به نام خدا

Intro

MVC Nowruz Workshop

Presented by:

Scientific Society of Computer Engineering Students (SSCES), Bu-Ali Sina University (https://t.me/SSCES)

Instructor:

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Host:

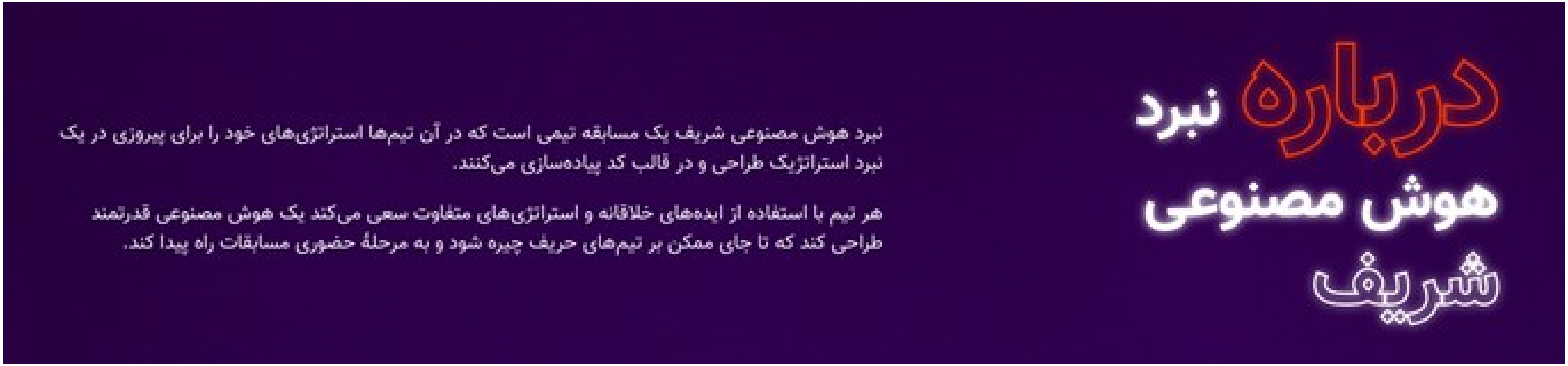
Skills Community (https://skills.community)

Mission: Implementation of a Robot Fighting Platform

Before letting your minds go crazy, let me notice that it will not be like:

(https://hypebeast.com/2019/8/youtube-robot-fighting-animal-cruelty-confusion)

Idea

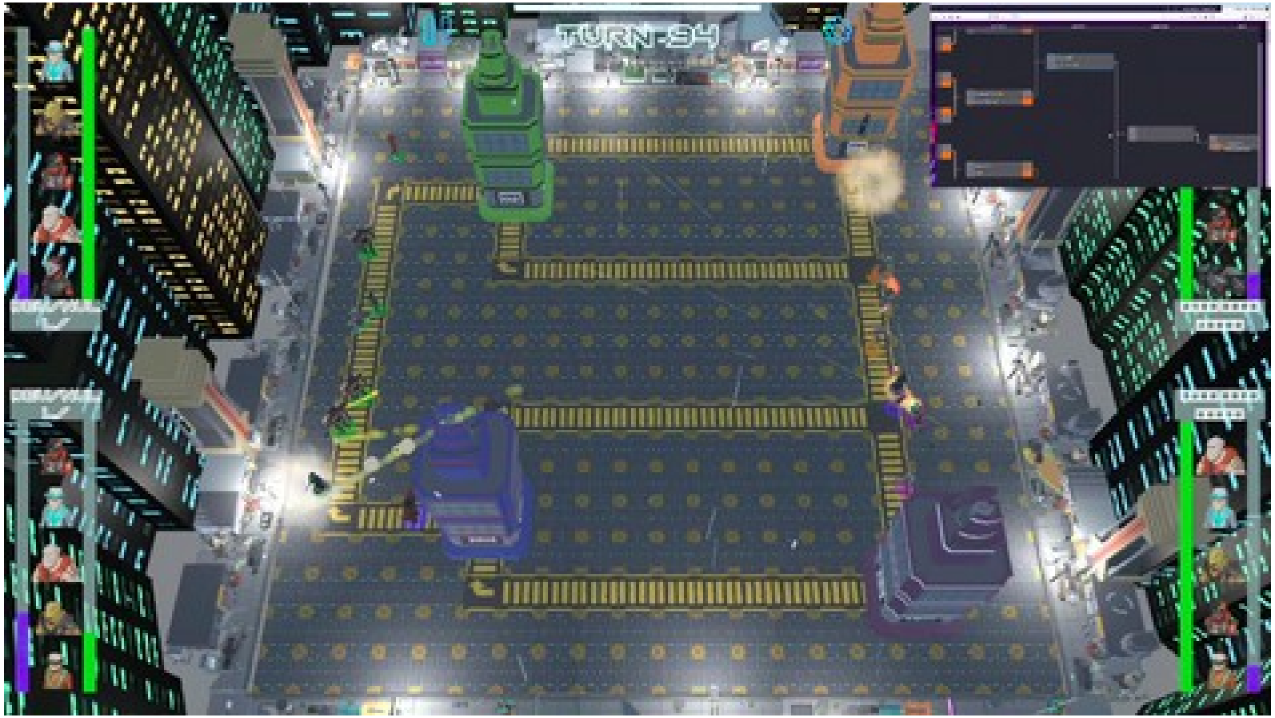


درباره نبرد
هوش مصنوعی
شریف

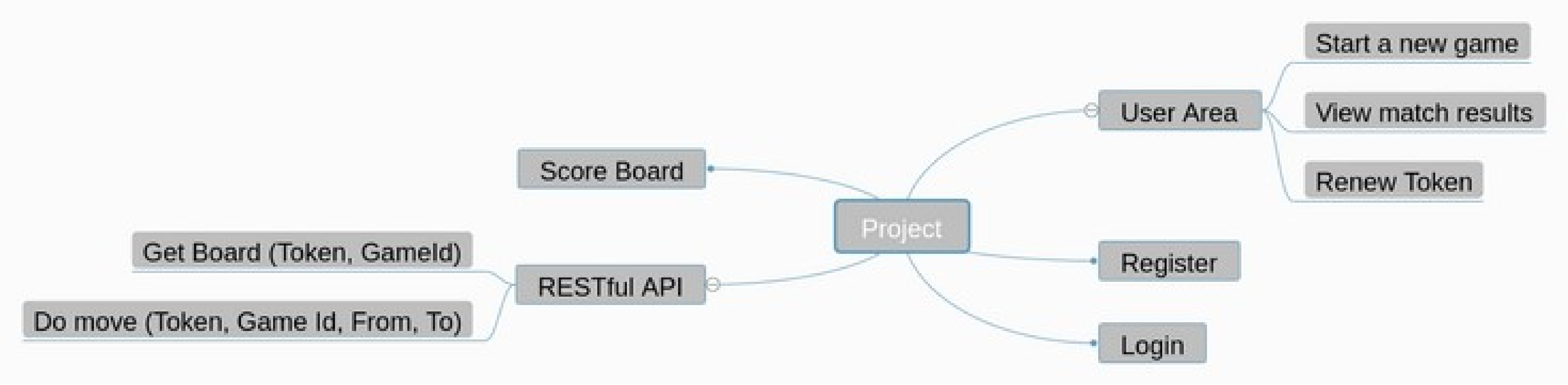
نبرد هوش مصنوعی شریف یک مسابقه تیمی است که در آن تیم‌ها استراتژی‌های خود را برای پیروزی در یک نبرد استراتژیک طراحی و در قالب کد پیاده‌سازی می‌کنند.

هر تیم با استفاده از ایده‌های خلاقانه و استراتژی‌های متفاوت سعی می‌کند یک هوش مصنوعی قدرتمند طراحی کند که تا جای ممکن بر تیم‌های حریف چیره شود و به مرحلهٔ حضوری مسابقات راه پیدا کند.

Idea



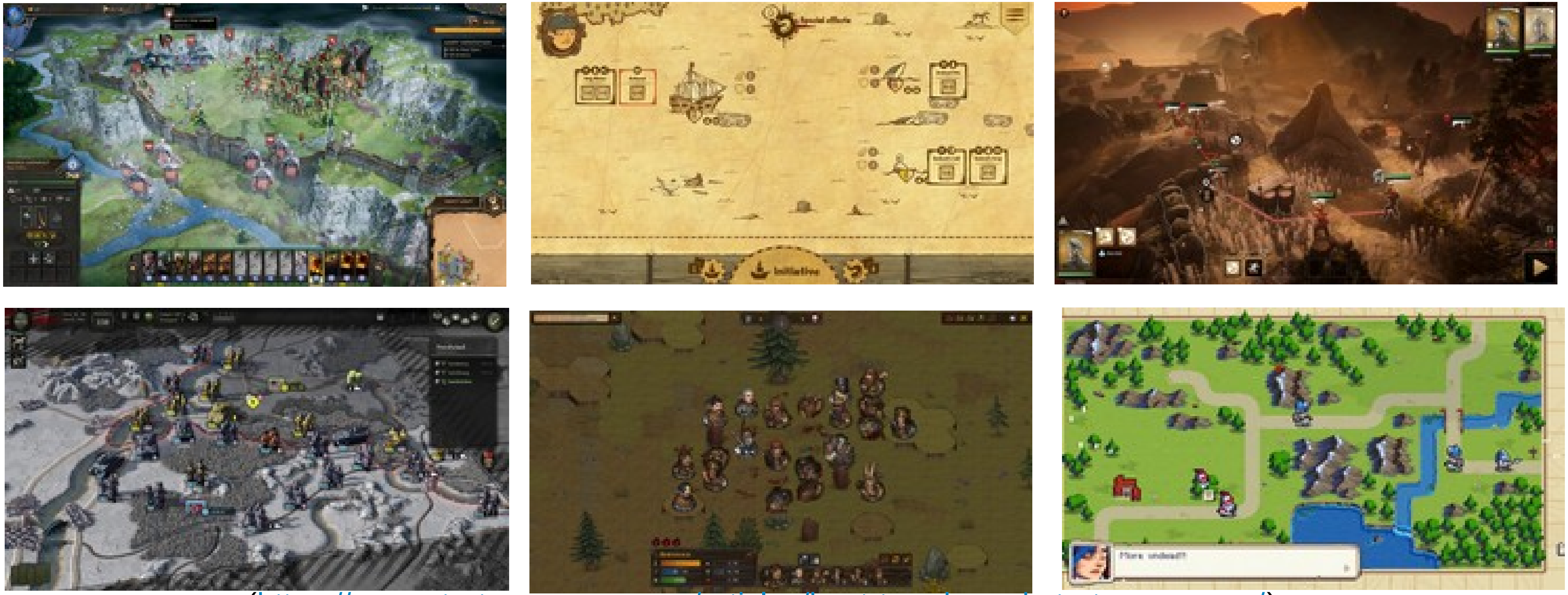
Project map



(https://skills.community/index.php/f/2146)

Game subject

It’s a simple turn-based strategy game



(https://www.strategygamer.com/articles/best-turn-based-strategy-games/)

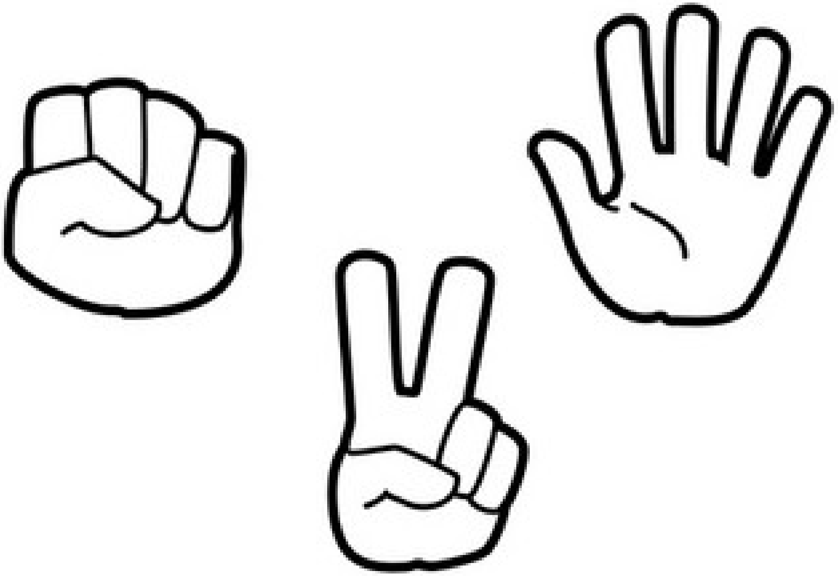
Game subject

(Maybe chess)

(https://gist.github.com/tayyebi/00496bb6ab54ab85c2ecbc765554c8ca)

Game subject

(Definitely Rock-Paper-Scissors => RPS)



(https://ac-illust.com/en/clip-art/136730/rock-paper-scissors)

Repository

https://github.com/tayyebi/BASU-MVC-99

Session 1

(Fundamentals)

I know there is a reason behind MVC, but what the why?

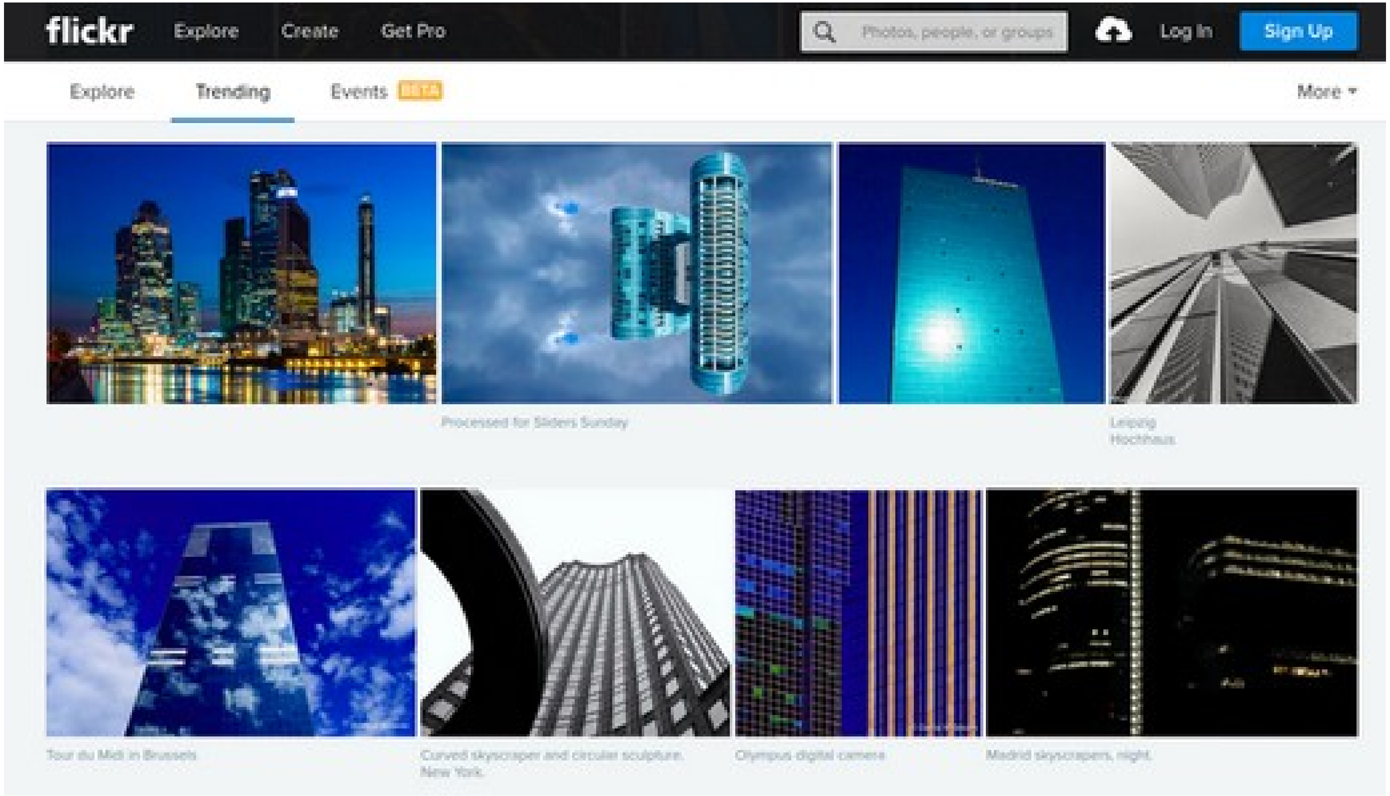
- **Simultaneous development — Multiple developers can work simultaneously on the model, controller and views.**
- **High cohesion — MVC enables logical grouping of related actions on a controller together. The views for a specific model are also grouped together.**
- **Low coupling — The very nature of the MVC framework is such that there is low coupling among models, views or controllers.**

I know there is a reason behind MVC, but what the why?

- Ease of modification — Because of the separation of responsibilities, future development or modification is easier i.e. scalability of the product is increased.
- Multiple views for a model — Models can have multiple views.

(src: medium.com/@socraticsol)

MVC, ~~like a~~ *for the* BOSS



Processed for Sliders Sunday

Leipzig
Hochhaus

Tour du Midi in Brussels

Curved skyscraper and circular sculpture.
New York.

Olympus digital camera

Madrid skyscrapers, night.

MVC, ~~like a~~ *for the* BOSS

My Boss arrived at work in a brand new Ferrari.

I told him: “Wow that’s a nice car”.

“If you work hard, put all your hours in, and strive for Excellence, I'll get another one next year”, He replied!

Design Pattern \vs/ Architecture

(I’m a peace fan)

A system can have multiple levels and scope:

I. Function- implementation of a function

II. Class- implementation of a class

III. Project- relations between classes

IV. Solution- relations between projects

V. System- relations between solutions

Architecture is the highest level design of a solution as a whole. Usually, you think big there, as you don't go too much into details of different components. Architecture ensures that different parts of solution can easily talk with one another either directly or through a mediator, it concerns security, performance, non functional deployment and system requirements. Architecture takes care of 4 and 5 scopes and sometimes 3.

