Oracle Corporation
    - Is named after co-founder Monty Widenius's daughter named My

What is MySQL?

PHP + MySQL Database System

- PHP combined with MySQL are cross-platform
  - You can develop your code in Windows and serve it on a Unix platform.

- We only teach you the very basics of MySQL in this class.
  - In the Database Management System (DBMS) class next semester, you will thoroughly learn SQL and MySQL .

What is MySQL?

- Databases are useful for storing information by category.
- The data in a database are stored in tables.
  - A table is a collection of related data, and it consists of columns and rows.

- E.g. a company may have a database with the following tables:
  - Employees
  - Products
  - Customers
  - Orders

Demo Database, table name Customers

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico
4	Around the Horn	Thomas Hardy	120 Hanover Sq.	London	WA1 1DP	UK
5	Berglunds snabbköp	Christina Berglund	Berguvsvägen 8	Luleå	S-958 22	Sweden

Database Queries

- A query is a request for information.
- Consider

```
SELECT LastName FROM Employees
```

- This query selects all the data in the LastName column from the Employees table.

SQL Statements

- For this course we will focus on only three basic queries:
  - **Select** - retrieve data from the database
  - **Update** - edit the data in the database
  - **Insert into** - put data into the database
- You will learn more in the DBMS class.

SQL **SELECT** Statement

- The SELECT statement is used to select data from a table in a database.
- The data returned is stored as another table.
- SELECT Syntax

```
SELECT column1, column2,
...
FROM table_name;
```

- Here, column1, column2, ... are the field names of the table from which you want to select data.
- If you want to select all the fields available in the table, use the following syntax:

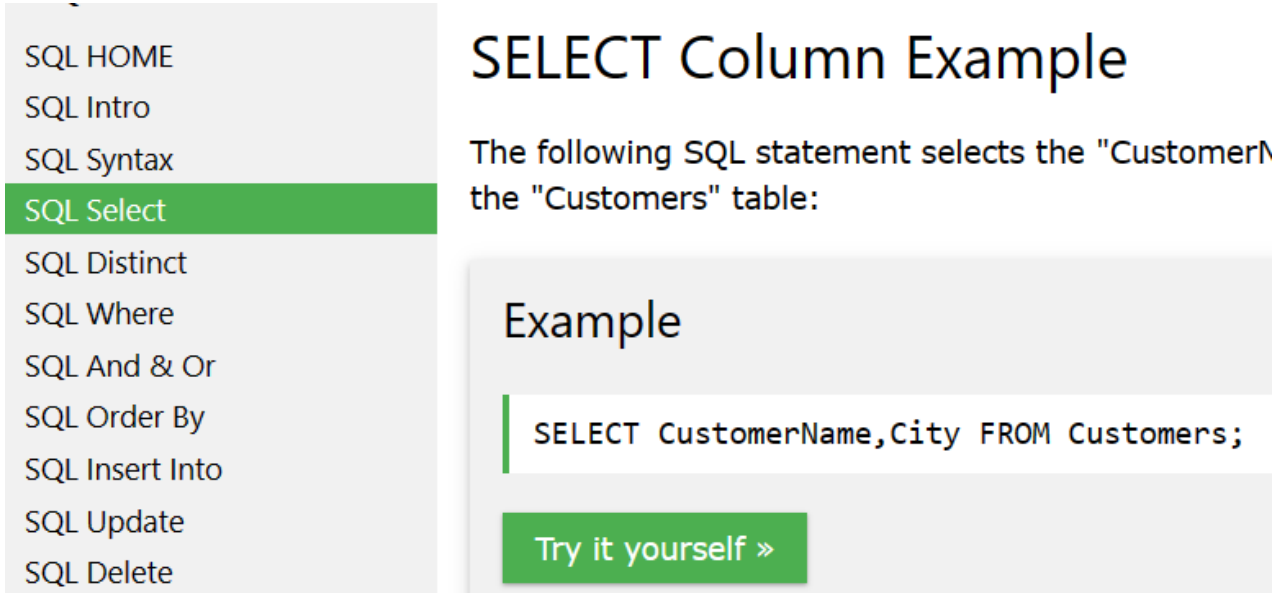
```
SELECT * FROM table_name;
```

Demo Database

- Try it yourself in
  - www.w3schools.com/sql/
  - www.w3schools.cn/sql/
  - www.w3ccoo.com/sql/
  - www.quanzhanketang.com/sql/sql_select.html
  - www.programiz.com/sql/online-compiler/

My Previous Experience
- Works at office and home PC
- Should work
- Didn't work sometimes
- nginx 404 sometimes
- Works!

