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Welcome to SSL Day 4!

Models and Database Connections

Day 4

Server-Side Languages

First, set up a database

These examples will use a MySQL database.

You should set up a new database using the techniques you learned in DBS.

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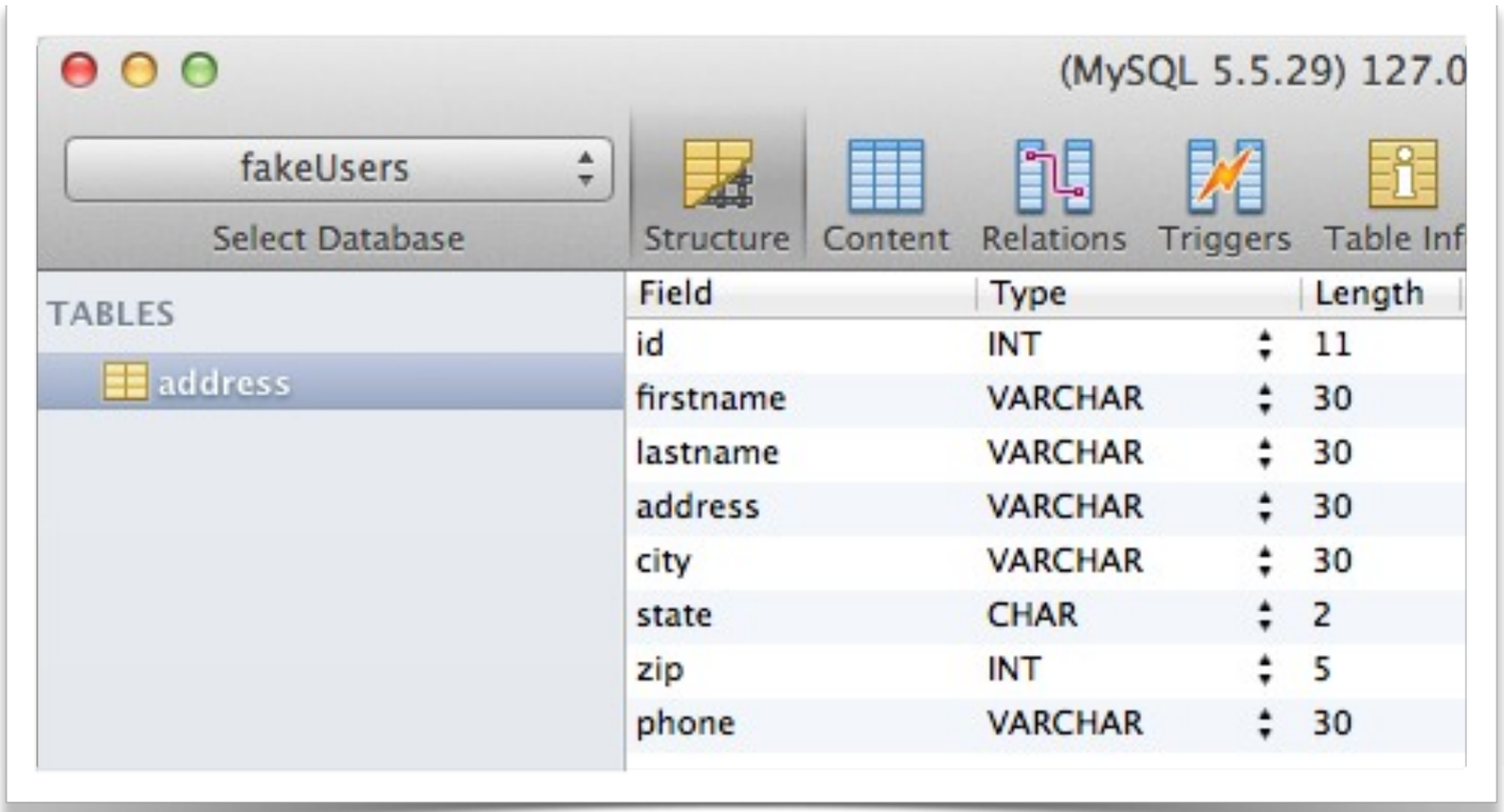
Server-Side Languages

In these examples, the database is called “fakeUsers”.