(www.quora.com/profile/Almantas-Karpavičius)

Design Patterns and Their Usage

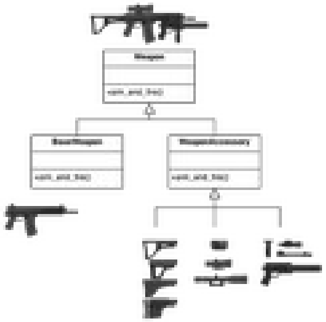
A system can have multiple levels and scope:

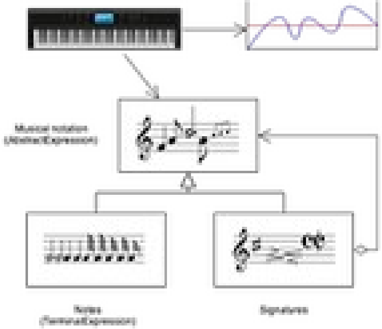
I. Structural Design Patterns

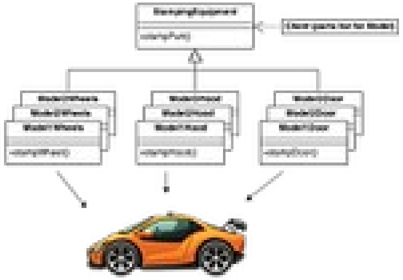
II. Behavorial Design Patterns

III. Creational Design Patterns

(https://sourcemaking.com/design_patterns)

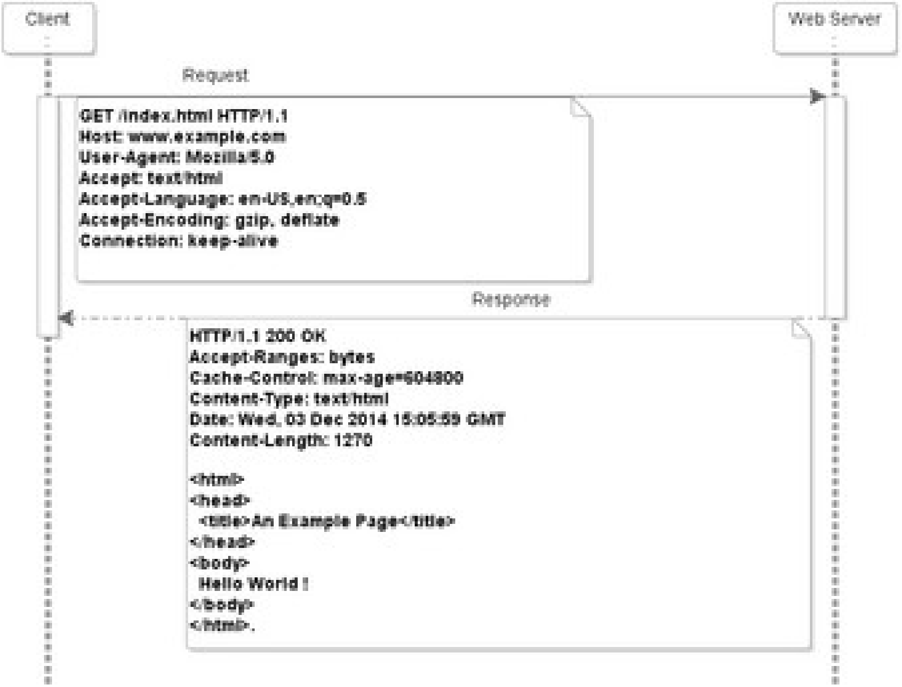






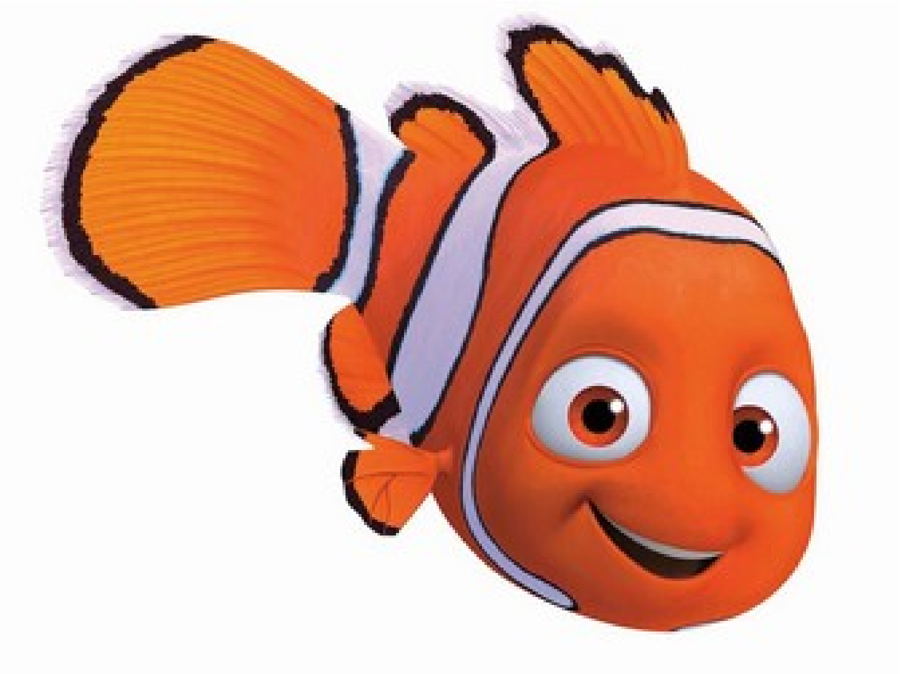
What happens to your HTTP request?

(Bottom to top approach)



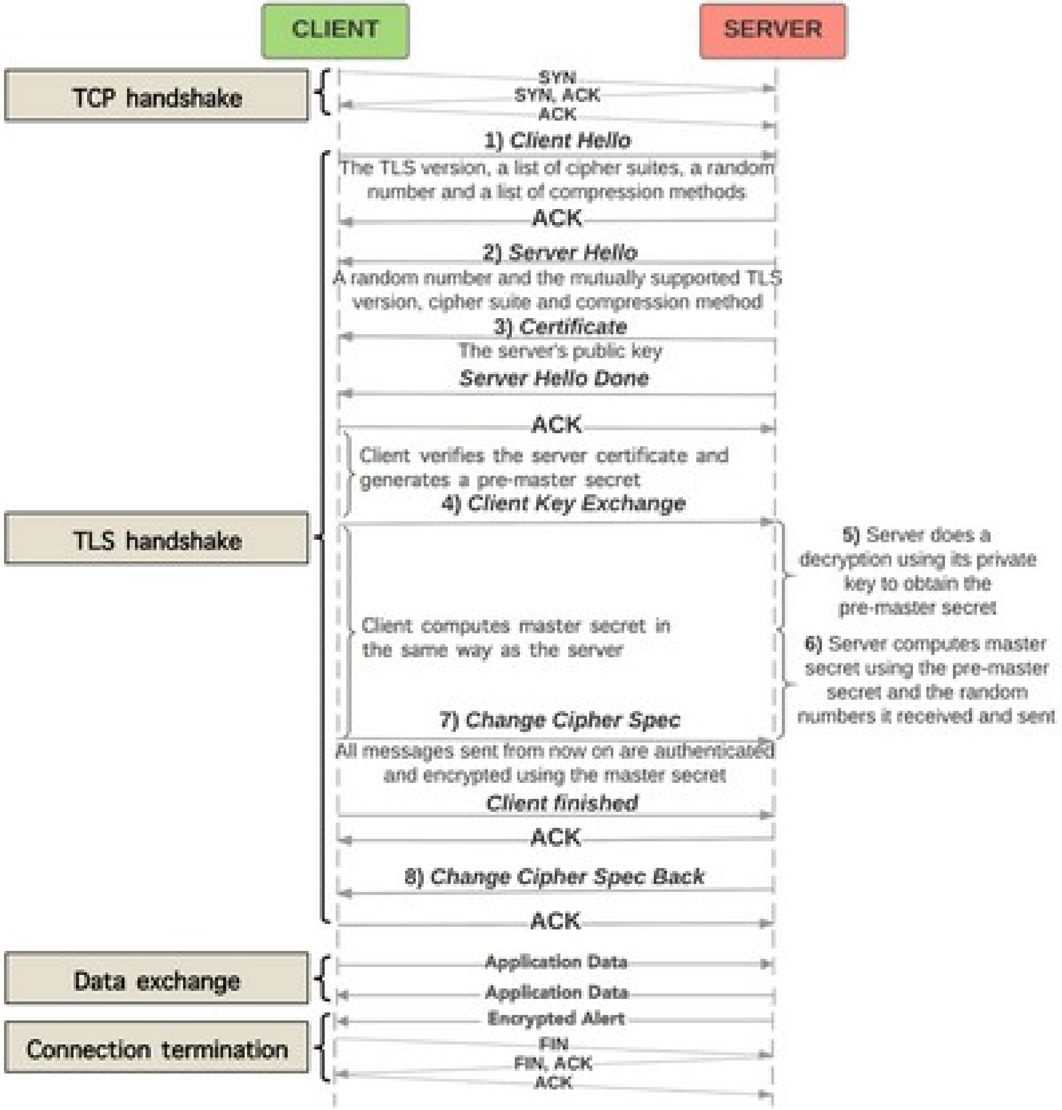
```
GET /index.html HTTP/1.1
Host: www.example.com
User-Agent: Mozilla/5.0
Accept: text/html
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: keep-alive
```

```
HTTP/1.1 200 OK
Accept-Ranges: bytes
Cache-Control: max-age=604800
Content-Type: text/html
Date: Wed, 03 Dec 2014 15:05:59 GMT
Content-Length: 1270

<html>
<head>
  <title>An Example Page</title>
</head>
<body>
  Hello World !
</body>
</html>.
```



(https://www.oreilly.com/library/view/restful-java-web/9781788294041/1889f99d-f907-41c3-a0f0-925bbf1d3825.xhtml)

Finding Nemo (Network Segments)


CLIENT
SERVER
TCP handshake
SYN
SYN, ACK
ACK
1) Client Hello
The TLS version, a list of cipher suites, a random number and a list of compression methods
ACK
2) Server Hello
A random number and the mutually supported TLS version, cipher suite and compression method
3) Certificate
The server's public key
Server Hello Done
ACK
Client verifies the server certificate and generates a pre-master secret
4) Client Key Exchange
TLS handshake
5) Server does a decryption using its private key to obtain the pre-master secret
6) Server computes master secret using the pre-master secret and the random numbers it received and sent
Client computes master secret in the same way as the server
7) Change Cipher Spec
All messages sent from now on are authenticated and encrypted using the master secret
Client finished
ACK
8) Change Cipher Spec Back
ACK
Data exchange
Application Data
Application Data
Connection termination
Encrypted Alert
FIN
FIN, ACK
ACK

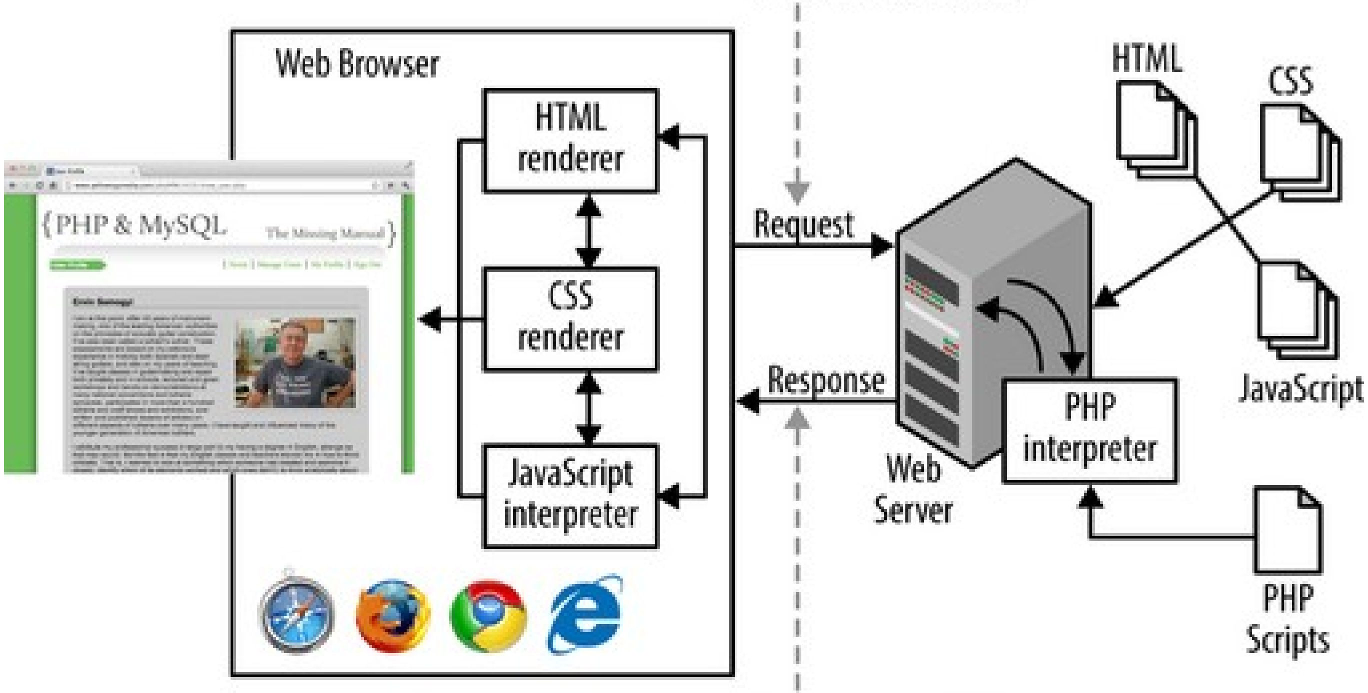
(https://www.researchgate.net/figure/HTTPS-message-sequence-diagram-with-detailed-TLS-handshaking-steps_fig1_306187575)

Finding Nemo (System Layers)

Business Layer	Business Process	Our Business Process
Application Layer	Applications	Our program
Infrastructure Layer	Middleware	Apache + MySQL + PHP
	OS	Linux / Windows Server
	Hardware	Intel CPU + HDD + SSD + RAM

Finding Nemo (Web Server)

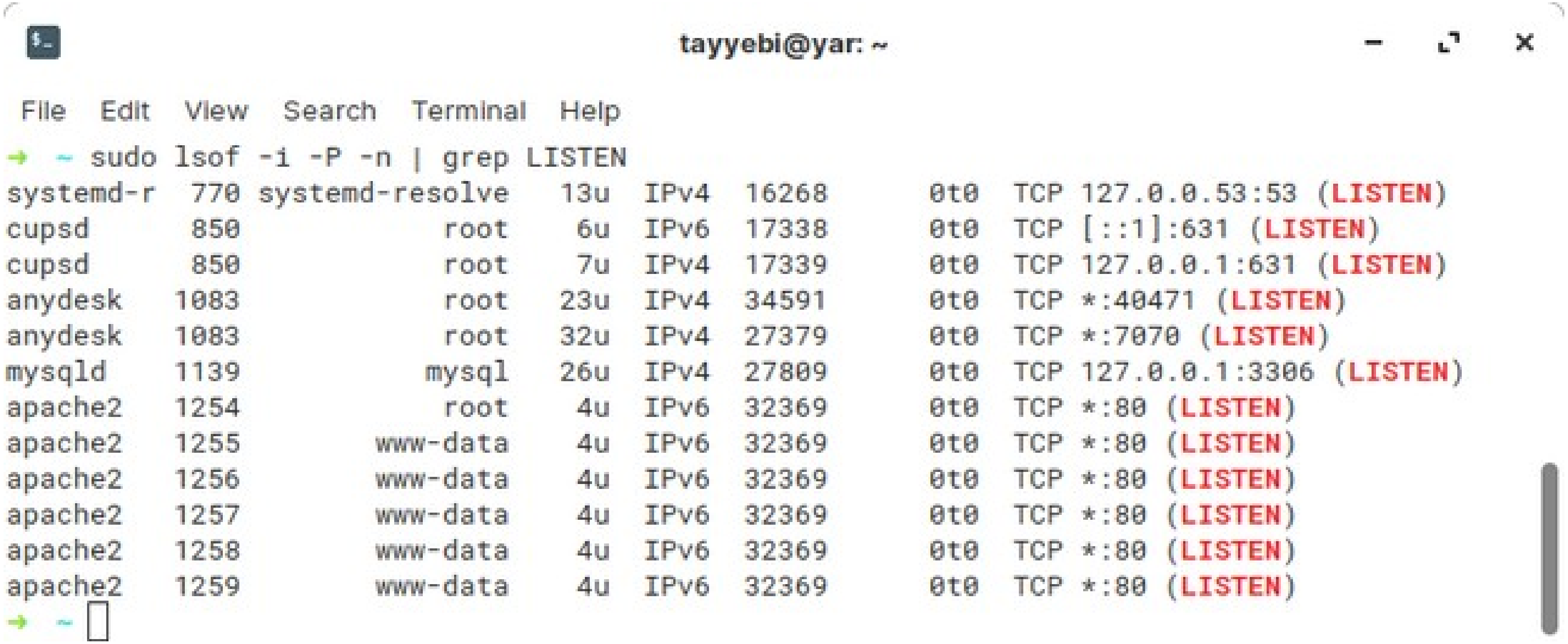
Could be for HTML, CSS, PHP or a combination.



Response is not PHP, but the result of interpreting PHP, usually more HTML and CSS.