- SELECT CustomerName, City FROM Customers;
- SELECT * FROM Customers;
- SELECT CustomerID, country FROM Customers

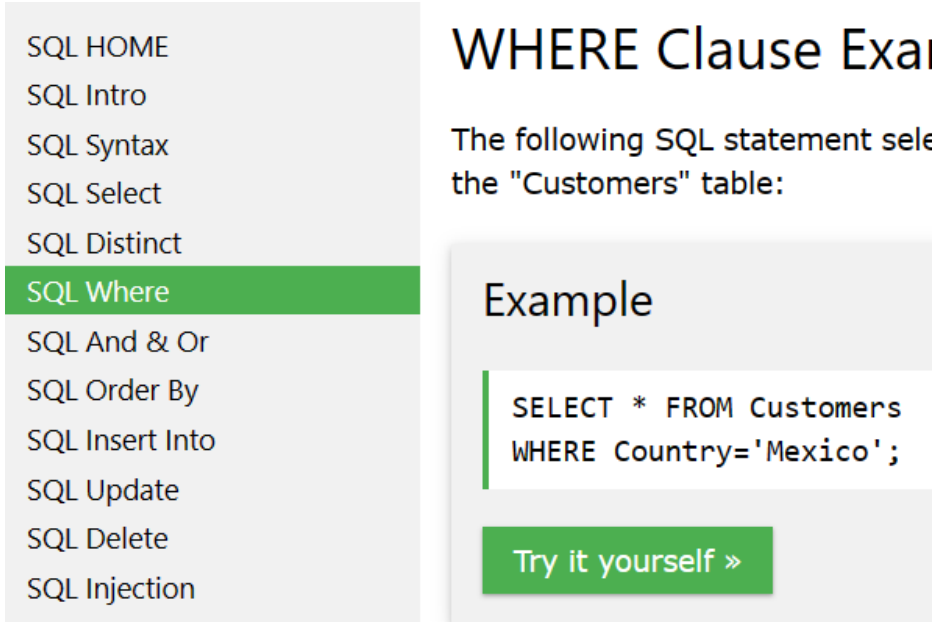


SQL WHERE Clause

- The **WHERE clause** is used to extract only those records that fulfil a specified condition.
- Syntax

```
SELECT column_name,column_name
FROM table_name
WHERE column_name operator value;
```

```
SELECT * FROM Customers
WHERE Country='Mexico';
```



- Try it yourself in https://www.w3schools.com/sql/sql_where.asp

Operators in the WHERE Clause

Operator	Description
=	Equal
<>	Not equal. **Note:** some versions of SQL uses !=
>	Greater than
<	Less than
>=	Greater than or equal
<=	Less than or equal
BETWEEN	Between an inclusive range
LIKE	Search for a pattern
IN	To specify multiple possible values for a column

There are 3 ways to do the SQL class exercises:

(I) Use online websites (such as W3 Schools).

(II) Use the XAMPP database in your computer.

(III) Use a server

(IIIA) Use the local XAMPP server in your computer

(IIIB) User the remote Bcrab server, in PHP_MySQL2.

- For SQL1 Class Exercise A (explained in a few slides later), you can use either (I) or (II) this week.
- After this week, you must use XAMPP in (II) and (III).
  - Need XAMPP for Assignment 3 and group projects.