Functions in PHP

```php
<?php

function build_house($width, $length) {
    // build a house of size $width and $length
}

function build_neighborhood($num_houses) {
    for ($i=0; $i<$num_houses; $i++) {
        build_house(500, 800);
    }
}

build_neighborhood(25);

?>
```

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Server-Side Languages

Functions in Python

```
#!/usr/bin/python


def build_house(width, length):
    return "Build a house of size {} and {}." \
            .format(width, length)


def build_neighborhood(num_houses):
    for i in range(num_houses):
        print build_house(300, 500)

build_neighborhood(3)
```

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PHP Constructor

```php
<?php

class Builder {
    function __construct() {
        $this->phase = 1;
    }
}


$b = new Builder();
echo $b->phase;

?>
```

Python Constructor

```
#!/usr/bin/python


class Person:

    def __init__(self):
        self.species = "homosapien"
        self.age = 0

p = Person()
print p.species
```

Server-Side Languages

In-class assessment

- Build a class with at least one method
- The class should have a constructor method
- Instantiate the method from and print out information set in the constructor method.
- Do it in both languages.

Day 4

PHP DB Connection Model

The constructor function

```php
<?php

class DBConnector {

    private $db;

    function __construct() {
        $host = '127.0.0.1';
        $user = 'root';
        $pass = 'root';
        $port = '3306';
        $dbname = 'fakeUsers';
        $this->db = new PDO("mysql:host=$host;
                             port=$port;
                             dbname=$dbname",
                             $user, $pass);

    }
```

The port 3306 is Apache's default MySQL port.

If you're using MAMP, your port is probably 8889.

Using the PDO class, we can prevent SQL injection attacks.

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PHP DB Connection Model

Adding an entry

```
public function addUser($firstname='', $lastname='',
    $address='', $city='', $state='', $zip='', $phone='') {
        $stmnt = $this->db->prepare("insert into address
            (firstname, lastname, address, city, state, zip, phone)
            values (:firstname, :lastname, :address, :city, :state,
                :zip, :phone)");
        $stmnt->execute(array(
            ':firstname' => $firstname,
            ':lastname' => $lastname,
            ':address' => $address,
            ':city' => $city,
            ':state' => $state,
            ':phone' => $phone,
            ':zip' => $zip));
}
```

Inserting the values into the sql statement in this way will prevent SQL injection attacks.

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PHP DB Connection Model

Selecting a random entry

```
public function getRandomUser() {
    $stmnt = $this->db->query("select * from address
        order by rand() limit 1");
    return $stmnt->fetchAll(PDO::FETCH_ASSOC);
}
```

The directory structure

The index file would route a request to list all users to the user controller.

The user controller would include the database model and ask it for a list of users.

The user controller would call the correct view, and put the user information into it.

The user controller would then display the list of users to the web user.

Server-Side Languages

In-class assessment

Write a controller and database model in PHP, following the directory structure in the previous slide. The model should have a function that writes to the database and a function that reads from the database.

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Python DB Connection Model

The constructor function

```
#!/usr/bin/python

import mysql.connector


class DBConnector():

    def __init__(self):
        self.db = mysql.connector.connect(host="127.0.0.1",
                                          port=3306,
                                          user="root",
                                          passwd="root",
                                          db="fakeUsers")
```

Install this package from: http://goo.gl/RZS0n

The port 3306 is Apache's default MySQL port.

If you're using MAMP, your port is probably 8889.

Python DB Connection Model

Adding an entry

```
def add_user(self, fname='', lname='', address='',
             city='', state='', phone='', zip=''):

    sql = "insert into address (firstname, lastname, address,\
          city, state, zip, phone) values (%(fname)s, \
            %(lname)s, %(address)s, %(city)s, %(state)s,\
            %(zip)s, %(phone)s)"

    user_info = {
        'fname': fname,
        'lname': lname,
        'address': address,
        'city': city,
        'state': state,
        'zip': zip,
        'phone': phone
    }

    cursor = self.db.cursor()
    cursor.execute(sql, user_info)
    self.db.commit()
    cursor.close()
    self.db.close()
```

Usually, for example, when you're typing in the console window in Sequel Pro, a setting called "auto-commit" is turned on.

Otherwise, when you insert, update, or delete from a database, your changes aren't saved until you commit them.

Inserting the values into the sql statement in this way will prevent SQL injection attacks.

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Python DB Connection Model

Getting a random entry

```
def get_random_user(self):
    sql = "select firstname, lastname, city, state,\
            zip, phone from address order by rand() limit 1"

    cursor = self.db.cursor()
    cursor.execute(sql)
    for firstname, lastname, city, state, zip, phone in cursor:
        print("{} {} lives in {}, {} {} with phone number {}".format(
            firstname, lastname, city, state, zip, phone))
    cursor.close()
    self.db.close()
```

Server-Side Languages

In-class assessment

Write a controller and database model in Python, following the directory structure in the previous slide. The model should have a function that writes to the database and a function that reads from the database.

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Lab 4

Incorporate database CRUD functionality into each of your two websites. Both should have some reading and some writing interaction with your database.

Day 4