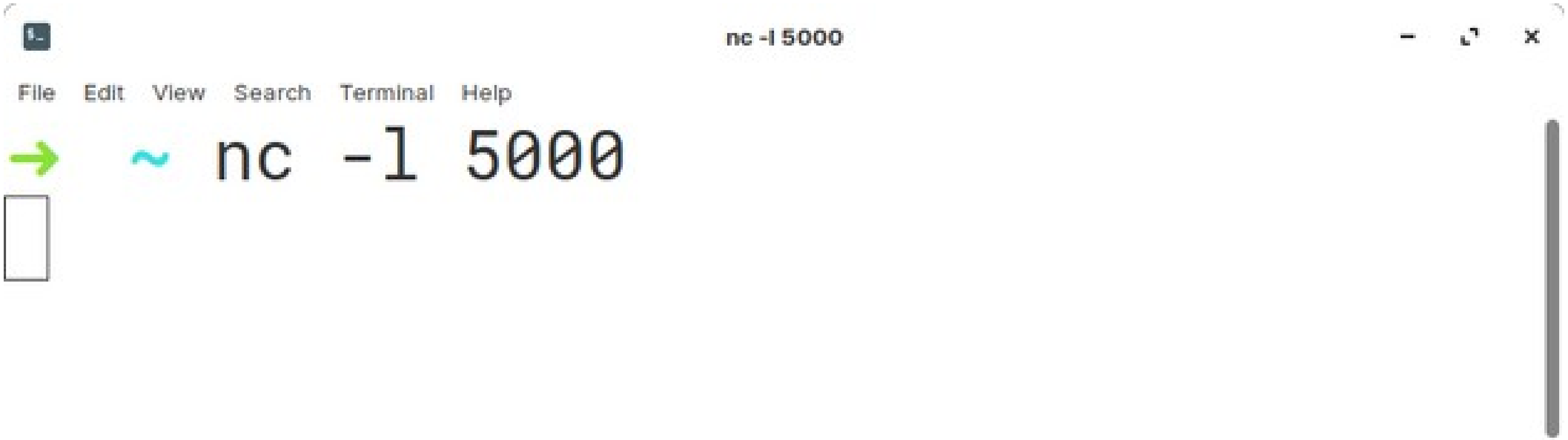
(https://www.oreilly.com/library/view/php-mysql/9781449355517/ch01.html)

A server usually listens on a port



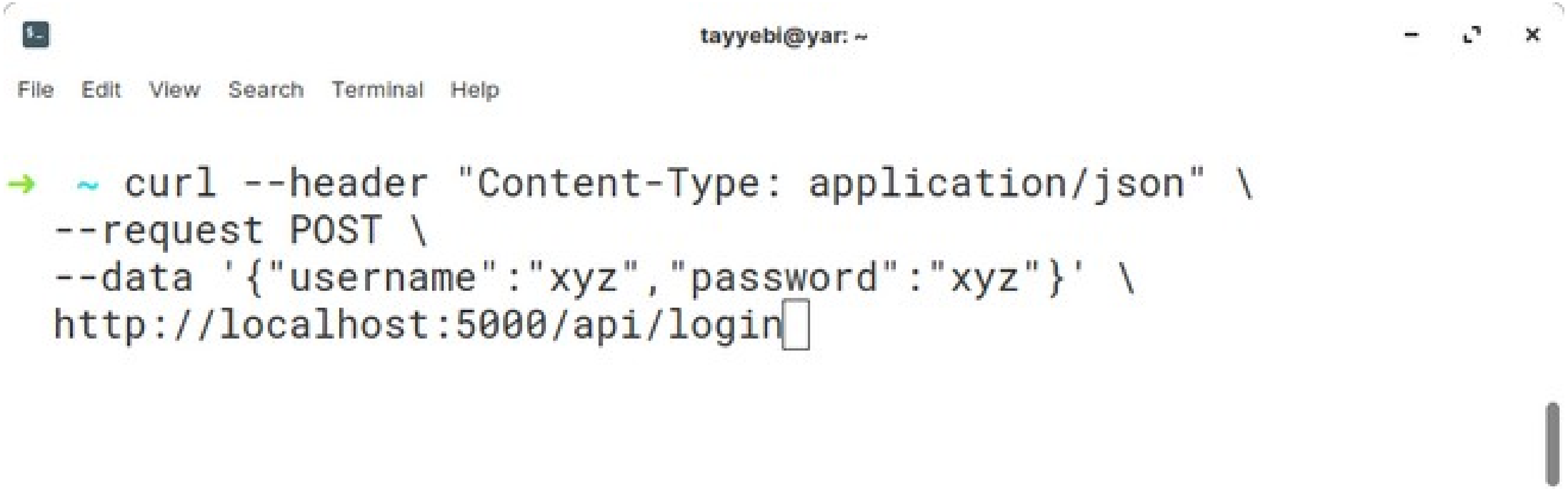
```
➜  ~ sudo lsof -i -P -n | grep LISTEN
systemd-r   770 systemd-resolve   13u  IPv4  16268      0t0  TCP 127.0.0.53:53 (LISTEN)
cupsd       850            root    6u  IPv6  17338      0t0  TCP [::1]:631 (LISTEN)
cupsd       850            root    7u  IPv4  17339      0t0  TCP 127.0.0.1:631 (LISTEN)
anydesk    1083            root   23u  IPv4  34591      0t0  TCP *:40471 (LISTEN)
anydesk    1083            root   32u  IPv4  27379      0t0  TCP *:7070 (LISTEN)
mysqld     1139           mysql   26u  IPv4  27809      0t0  TCP 127.0.0.1:3306 (LISTEN)
apache2    1254            root    4u  IPv6  32369      0t0  TCP *:80 (LISTEN)
apache2    1255        www-data    4u  IPv6  32369      0t0  TCP *:80 (LISTEN)
apache2    1256        www-data    4u  IPv6  32369      0t0  TCP *:80 (LISTEN)
apache2    1257        www-data    4u  IPv6  32369      0t0  TCP *:80 (LISTEN)
apache2    1258        www-data    4u  IPv6  32369      0t0  TCP *:80 (LISTEN)
apache2    1259        www-data    4u  IPv6  32369      0t0  TCP *:80 (LISTEN)
➜  ~ 
```

That can be as simple as



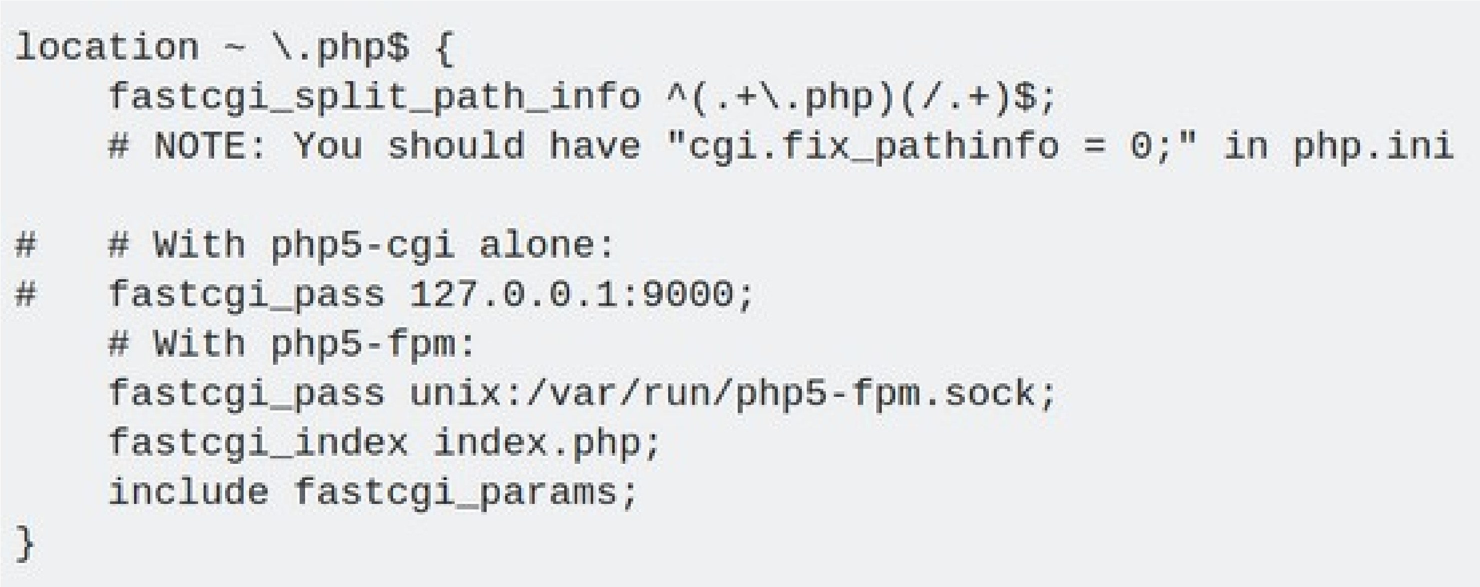
```
→  ~ nc -l 5000
```

A client can be as simple as



```
➜  ~ curl --header "Content-Type: application/json" \
  --request POST \
  --data '{"username":"xyz","password":"xyz"}' \
  http://localhost:5000/api/login
```

Finding Nemo (Web Server)



```
location ~ \.php$ {
    fastcgi_split_path_info ^(.+\.php)(/.+)$;
    # NOTE: You should have "cgi.fix_pathinfo = 0;" in php.ini

#   # With php5-cgi alone:
#   fastcgi_pass 127.0.0.1:9000;
    # With php5-fpm:
    fastcgi_pass unix:/var/run/php5-fpm.sock;
    fastcgi_index index.php;
    include fastcgi_params;
}
```

(https://askubuntu.com/questions/134666/what-is-the-easiest-way-to-enable-php-on-nginx)

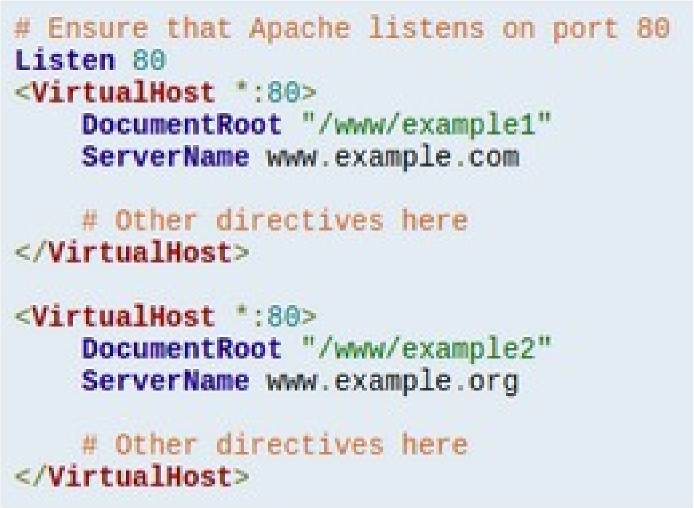
Finding Nemo (VirtualHost)

Virtual hosting is a method for hosting multiple domain names (with separate handling of each name) on a single server (or pool of servers). This allows one server to share its resources, such as memory and processor cycles, without requiring all services provided to use the same host name. The term virtual hosting is usually used in reference to web servers but the principles do carry over to other internet services.

- Name-based
- IP-based
- Port-based

(https://en.wikipedia.org/wiki/Virtual_hosting,

https://httpd.apache.org/docs/2.4/vhosts/examples.html)



```
# Ensure that Apache listens on port 80
Listen 80
<VirtualHost *:80>
    DocumentRoot "/www/example1"
    ServerName www.example.com

    # Other directives here
</VirtualHost>

<VirtualHost *:80>
    DocumentRoot "/www/example2"
    ServerName www.example.org

    # Other directives here
</VirtualHost>
```

Finding Nemo (HTTP Methods)

- GET

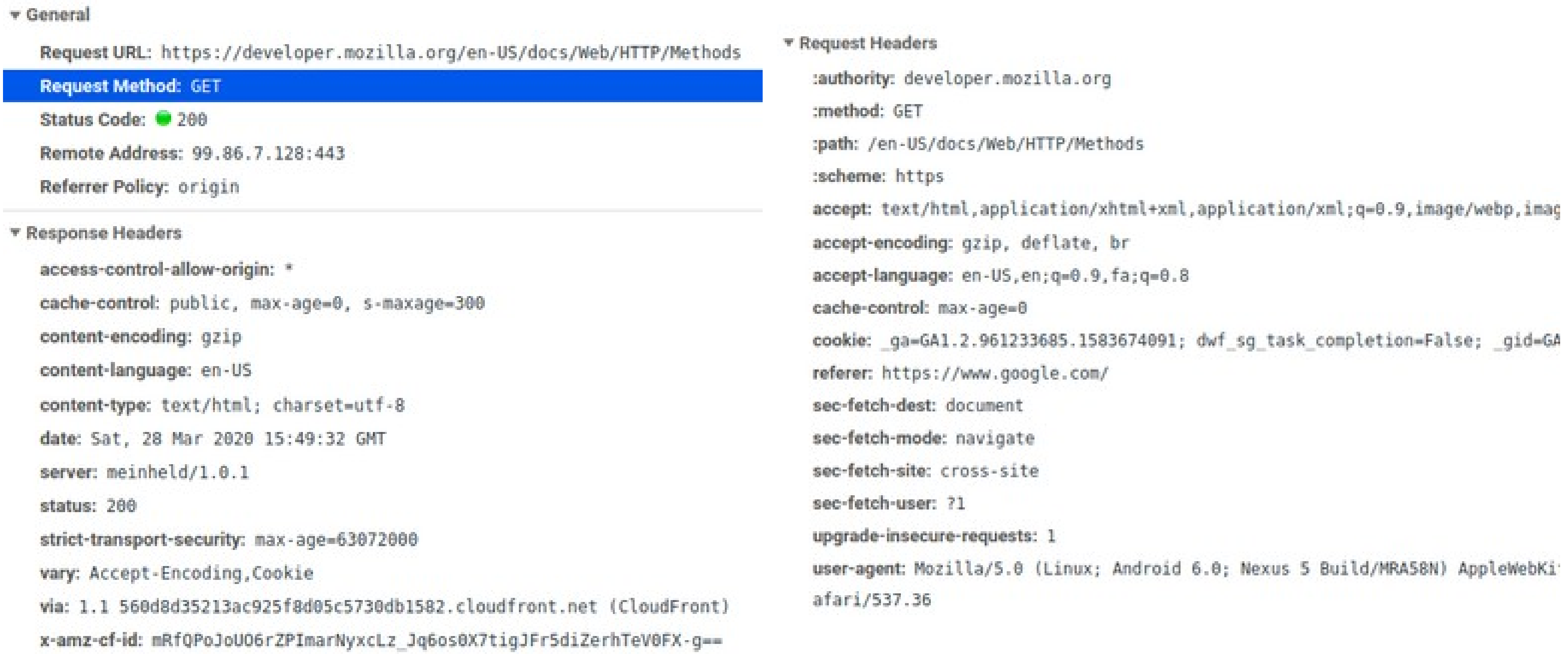
  The GET method requests a representation of the specified resource. Requests using GET should only retrieve data.

- POST

  The POST method is used to submit an entity to the specified resource, often causing a change in state or side effects on the server.

(https://developer.mozilla.org/en-US/docs/Web/HTTP/Methods)

Finding Nemo (HTTP Methods)



```
▾ General
  Request URL: https://developer.mozilla.org/en-US/docs/Web/HTTP/Methods
  Request Method: GET
  Status Code: ● 200
  Remote Address: 99.86.7.128:443
  Referrer Policy: origin

▾ Response Headers
  access-control-allow-origin: *
  cache-control: public, max-age=0, s-maxage=300
  content-encoding: gzip
  content-language: en-US
  content-type: text/html; charset=utf-8
  date: Sat, 28 Mar 2020 15:49:32 GMT
  server: meinheld/1.0.1
  status: 200
  strict-transport-security: max-age=63072000
  vary: Accept-Encoding,Cookie
  via: 1.1 560d8d35213ac925f8d05c5730db1582.cloudfront.net (CloudFront)
  x-amz-cf-id: mRfQPoJoUO6rZPImarNyxcLz_Jq6os0X7tigJFr5diZerhTeV0FX-g==
```

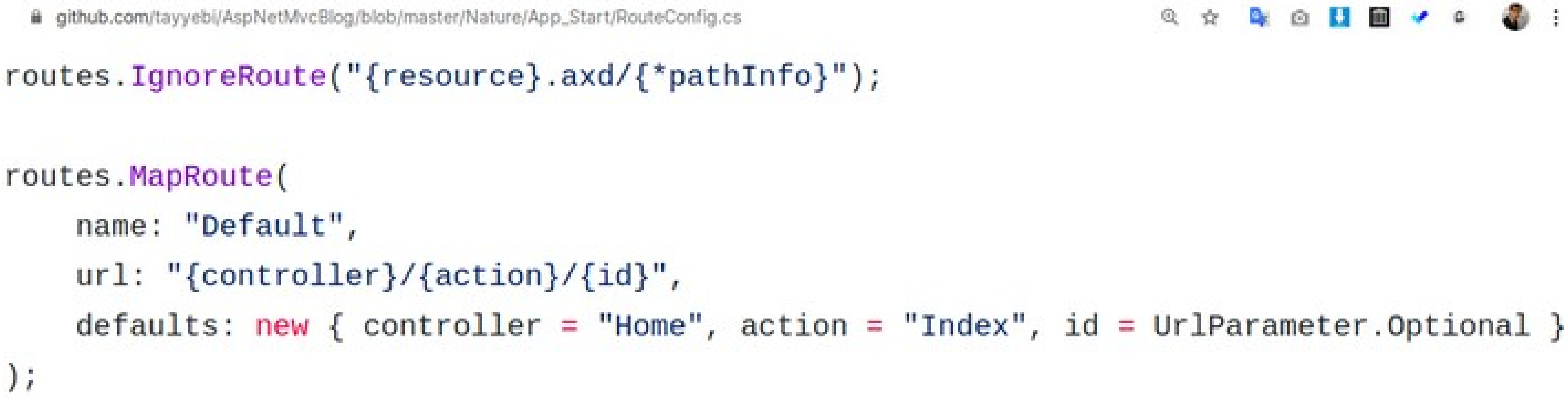
```
▾ Request Headers
  :authority: developer.mozilla.org
  :method: GET
  :path: /en-US/docs/Web/HTTP/Methods
  :scheme: https
  accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,imag
  accept-encoding: gzip, deflate, br
  accept-language: en-US,en;q=0.9,fa;q=0.8
  cache-control: max-age=0
  cookie: _ga=GA1.2.961233685.1583674091; dwf_sg_task_completion=False; _gid=GA
  referer: https://www.google.com/
  sec-fetch-dest: document
  sec-fetch-mode: navigate
  sec-fetch-site: cross-site
  sec-fetch-user: ?1
  upgrade-insecure-requests: 1
  user-agent: Mozilla/5.0 (Linux; Android 6.0; Nexus 5 Build/MRA58N) AppleWebKi
  afari/537.36
```

Finding Nemo (Web Routing)

Routing or router in web development is a mechanism where HTTP requests are routed to the code that handles them. To put simply, in the Router you determine what should happen when a user visits a certain page.