(I) Use online website to do SQL

If you have not finished installing XAMPP:

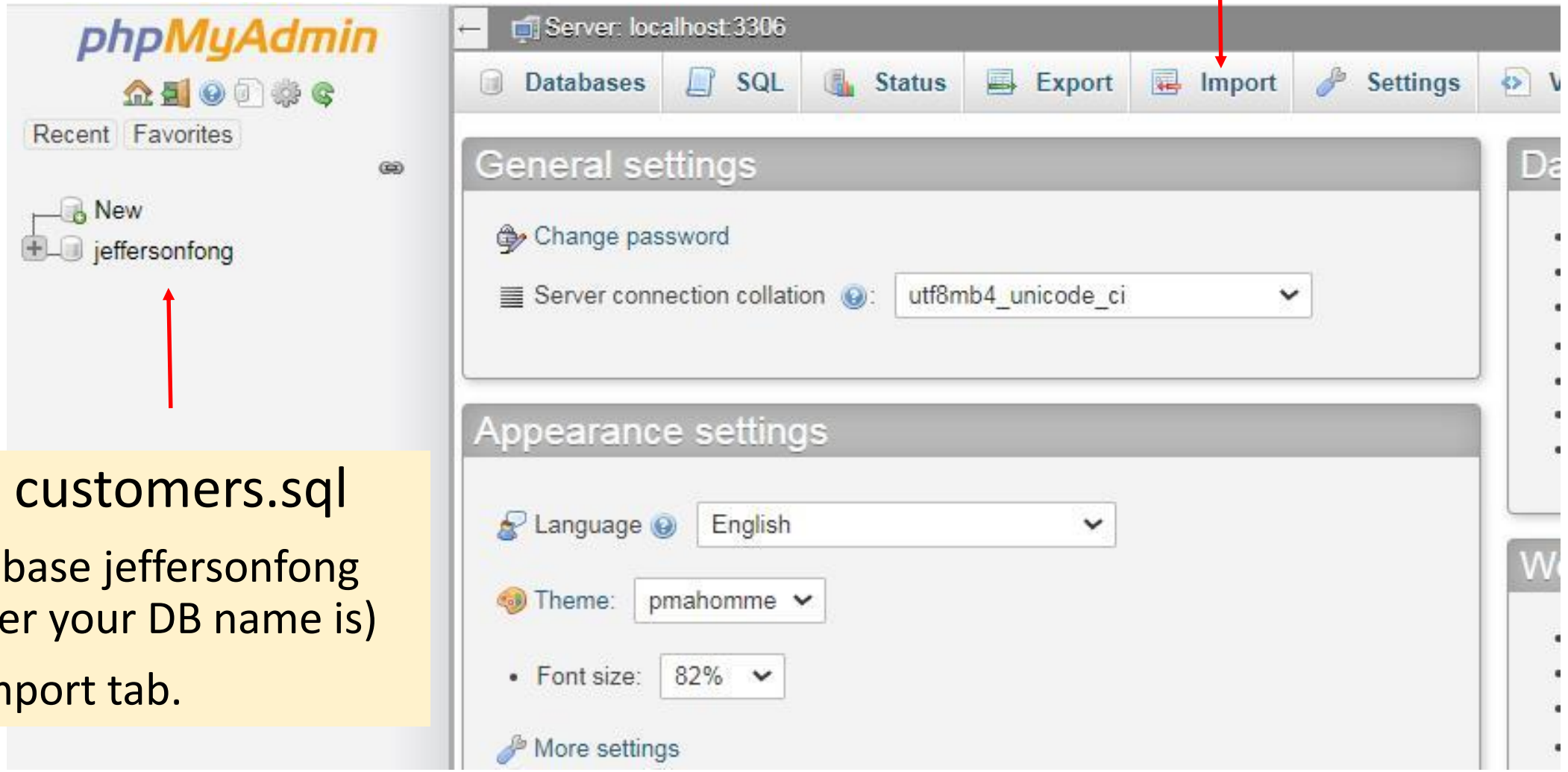
- Use these online sites to do the SQL class exercises
  - www.w3schools.com/sql/
  - www.w3schools.cn/sql/
  - www.quanzhanketang.com/sql
  - www.programiz.com/sql/online-compiler/ (if the above two sites don't work)
  - Copy the SQL commands to the file PhpMySql1_ClassEx.sql and submit.
  - Use an online site to do the SQL exercises only if you cannot get XAMPP to work this week.
  - Warning: don't be content in using online sites; finish setting up XAMPP in your own computer (or partner's computer).