(https://divpusher.com/glossary/routing/)

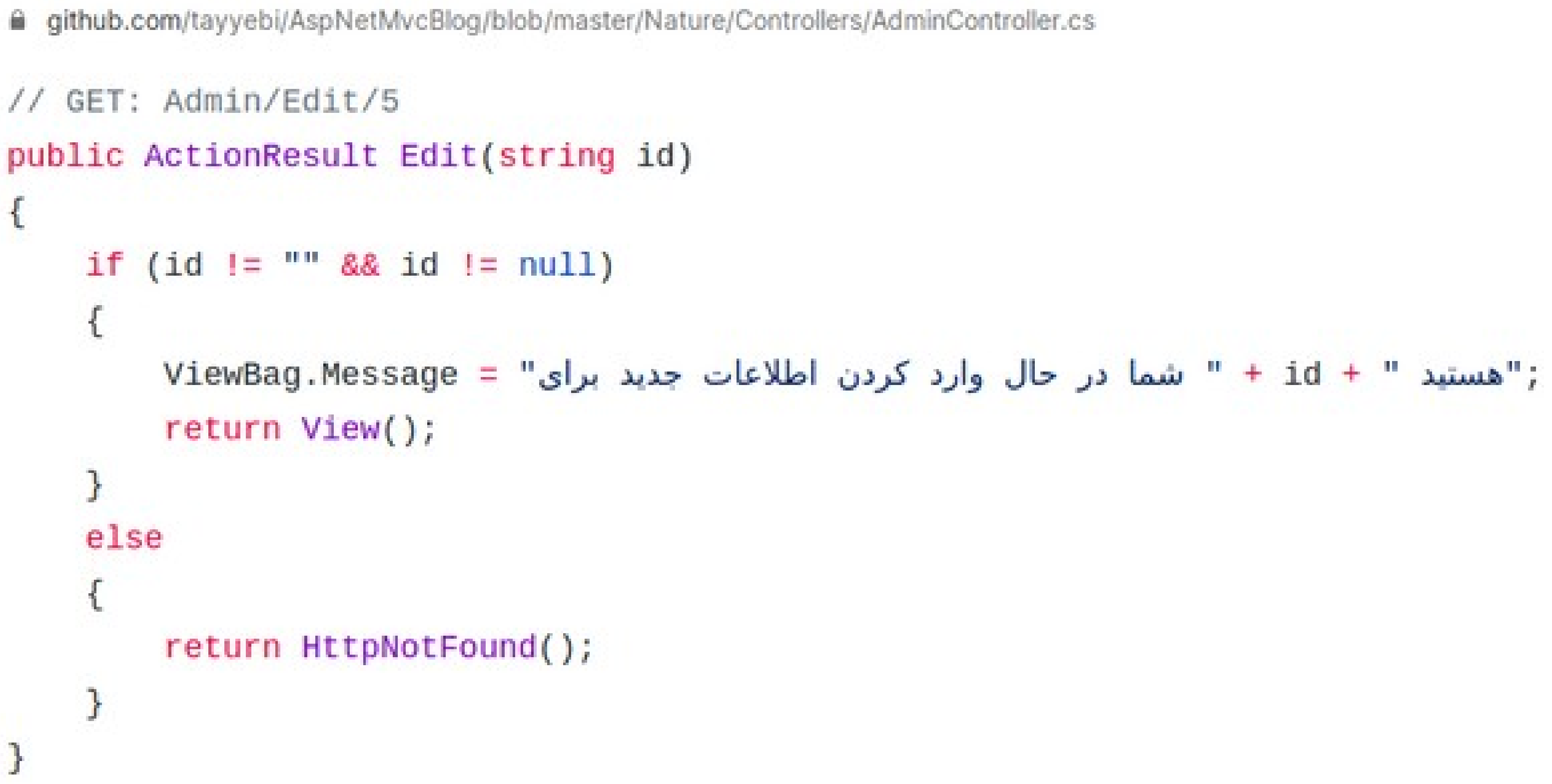
Finding Nemo (Web Routing, ASP.NET)



github.com/tayyebi/AspNetMvcBlog/blob/master/Nature/App_Start/RouteConfig.cs

```
routes.IgnoreRoute("{resource}.axd/{*pathInfo}");

routes.MapRoute(
    name: "Default",
    url: "{controller}/{action}/{id}",
    defaults: new { controller = "Home", action = "Index", id = UrlParameter.Optional }
);
```

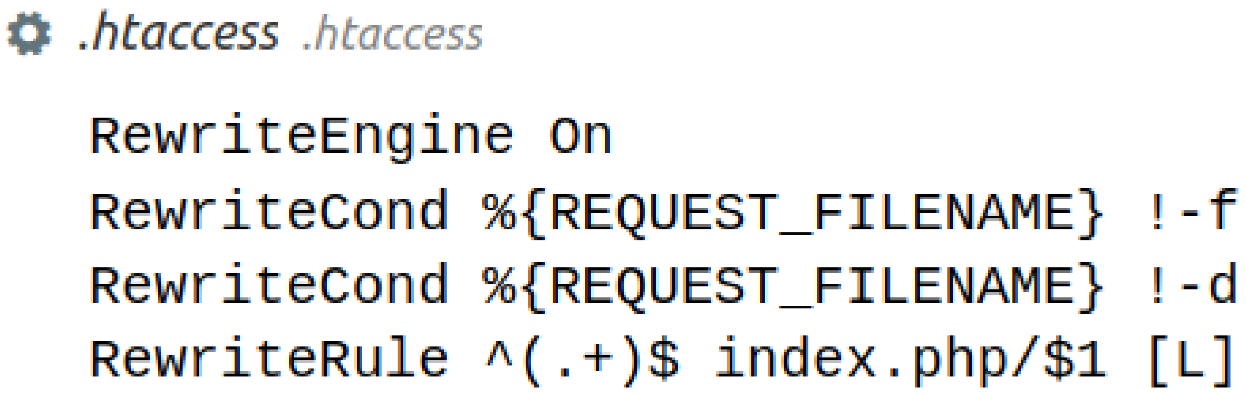
Finding Nemo (Web Routing, ASP.NET)



github.com/tayyebi/AspNetMvcBlog/blob/master/Nature/Controllers/AdminController.cs

```
// GET: Admin/Edit/5
public ActionResult Edit(string id)
{
    if (id != "" && id != null)
    {
        ViewBag.Message = "شما در حال وارد کردن اطلاعات جدید برای " + id + " هستید";
        return View();
    }
    else
    {
        return HttpNotFound();
    }
}
```

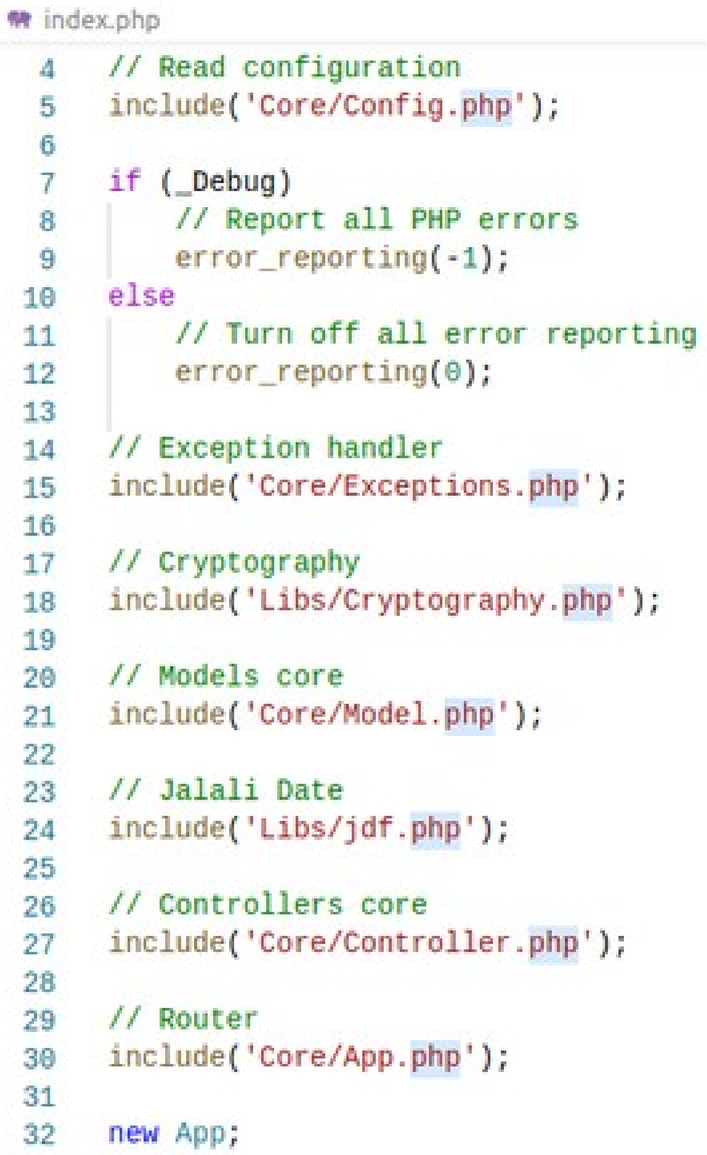
Finding Nemo (Web Routing, .htaccess)



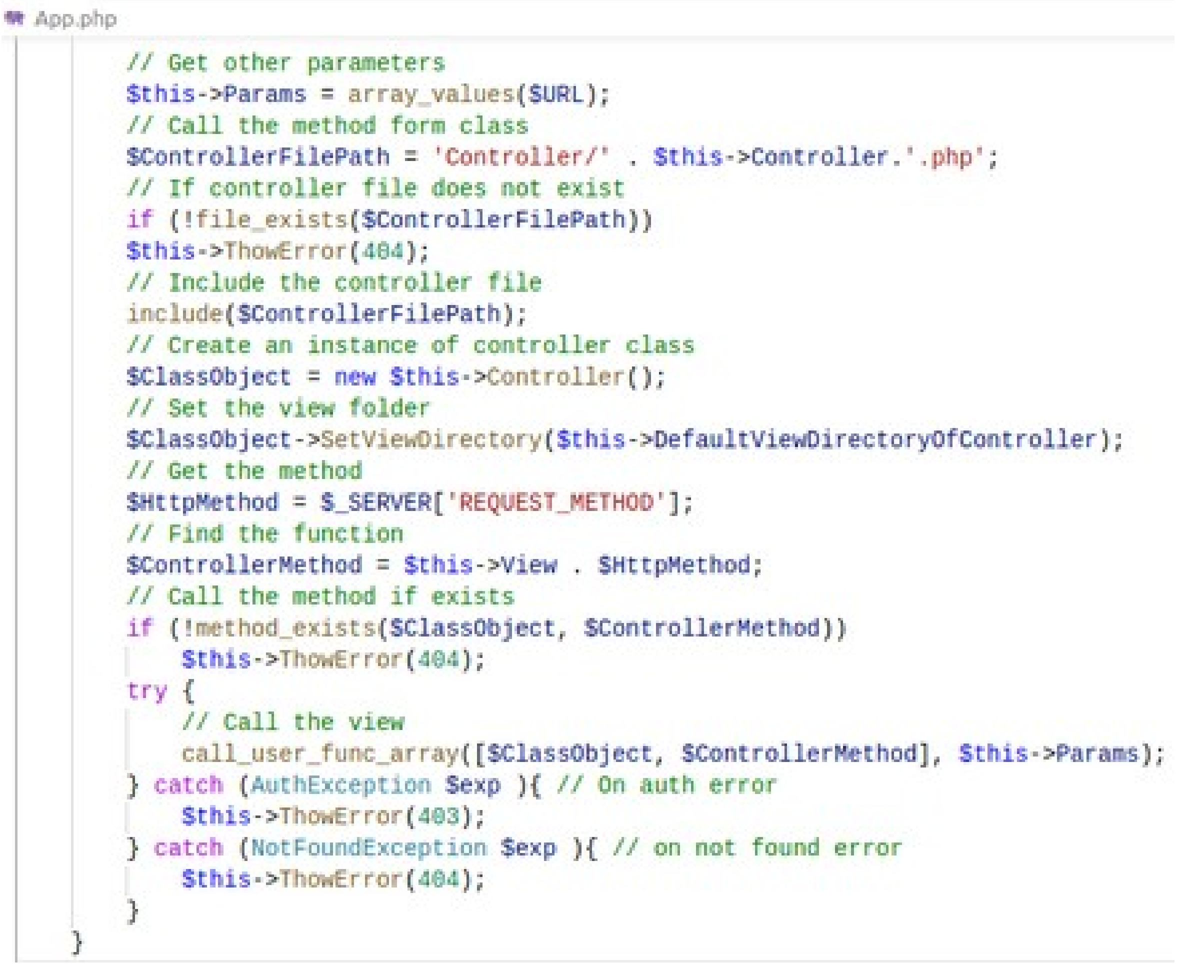
.htaccess .htaccess

```
RewriteEngine On
RewriteCond %{REQUEST_FILENAME} !-f
RewriteCond %{REQUEST_FILENAME} !-d
RewriteRule ^(.+)$ index.php/$1 [L]
```

Index.php, App.php

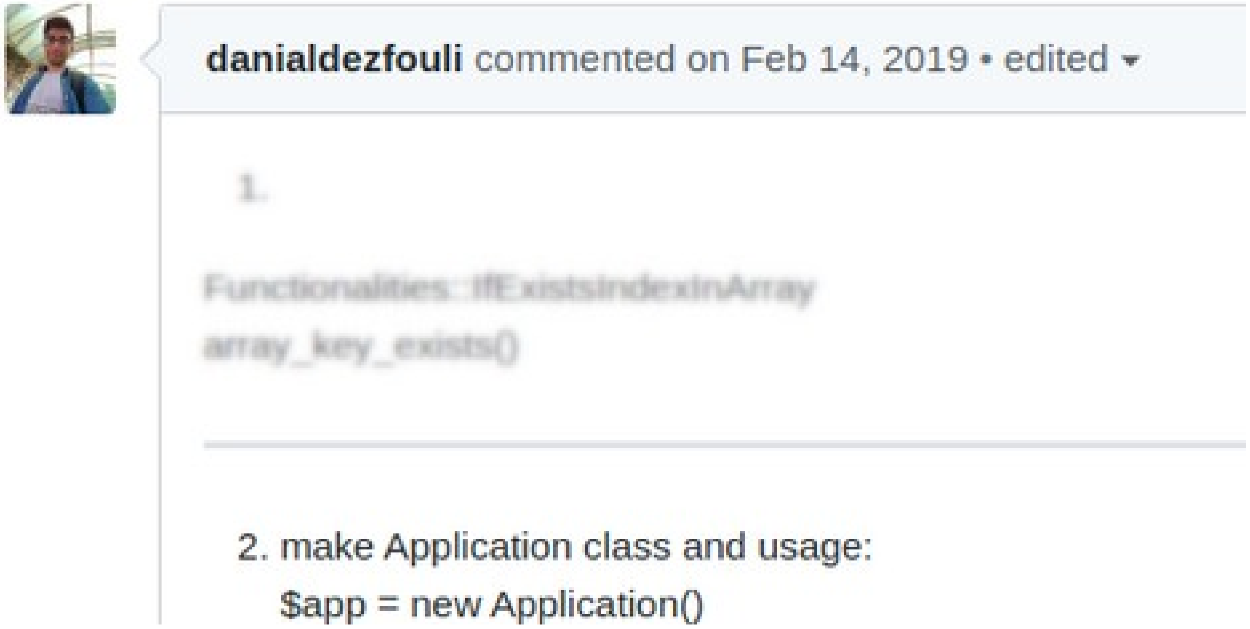


```php
// Read configuration
include('Core/Config.php');

if (_Debug)
    // Report all PHP errors
    error_reporting(-1);
else
    // Turn off all error reporting
    error_reporting(0);

// Exception handler
include('Core/Exceptions.php');

// Cryptography
include('Libs/Cryptography.php');

// Models core
include('Core/Model.php');

// Jalali Date
include('Libs/jdf.php');

// Controllers core
include('Core/Controller.php');

// Router
include('Core/App.php');

new App;
```



```php
        // Get other parameters
        $this->Params = array_values($URL);
        // Call the method form class
        $ControllerFilePath = 'Controller/' . $this->Controller.'.php';
        // If controller file does not exist
        if (!file_exists($ControllerFilePath))
        $this->ThowError(404);
        // Include the controller file
        include($ControllerFilePath);
        // Create an instance of controller class
        $ClassObject = new $this->Controller();
        // Set the view folder
        $ClassObject->SetViewDirectory($this->DefaultViewDirectoryOfController);
        // Get the method
        $HttpMethod = $_SERVER['REQUEST_METHOD'];
        // Find the function
        $ControllerMethod = $this->View . $HttpMethod;
        // Call the method if exists
        if (!method_exists($ClassObject, $ControllerMethod))
            $this->ThowError(404);
        try {
            // Call the view
            call_user_func_array([$ClassObject, $ControllerMethod], $this->Params);
        } catch (AuthException $exp ){ // On auth error
            $this->ThowError(403);
        } catch (NotFoundException $exp ){ // on not found error
            $this->ThowError(404);
        }
    }
```

Application Class



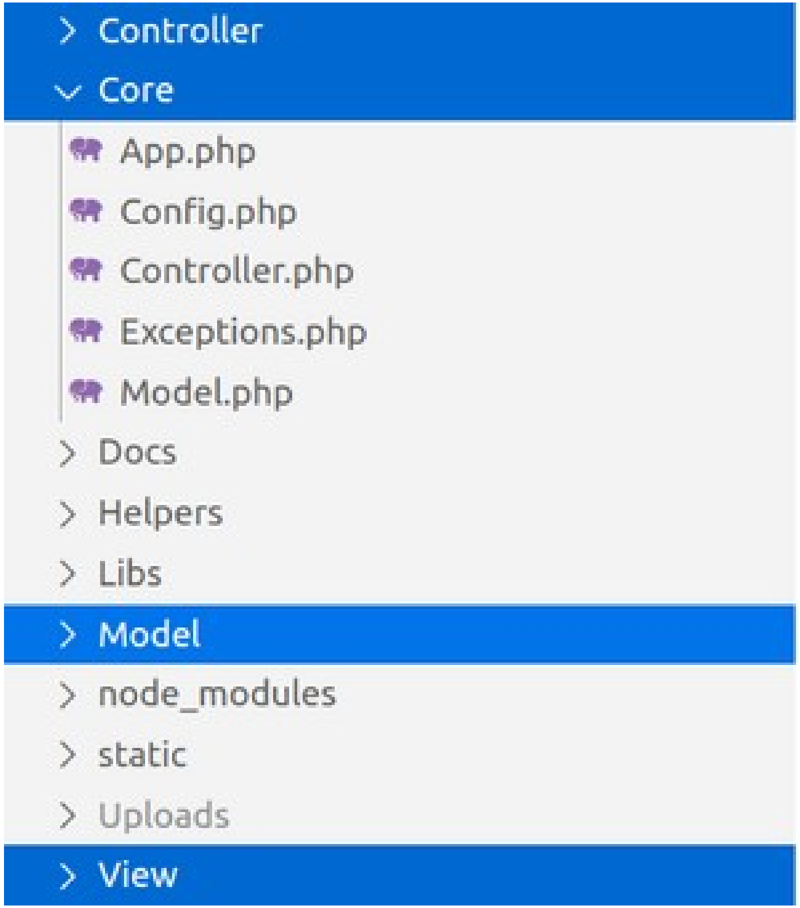
danialdezfouli commented on Feb 14, 2019 • edited ▾

1\.