(II) Use XAMPP in your computer to do SQL

If you have finished installing XAMPP:

- Follow XAMPP_installation_v1.docx
  - You have done 1. and 2. Download and install XAMPP to your computer
- 3. Start the XAMPP Control Panel
  - For Exercise A and B this week, you can use the SQL tab in XAMPP.
  - Next week when you use PHP files, put them in the htdoc folder; e.g. C:\xampp\htdocs
- 4. Open PhpMyAdmin to manage database
  - Download the database customers.sql from iSpace, and import customers.sql into XAMPP.
    - Next 3 slides has details.
  - Run SQL commands in the SQL tab.
    - About 4 slides later has details.
- Pretend you are making a website for your business or organization, and you are running the website on your computer.

(II) Use XAMPP in your computer to do SQL

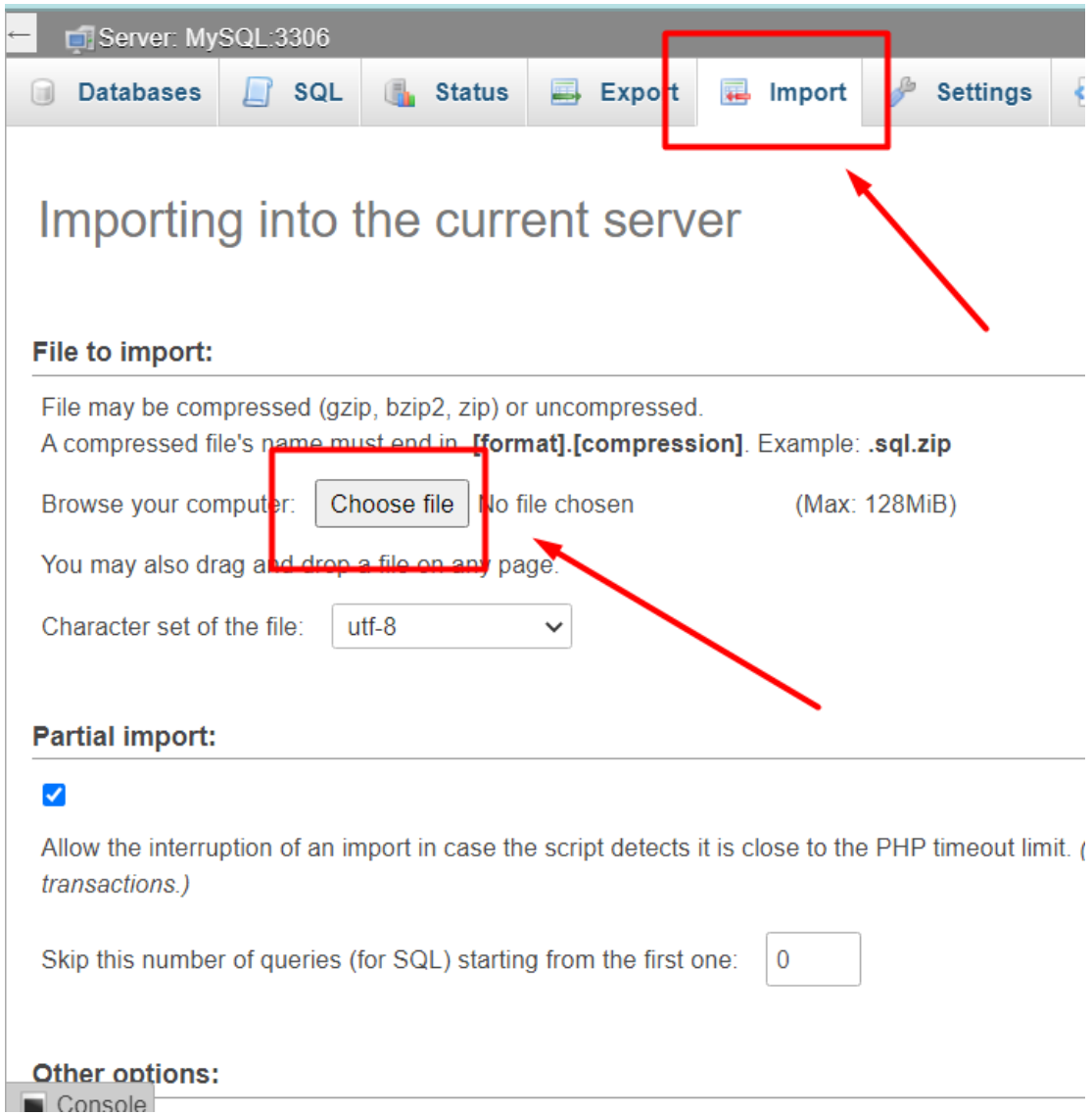


Uploading customers.sql

- Select database jeffersonfong (or whatever your DB name is)
- Click the Import tab.

(II) Use XAMPP in your computer to do SQL

- In the Import tab, click Choose file.
- Browse to customers.sql that you downloaded from iSpace.
- At the bottom of this tab, click Go; (not shown in this figure)