Functionalities::IfExistsIndexInArray
array_key_exists()

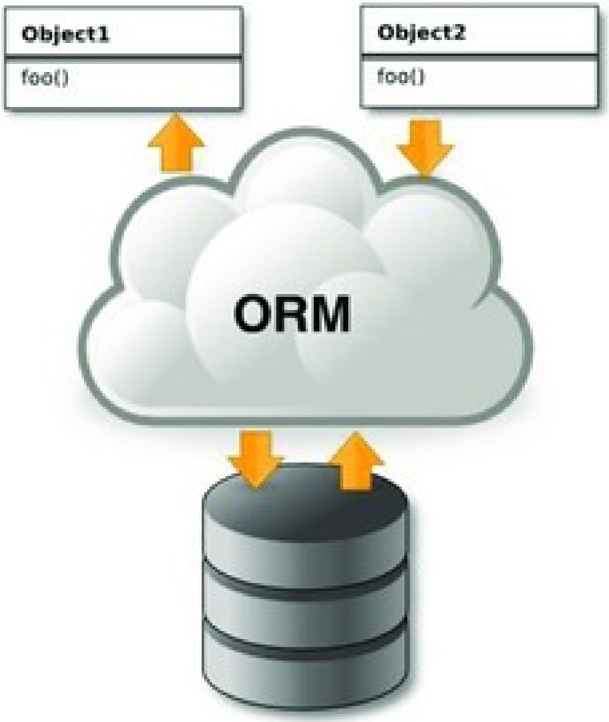
2. make Application class and usage:
$app = new Application()

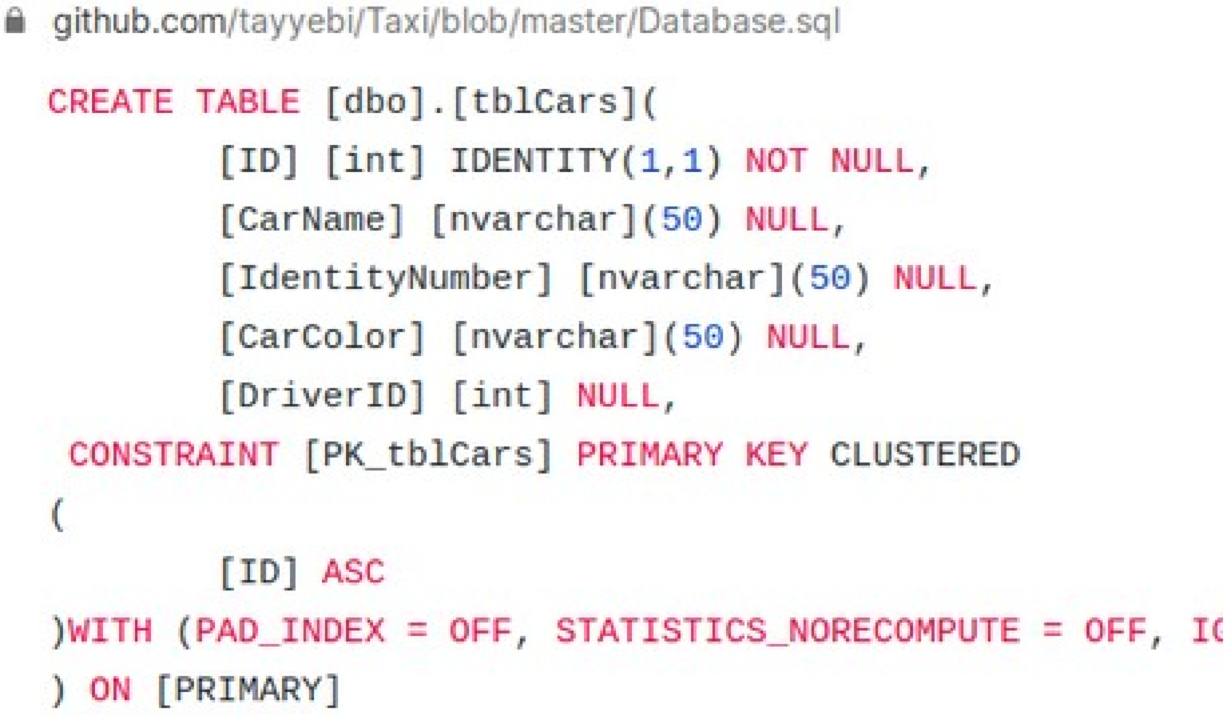
File Structure



```
> Controller
v Core
    App.php
    Config.php
    Controller.php
    Exceptions.php
    Model.php
> Docs
> Helpers
> Libs
> Model
> node_modules
> static
> Uploads
> View
```

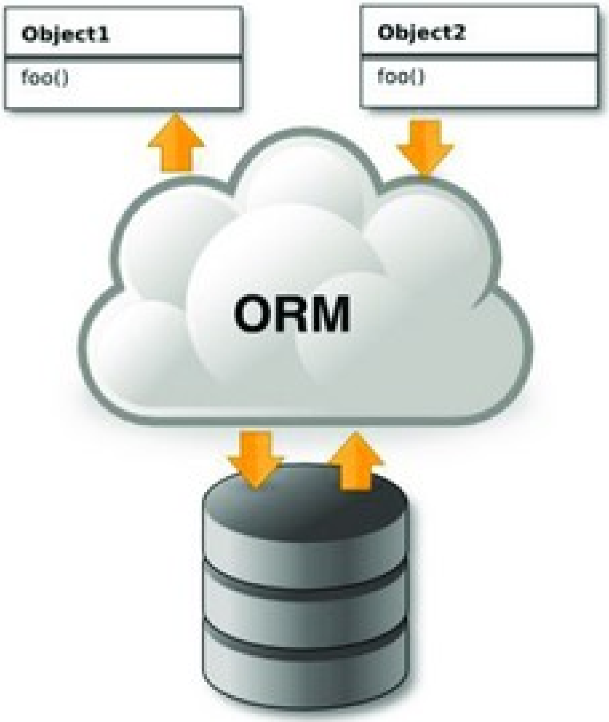
Data Models and Database

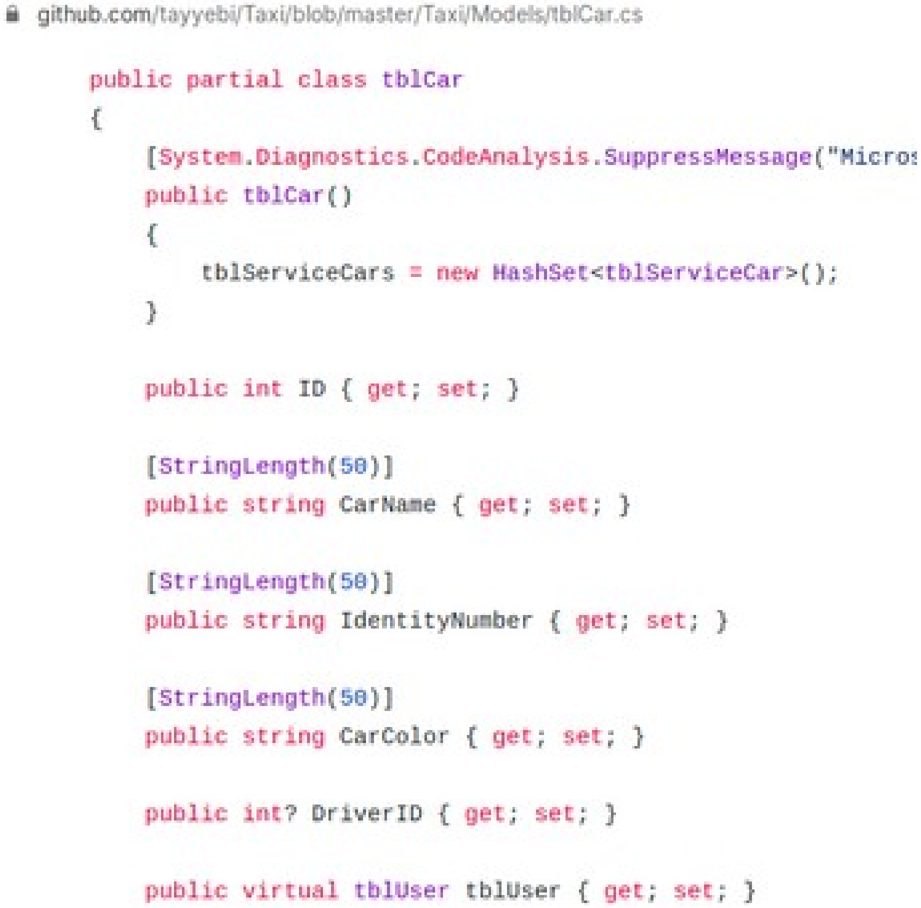



github.com/tayyebi/Taxi/blob/master/Database.sql

```
CREATE TABLE [dbo].[tblCars](
        [ID] [int] IDENTITY(1,1) NOT NULL,
        [CarName] [nvarchar](50) NULL,
        [IdentityNumber] [nvarchar](50) NULL,
        [CarColor] [nvarchar](50) NULL,
        [DriverID] [int] NULL,
 CONSTRAINT [PK_tblCars] PRIMARY KEY CLUSTERED
(
        [ID] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IG
) ON [PRIMARY]
```

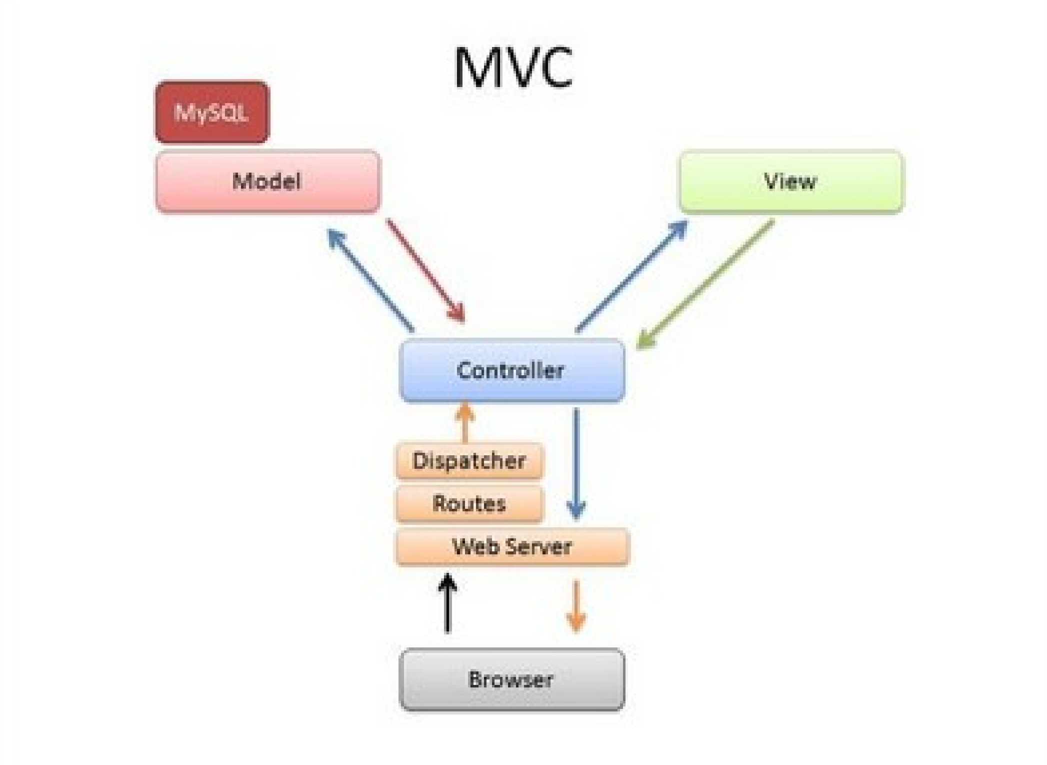
Data Models and Database




github.com/tayyebi/Taxi/blob/master/Taxi/Models/tblCar.cs

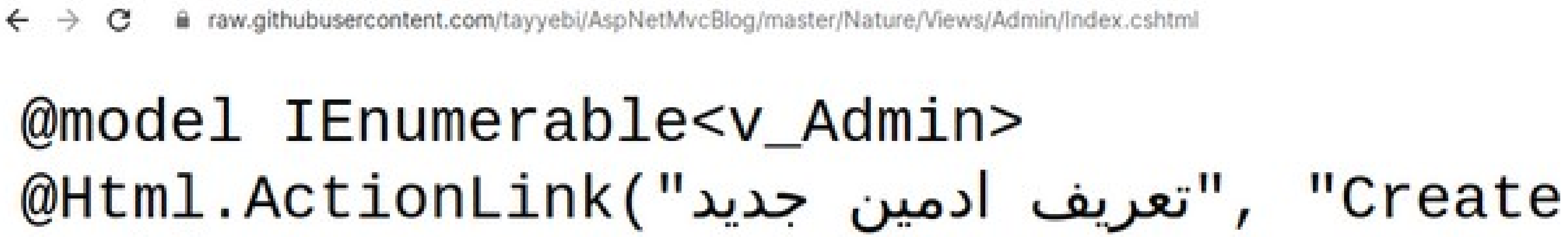
```
public partial class tblCar
{
    [System.Diagnostics.CodeAnalysis.SuppressMessage("Micros
    public tblCar()
    {
        tblServiceCars = new HashSet<tblServiceCar>();
    }

    public int ID { get; set; }

    [StringLength(50)]
    public string CarName { get; set; }

    [StringLength(50)]
    public string IdentityNumber { get; set; }

    [StringLength(50)]
    public string CarColor { get; set; }

    public int? DriverID { get; set; }

    public virtual tblUser tblUser { get; set; }
```

Model-View-Controller

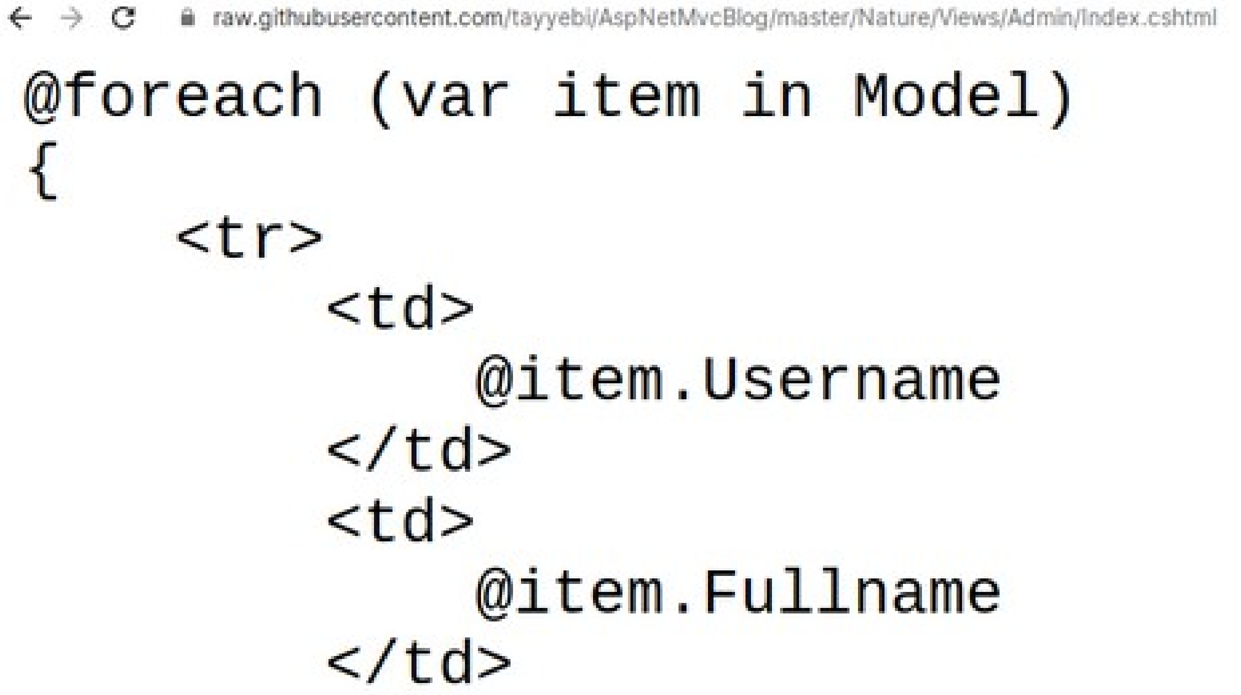


(https://www.slideshare.net/victorporof/beginners-guide-to-ruby-on-rails/6)

Model-View Communications, But How?


raw.githubusercontent.com/tayyebi/AspNetMvcBlog/master/Nature/Views/Admin/Index.cshtml

```
@model IEnumerable<v_Admin>
@Html.ActionLink("تعریف ادمین جدید", "Create
```


raw.githubusercontent.com/tayyebi/AspNetMvcBlog/master/Nature/Views/Admin/Index.cshtml

```
@foreach (var item in Model)
{
    <tr>
        <td>
            @item.Username
        </td>
        <td>
            @item.Fullname
        </td>
```

Exercise

1. Rent/Install a VPS

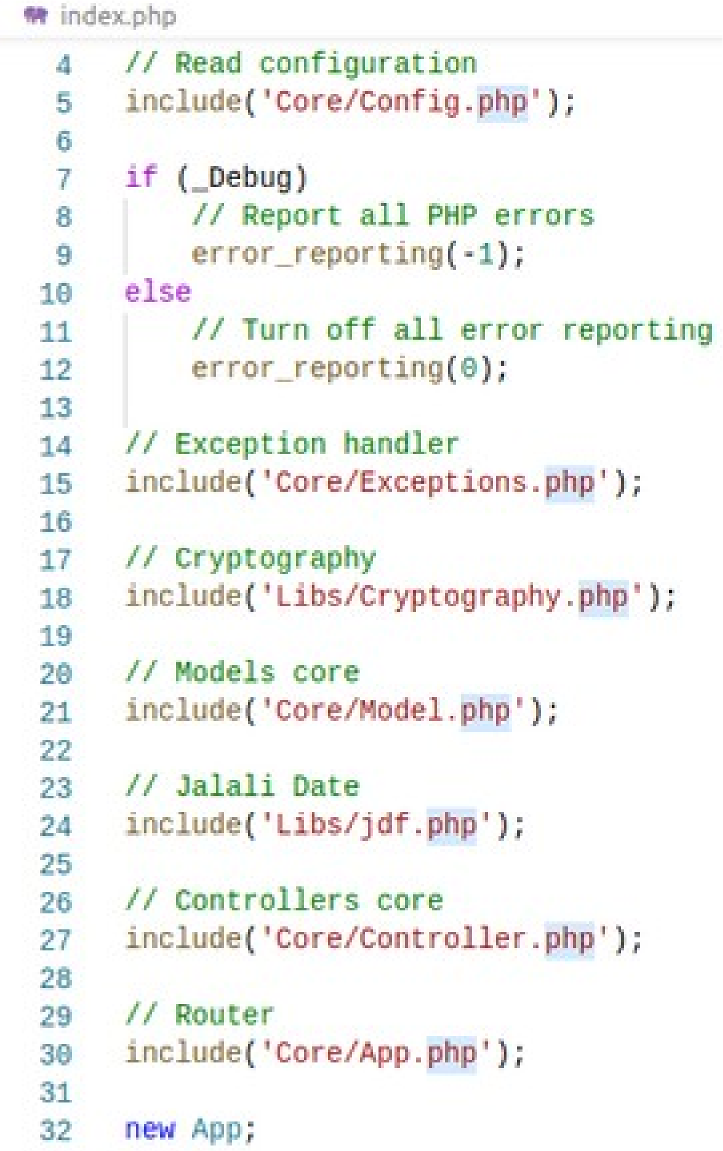
2. Host different websites with different domains on the same server.

3. (In case of virtualization) You can use /etc/hosts/ for a sense of different host names.

Session 2

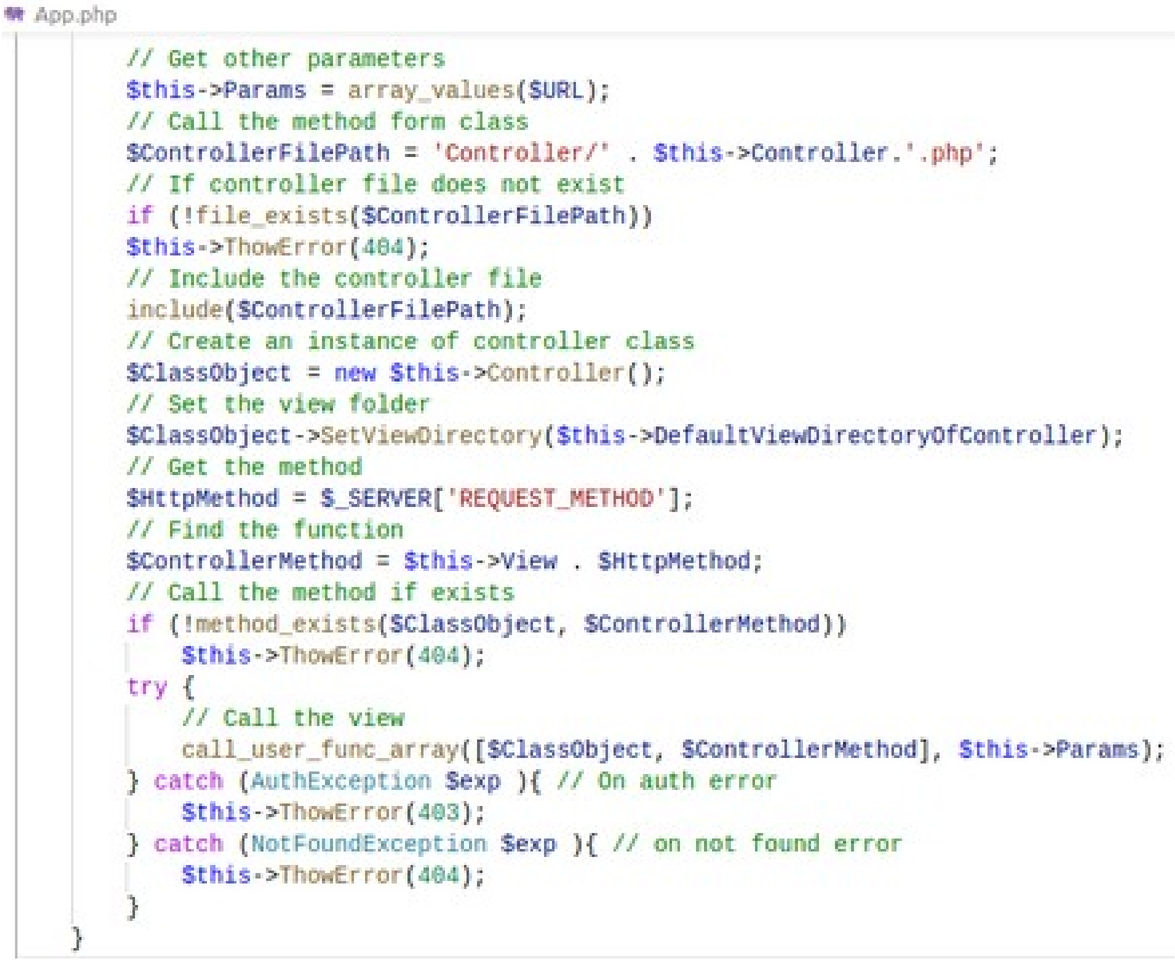
(Application Class & Rewrite Rules)

Index.php, App.php



index.php

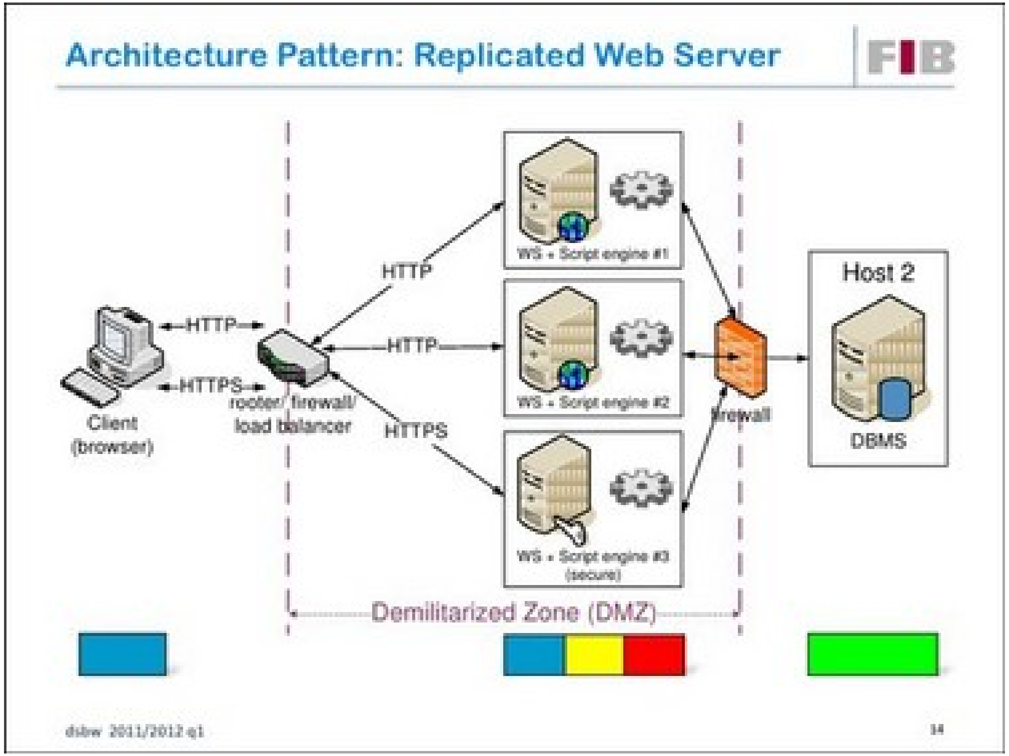
```php
// Read configuration
include('Core/Config.php');

if (_Debug)
    // Report all PHP errors
    error_reporting(-1);
else
    // Turn off all error reporting
    error_reporting(0);

// Exception handler
include('Core/Exceptions.php');

// Cryptography
include('Libs/Cryptography.php');

// Models core
include('Core/Model.php');

// Jalali Date
include('Libs/jdf.php');

// Controllers core
include('Core/Controller.php');

// Router
include('Core/App.php');

new App;
```



App.php

```php
        // Get other parameters
        $this->Params = array_values($URL);
        // Call the method form class
        $ControllerFilePath = 'Controller/' . $this->Controller.'.php';
        // If controller file does not exist
        if (!file_exists($ControllerFilePath))
        $this->ThowError(404);
        // Include the controller file
        include($ControllerFilePath);
        // Create an instance of controller class
        $ClassObject = new $this->Controller();
        // Set the view folder
        $ClassObject->SetViewDirectory($this->DefaultViewDirectoryOfController);
        // Get the method
        $HttpMethod = $_SERVER['REQUEST_METHOD'];
        // Find the function
        $ControllerMethod = $this->View . $HttpMethod;
        // Call the method if exists
        if (!method_exists($ClassObject, $ControllerMethod))
            $this->ThowError(404);
        try {
            // Call the view
            call_user_func_array([$ClassObject, $ControllerMethod], $this->Params);
        } catch (AuthException $exp ){ // On auth error
            $this->ThowError(403);
        } catch (NotFoundException $exp ){ // on not found error
            $this->ThowError(404);
        }
    }
```

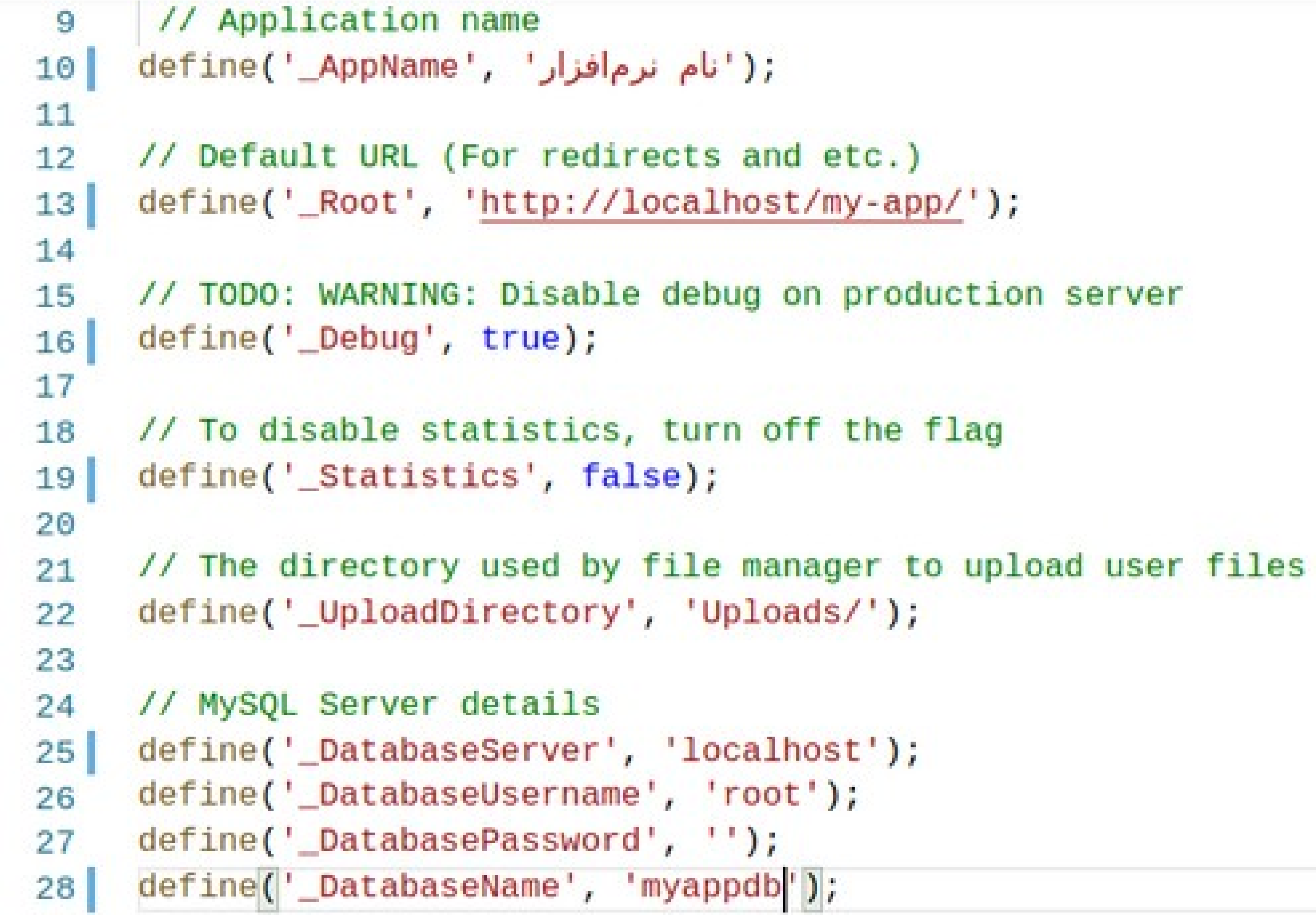
Multi-Tier Architecture



Architecture Pattern: Replicated Web Server

(https://www.indiamart.com/proddetail/server-architecture-design-11677941412.html)

Config.php



```
// Application name
define('_AppName', 'نام نرم‌افزار');

// Default URL (For redirects and etc.)
define('_Root', 'http://localhost/my-app/');

// TODO: WARNING: Disable debug on production server
define('_Debug', true);

// To disable statistics, turn off the flag
define('_Statistics', false);

// The directory used by file manager to upload user files
define('_UploadDirectory', 'Uploads/');

// MySQL Server details
define('_DatabaseServer', 'localhost');
define('_DatabaseUsername', 'root');
define('_DatabasePassword', '');
define('_DatabaseName', 'myappdb');
```

$_SERVER["PATH_INFO"] vs QUERY STRING

A Query String is the part of a uniform resource locator (URL) which assigns values to specified parameters.

http://.../?key1=val1&key2=val2

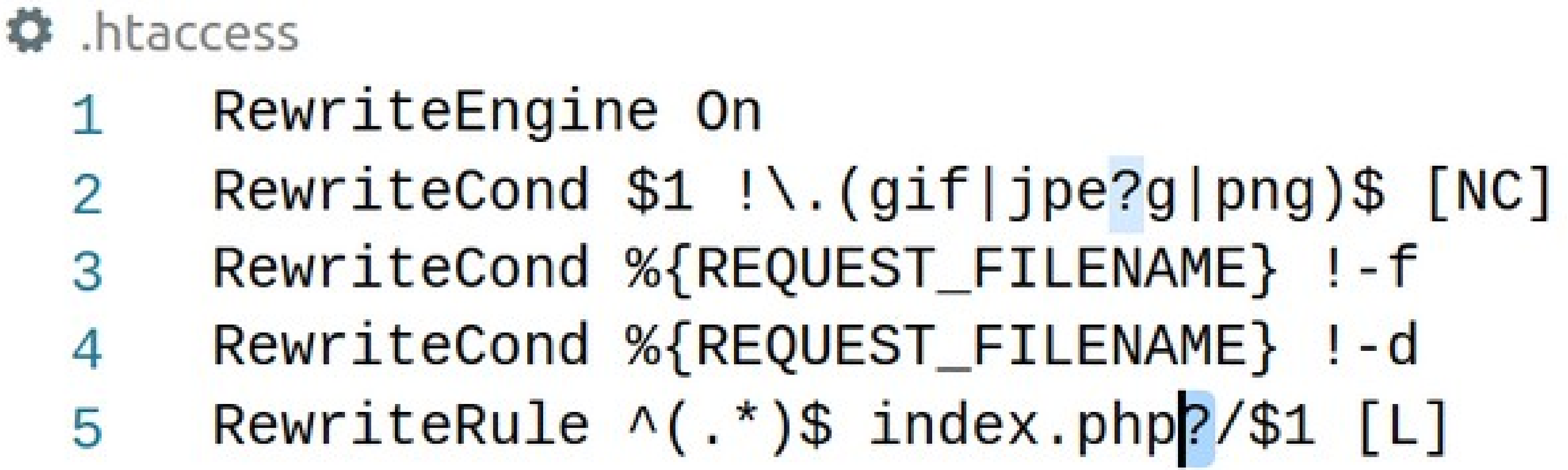
(https://en.wikipedia.org/wiki/Query_string)