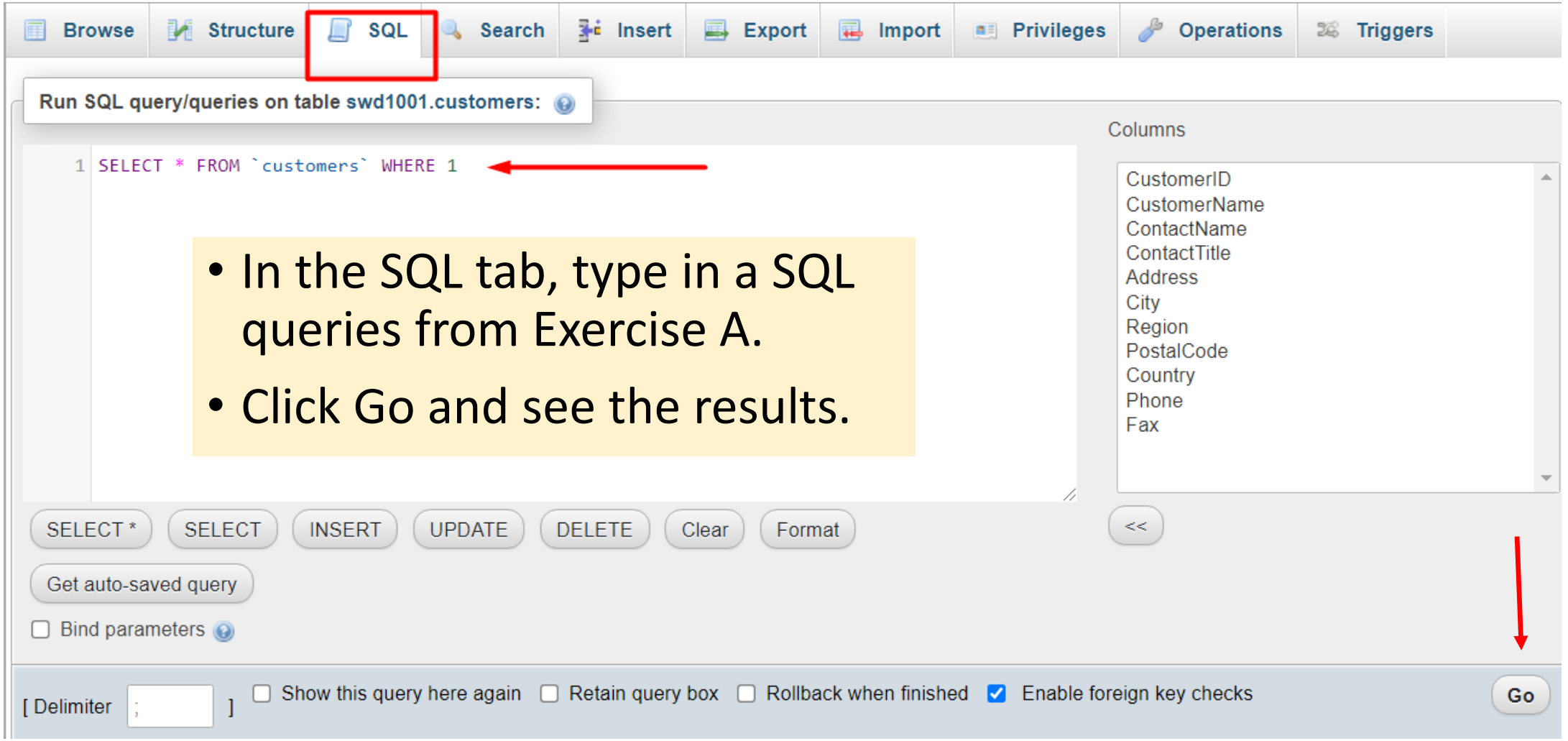


(II) Use XAMPP in your computer to do SQL

- This is He Jing's version, with the DB name alita (rather than jeffersonfong)
- Expand the database at left to see the customers table.

- MySQL is case sensitive.
- Here "customers" is in lower case.
- Maybe different in your computer.

(II) Use XAMPP in your computer to do SQL



- In the SQL tab, type in a SQL queries from Exercise A.
- Click Go and see the results.

SQL1 Class Exercise A

- Write SQL statements to do the following.
  - Partial solutions are in PhpMySql1_ClassExA_Start.sql.
  - Some of the following queries are done already in the partial solutions.
  - Fill in the missing SQL statements marked ‘ToDo:’ in the code.

1. List all CustomerName , ContactName, PostalCode
2. List all Addresses, Cities and Countries
3. List all
4. List all customer data in Germany

SQL1 Class Exercise A (continue)

5. List all Contact names and cities in UK
6. List all cities and contactname from UK and Germany
7. List all customerID from 23 to 34 inclusive
8. List all contactName starting from K up to starting with T

- Save the file as PhpMySql1_ClassExA.sql. Be ready to submit it with the rest of the SQL1 exercises.

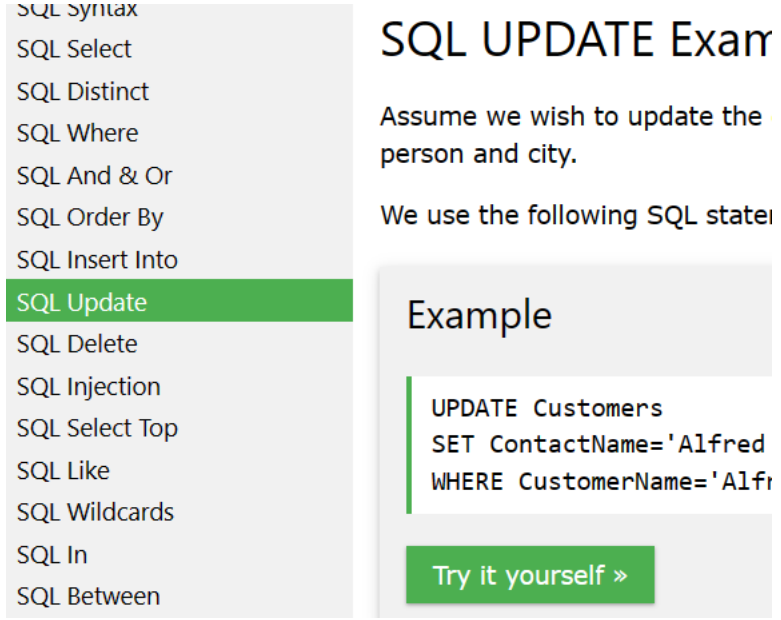
SQL UPDATE Statement

- The UPDATE statement is used to update existing records in a table.
- SQL UPDATE Syntax

```
UPDATE table_name
SET column1=value1,column2=value2,...
WHERE some_column=some_value;
```