$_SERVER["PATH_INFO"] vs QUERY STRING

Another form

http://.../?/val1/val2

$_SERVER["PATH_INFO"] vs QUERY STRING



.htaccess

```
RewriteEngine On
RewriteCond $1 !\.(gif|jpe?g|png)$ [NC]
RewriteCond %{REQUEST_FILENAME} !-f
RewriteCond %{REQUEST_FILENAME} !-d
RewriteRule ^(.*)$ index.php?/$1 [L]
```

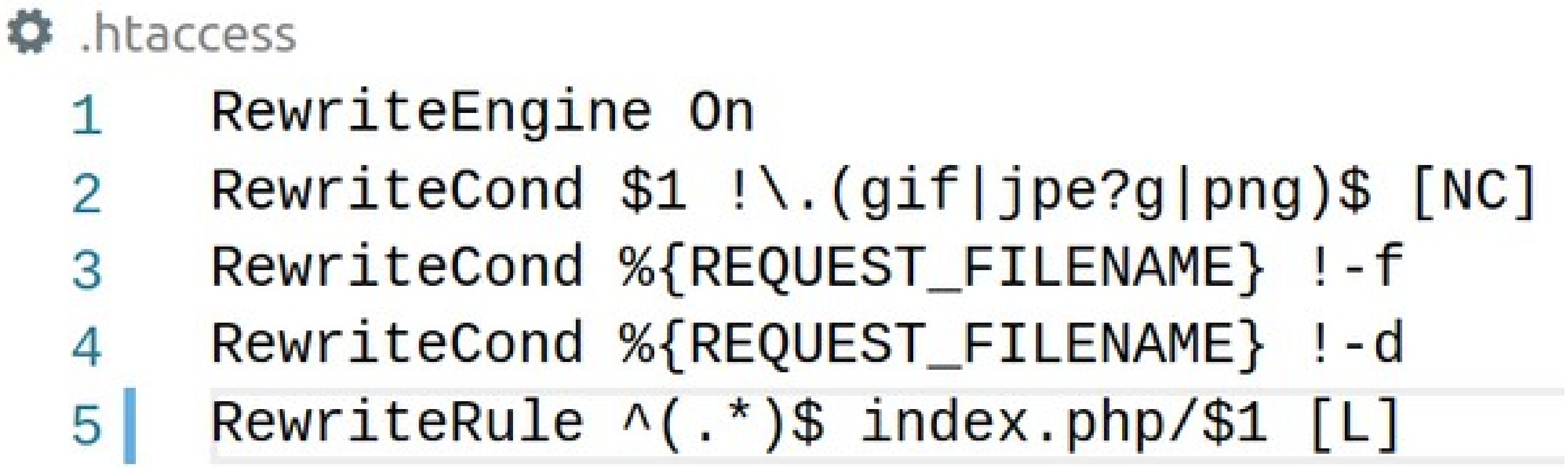
$_SERVER["PATH_INFO"] vs QUERY STRING

The PATH_INFO variable is only present if you invoke a PHP script like this:

http://.../val1/val2

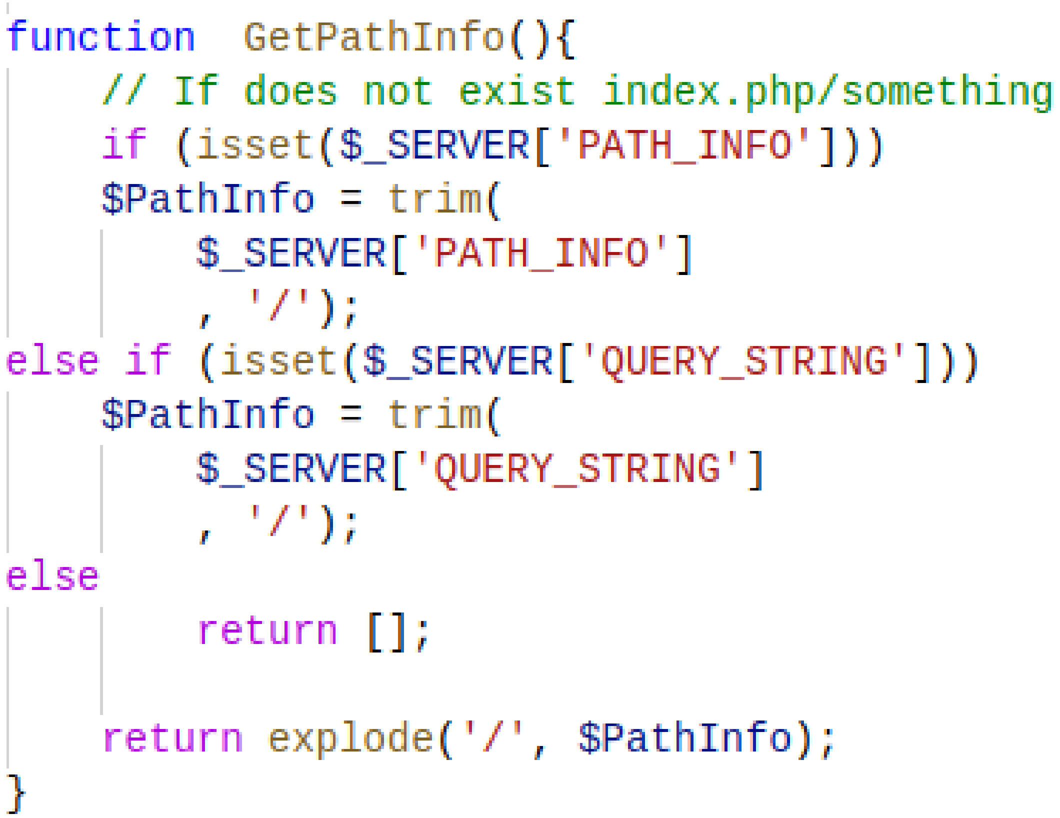
(https://stackoverflow.com/questions/5629683)

$_SERVER["PATH_INFO"] vs QUERY STRING



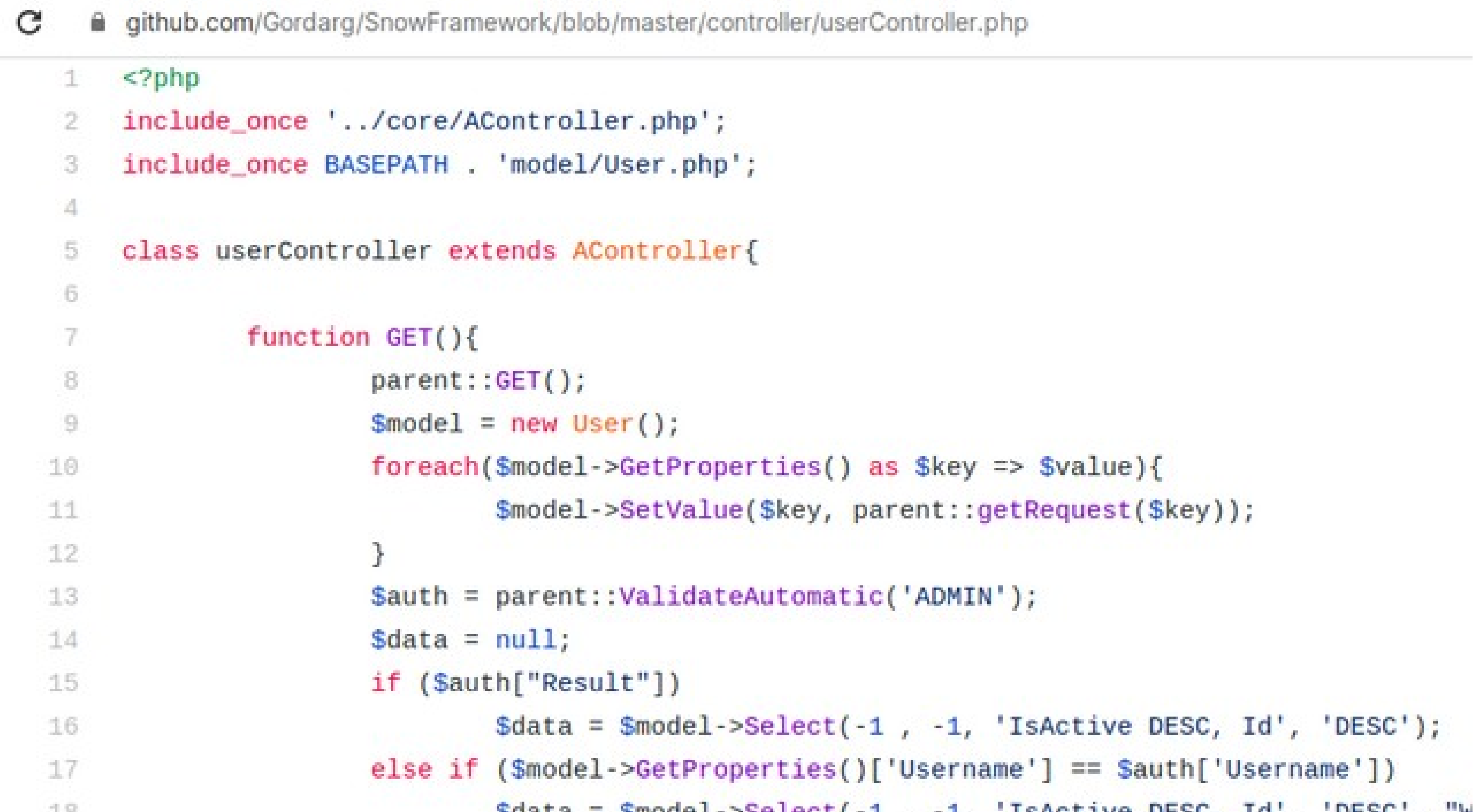
```
RewriteEngine On
RewriteCond $1 !\.(gif|jpe?g|png)$ [NC]
RewriteCond %{REQUEST_FILENAME} !-f
RewriteCond %{REQUEST_FILENAME} !-d
RewriteRule ^(.*)$ index.php/$1 [L]
```

$_SERVER["PATH_INFO"] vs QUERY STRING



```php
function  GetPathInfo(){
    // If does not exist index.php/something
    if (isset($_SERVER['PATH_INFO']))
    $PathInfo = trim(
        $_SERVER['PATH_INFO']
        , '/');
else if (isset($_SERVER['QUERY_STRING']))
    $PathInfo = trim(
        $_SERVER['QUERY_STRING']
        , '/');
else
        return [];

    return explode('/', $PathInfo);
}
```

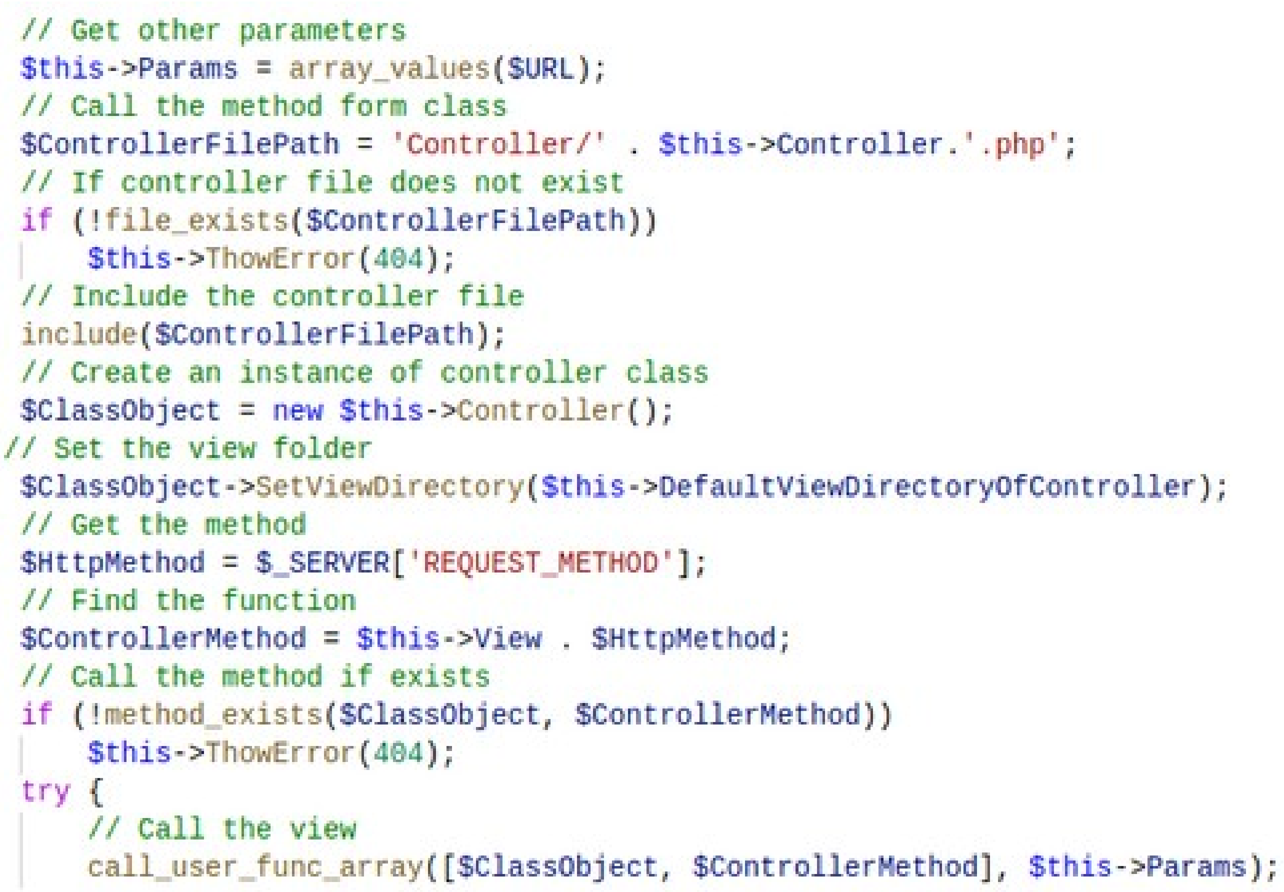
Evaluate with include – DP 1



github.com/Gordarg/SnowFramework/blob/master/controller/userController.php

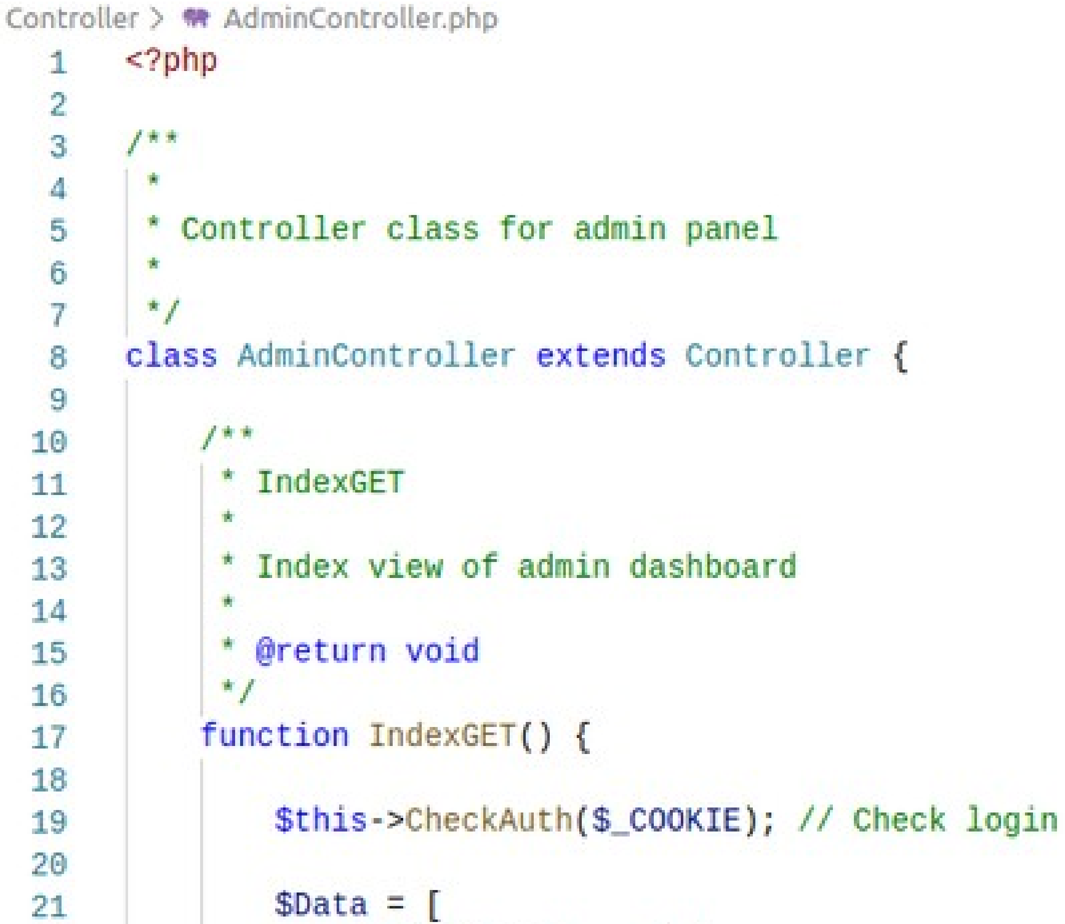
```php
<?php
include_once '../core/AController.php';
include_once BASEPATH . 'model/User.php';

class userController extends AController{

        function GET(){
                parent::GET();
                $model = new User();
                foreach($model->GetProperties() as $key => $value){
                        $model->SetValue($key, parent::getRequest($key));
                }
                $auth = parent::ValidateAutomatic('ADMIN');
                $data = null;
                if ($auth["Result"])
                        $data = $model->Select(-1 , -1, 'IsActive DESC, Id', 'DESC');
                else if ($model->GetProperties()['Username'] == $auth['Username'])
                        $data = $model->Select(-1 , -1, 'IsActive DESC, Id', 'DESC', "W
```

Evaluate with include – DP 2



```
 // Get other parameters
 $this->Params = array_values($URL);
 // Call the method form class
 $ControllerFilePath = 'Controller/' . $this->Controller.'.php';
 // If controller file does not exist
 if (!file_exists($ControllerFilePath))
     $this->ThowError(404);
 // Include the controller file
 include($ControllerFilePath);
 // Create an instance of controller class
 $ClassObject = new $this->Controller();
// Set the view folder
 $ClassObject->SetViewDirectory($this->DefaultViewDirectoryOfController);
 // Get the method
 $HttpMethod = $_SERVER['REQUEST_METHOD'];
 // Find the function
 $ControllerMethod = $this->View . $HttpMethod;
 // Call the method if exists
 if (!method_exists($ClassObject, $ControllerMethod))
     $this->ThowError(404);
 try {
     // Call the view
     call_user_func_array([$ClassObject, $ControllerMethod], $this->Params);
```

Inheritance for DP 2



Controller > AdminController.php

```php
<?php

/**
 *
 * Controller class for admin panel
 *
 */
class AdminController extends Controller {

    /**
     * IndexGET
     *
     * Index view of admin dashboard
     *
     * @return void
     */
    function IndexGET() {

        $this->CheckAuth($_COOKIE); // Check login

        $Data = [
```

Exercise

Please implement your own application class.