- To update the customer "Alfreds Futterkiste" with a new contact person and city.

```
UPDATE Customers
SET ContactName='Alfred Schmidt',
City='Hamburg'
WHERE CustomerName='Alfreds Futterkiste';
```



SQL INSERT INTO Statement

- The INSERT INTO statement is used to insert new records in a table.
- SQL INSERT INTO Syntax

```
INSERT INTO table_name (column1,column2,column3,...)
VALUES (value1,value2,value3,...);
```

```
INSERT INTO Customers (CustomerName, ContactName,
Address, City, PostalCode, Country)
VALUES ('Cardinal','Tom B. Erichsen','Skagen 21',
'Stavanger','4006','Norway');
```

SQL Class Exercise B

Partial solutions are in PhpMySql1_ClassExB_Start.sql.

Fill in the missing SQL statements marked ‘ToDo:’ in the code.

- Insert into customers table:

1. Insert UIC , Jefferson, T3-601-R1, Zhuhai, 519000, China
2. Insert your own details

- Update the customers table:

3. Update Jefferson to Tessa
    - List all China records
4. Update Customer ID 91 CustomerName to Spiderman

- Save your file as PhpMySql1_ClassExB.sql.

(IIIA) Using DB with local server

Assume you have done these steps already in your XAMPP

- Finish installing XAMPP, according to XAMPP_installation_v0.1.docx
  - In the slide SQL Exercises (continue), see step 2 XAMPP local server
  - Put the PHP files in folder htdoc
    - E.g. C:\xampp\htdocs\php
- Import the database customers.sql into XAMPP, according to the instructions in XAMPP_installation_v0.1.docx
- After importing customer.sql, we can use a browser to go to http://localhost/php

(IIIA) Use the local XAMPP server in your computer

- Consider the samples codes in PhpMySql1_samples\localhost:
  - 01_connection_localhost.php
  - 02_select_localhost.php
  - 03_select_where_localhost.php

(IIIA) Use the local XAMPP server

- Open a Connection to MySQL

01_connection_localhost.php

Uncomment (1) when using local server.

Comment out (2) when using local server.

```
<?php
// Comment and uncomment the following for using DB in XAMPP
or db.bcrab.cn.

// (1) Using DB in local XAMPP server
$servername = "localhost";
$username    = "root";    // for local host
$password    = "";        // for local host
$db = “jeffersonfong";    // change to your own db name

// (2) Using DB in bcrab
//$servername = “stuweb.bcrab.cn";
//$username = "XXXXX";  // change XXXXX to your account's
//$password = "XXXXX";  // change XXXXX to your account's
//$db = “jeffersonfong"; // change to your own db name
```

(IIIA) Use the local XAMPP server

- Open a Connection to MySQL

01_connection_localhost.php

```php
// Create connection
$conn = new mysqli($servername, $username, $password);

// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}
echo "Connected successfully";
?>
```

- Put the file 01_connection_localhost.php in htdocs
  - E.g. in C:\xampp\htdocs\php\PhpMysql
- In a browser, go to localhost/php, click on this php.
  - Some servers require a port number; to figure out, click Admin in MySQL of the XAMPP control panel; note the port number of the web pages opened.

(IIIA) Use the local XAMPP server

02_select_localhost.php

- Set up a SQL query that selects the **CustomerID**, **CustomerName** and **City** columns from the **customers** table.
- The next line of code runs the query and puts the resulting data into a variable called ***$result***.
- Then, the function ***num_rows()*** checks if there are more than zero rows returned.
- If there are more than zero rows returned, the function ***fetch_assoc()*** puts all the results into an associative array that we can loop through.
- The while() loop loops through the result set and outputs the data from the CustomerID, CustomerName and City columns.

(IIIA) Use the local XAMPP server

02_select_localhost.php

- Set up an SQL query that selects the CustomerID, CustomerName and City columns from the **customers** table.

```
$sql = "SELECT CustomerID, CustomerName, City FROM customers";
```

- This line of code runs the query and puts the resulting data into a variable called **$result.**

```
$result = mysqli_query($conn, $sql);
```

(IIIA) Use the local XAMPP server

02_select_localhost.php

- Then, the function num_rows() checks if there are more than zero rows returned.

```
if (mysqli_num_rows($result) > 0)
```

- If there are more than **zero** rows returned, the function fetch_assoc() puts all the results into an **associative array ($row)** that we can loop through.

```
while($row = mysqli_fetch_assoc($result))
```

- If there are no rows:

```
else { echo "0 results"; }
```

(IIIA) Use the local XAMPP server

02_select_localhost.php

- The while() loop loops through the result set and outputs the data from the id, firstname and lastname columns.

```
while($row = mysqli_fetch_assoc($result)) {

        echo "id: " . $row["CustomerID"].
             " - Name: " . $row["CustomerName"].
             " -- City: " . $row["City"]. "<br>";
    }
```

(IIIA) Use the local XAMPP server

02_select_localhost.php

id: 1 - Name: Alfreds Futterkiste -- City: Berlin
id: 2 - Name: Ana Trujillo Emparedados y helados -- City: Mxico D.F.
id: 3 - Name: Antonio Moreno Taquera -- City: Mxico D.F.
id: 4 - Name: Around the Horn -- City: London
id: 5 - Name: Berglunds snabbkp -- City: Lule
id: 6 - Name: Blauer See Delikatessen -- City: Mannheim
id: 7 - Name: Blondesddsl pre et fils -- City: Strasbourg
id: 8 - Name: Blido Comidas preparadas -- City: Madrid
id: 9 - Name: Bon app' -- City: Marseille
id: 10 - Name: Bottom-Dollar Markets -- City: Tsawassen
id: 11 - Name: B's Beverages -- City: London
id: 12 - Name: Cactus Comidas para llevar -- City: Buenos Aires
id: 13 - Name: Centro comercial Moctezuma -- City: Mxico D.F.
id: 14 - Name: Chop-suey Chinese -- City: Bern
id: 15 - Name: Comrcio Mineiro -- City: Sao Paulo
id: 16 - Name: Consolidated Holdings -- City: London
id: 17 - Name: Drachenblut Delikatessen -- City: Aachen
id: 18 - Name: Du monde entier -- City: Nantes
id: 19 - Name: Eastern Connection -- City: London
id: 20 - Name: Ernst Handel -- City: Graz
id: 21 - Name: Familia Arquibaldo -- City: Sao Paulo
id: 22 - Name: FISSA Fabrica Inter. Salchichas S.A. -- City: Madrid
id: 23 - Name: Folies gourmandes -- City: Lille
id: 24 - Name: Folk och f HB -- City: Brcke

```
while($row = mysqli_fetch_assoc($result)) {
        echo "id: " . $row["CustomerID"].
             " - Name: " . $row["CustomerName"].
             " -- City: " . $row["City"]. "<br>";
    }
```

Class Exercise (IIIA)

- Make the previous code run in your local XAMPP server on your computer.
  - Next week, you will make these codes run in (IIIB) the bcrab server.
- Modify the sample codes from the localhost/ folder and put the modified codes in htdocs/php of your local XAMPP server
  - 01_connection_localhost.php
  - 02_select_localhost.php
  - 03_select_where_localhost.php
- Run the code with a browser in your computer.

Optional this week: ExC_local

Complete ExC_local.php with these requirements.

- See the intermediate solution ExC_local_start.php
- The form has 5 submit buttons
- Each button performs one of the following SQL Select queries.
  1. All Customer Details (by default)
  2. List CustomerName, ContactName and PostalCode
  3. List CustomerName, Country and City
  4. List all customer data in Poland
  5. List all Contact names and cities in London
- Next week will have this as required exercise on Bcrab server.
  - So we recommend you do some of this optional exercise if you have time.

Reference

- https://www.quanzhanketang.com/sql/sql_select.html
- https://www.w3ccoo.com/sql/
- For some reason, the above sites don't work at home, but works for He Jing. The following site works.
- https://www.programiz.com/sql/online-compiler/