Session 3

(Model and Controller Structure)

PHP Data Objects (PDO)

The PHP Data Objects (PDO) extension defines a lightweight, consistent interface for accessing databases in PHP. Each database driver that implements the PDO interface can expose database-specific features as regular extension functions. Note that you cannot perform any database functions using the PDO extension by itself; you must use a database-specific PDO driver to access a database server.

PDO provides a data-access abstraction layer, which means that, regardless of which database you're using, you use the same functions to issue queries and fetch data. PDO does not provide a database abstraction; it doesn't rewrite SQL or emulate missing features. You should use a full-blown abstraction layer if you need that facility.

PDO ships with PHP 5.1, and is available as a PECL extension for PHP 5.0; PDO requires the new OO features in the core of PHP 5, and so will not run with earlier versions of PHP.

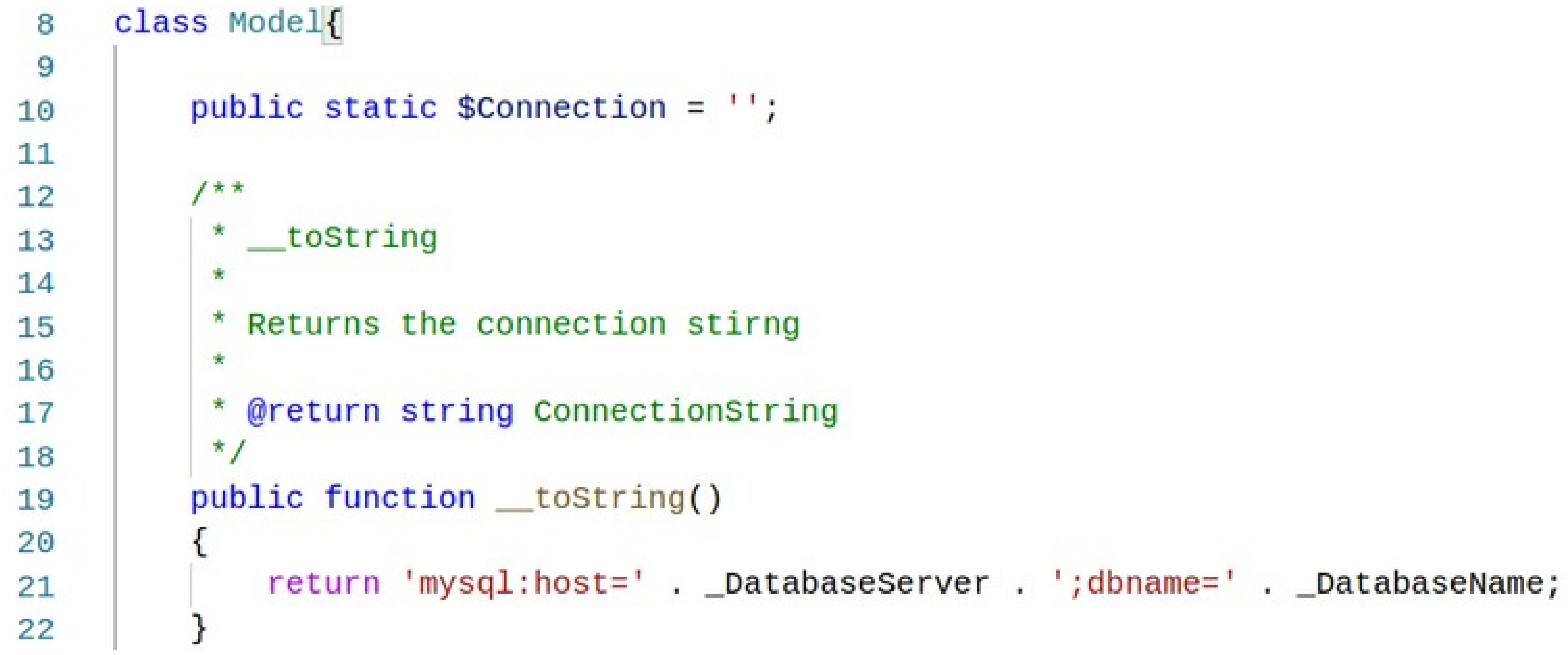
- php.net

PDO features

- extension=php_pdo.dll
- extension=php_pdo_firebird.dll
- extension=php_pdo_informix.dll
- extension=php_pdo_mssql.dll
- extension=php_pdo_mysql.dll
- extension=php_pdo_oci.dll
- extension=php_pdo_oci8.dll
- extension=php_pdo_odbc.dll
- extension=php_pdo_pgsql.dll
- extension=php_pdo_sqlite.dll

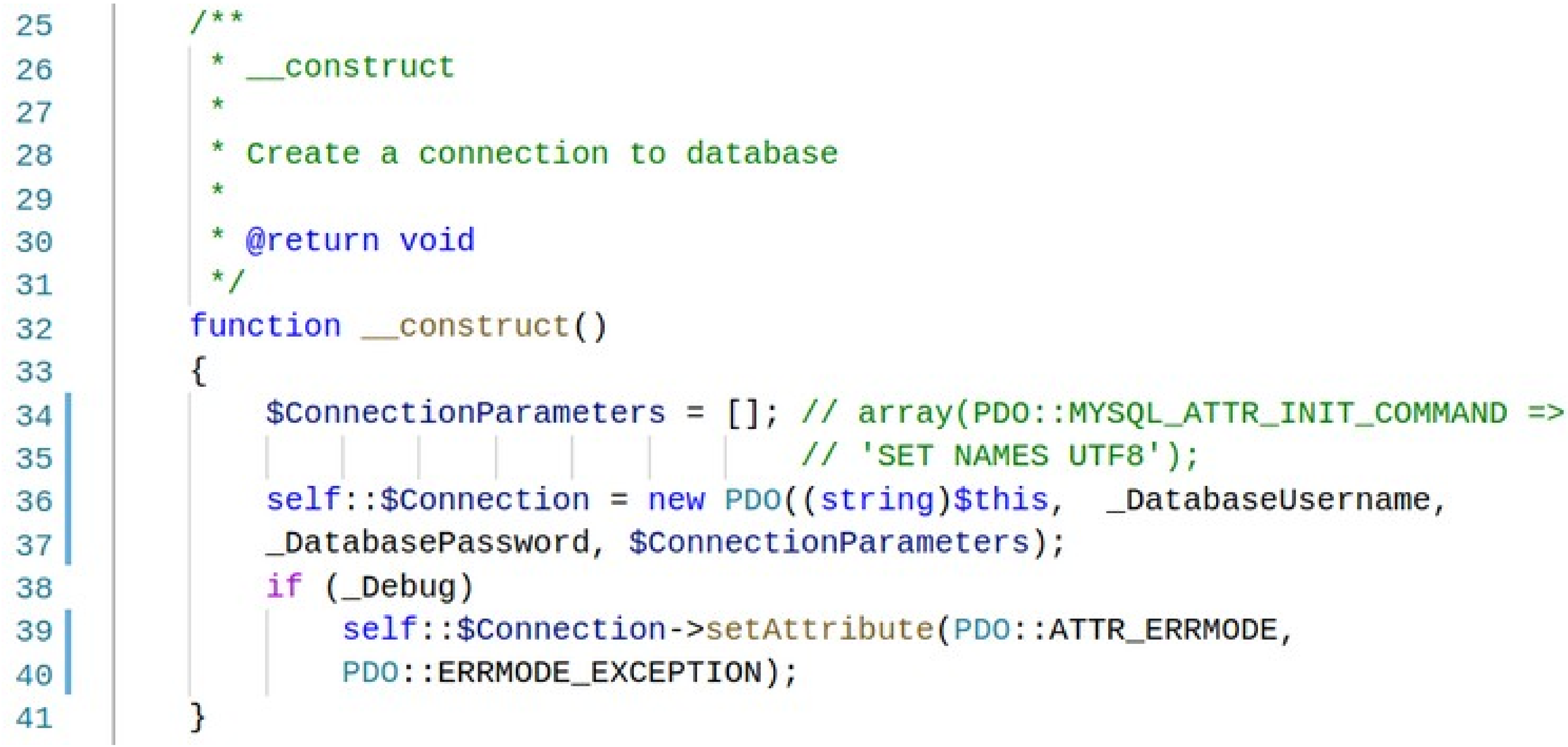
TODO:
How to build a simple “PDO” thing.

Core/Model.php



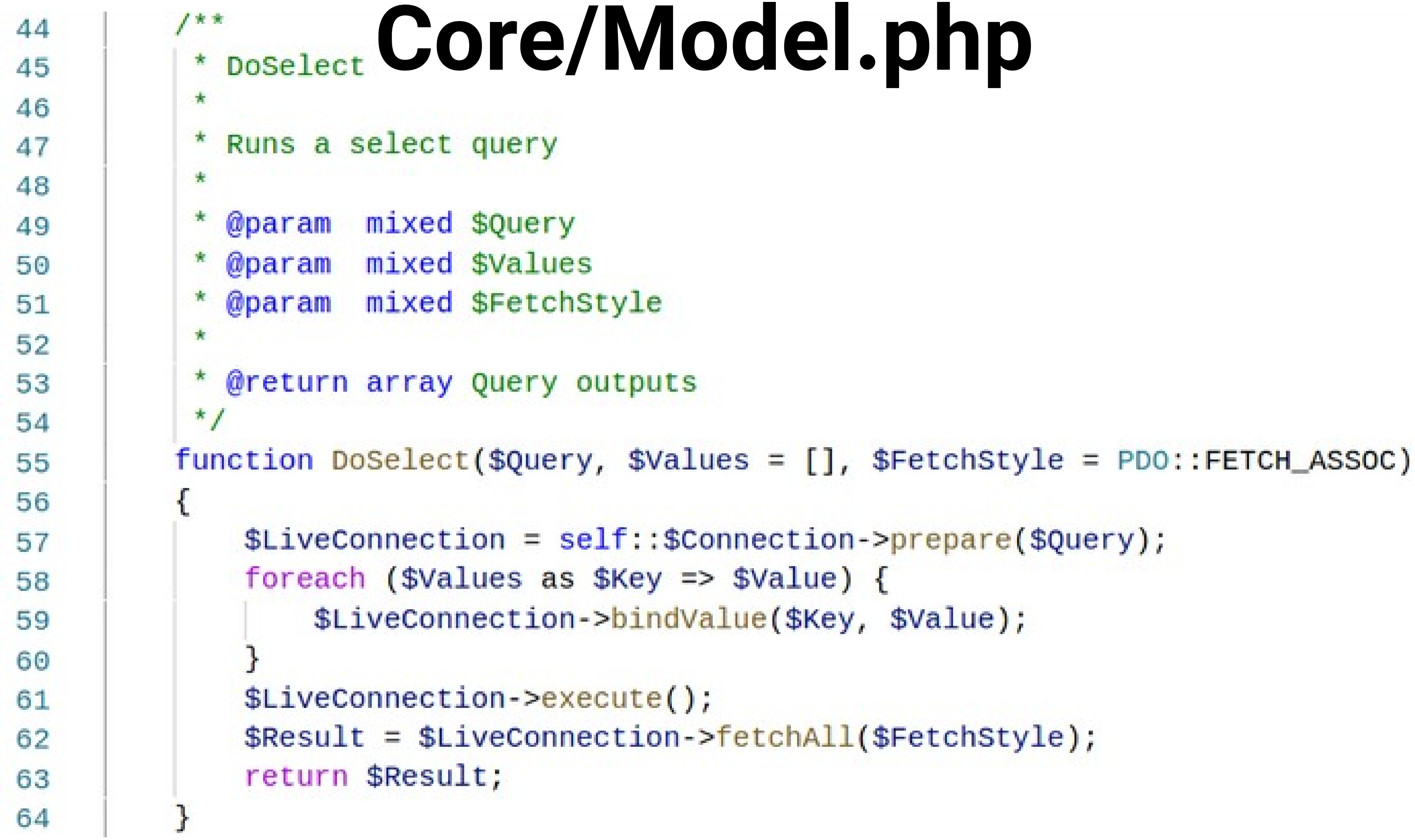
```php
class Model{

    public static $Connection = '';

    /**
     * __toString
     *
     * Returns the connection stirng
     *
     * @return string ConnectionString
     */
    public function __toString()
    {
        return 'mysql:host=' . _DatabaseServer . ';dbname=' . _DatabaseName;
    }
```

Core/Model.php



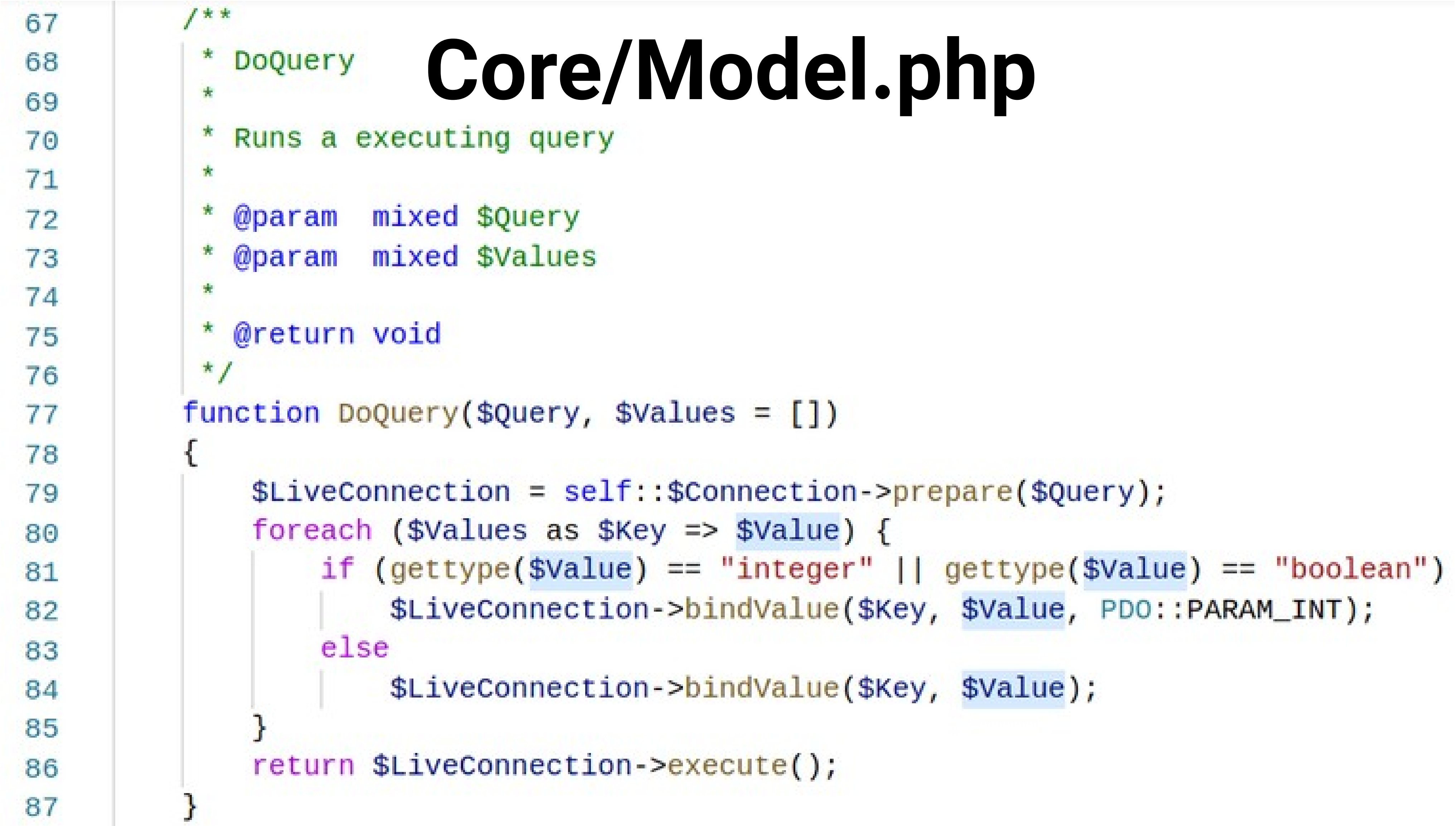
```php
/**
 * __construct
 *
 * Create a connection to database
 *
 * @return void
 */
function __construct()
{
    $ConnectionParameters = []; // array(PDO::MYSQL_ATTR_INIT_COMMAND =>
                                // 'SET NAMES UTF8');
    self::$Connection = new PDO((string)$this,  _DatabaseUsername,
    _DatabasePassword, $ConnectionParameters);
    if (_Debug)
        self::$Connection->setAttribute(PDO::ATTR_ERRMODE,
        PDO::ERRMODE_EXCEPTION);
}
```

Core/Model.php



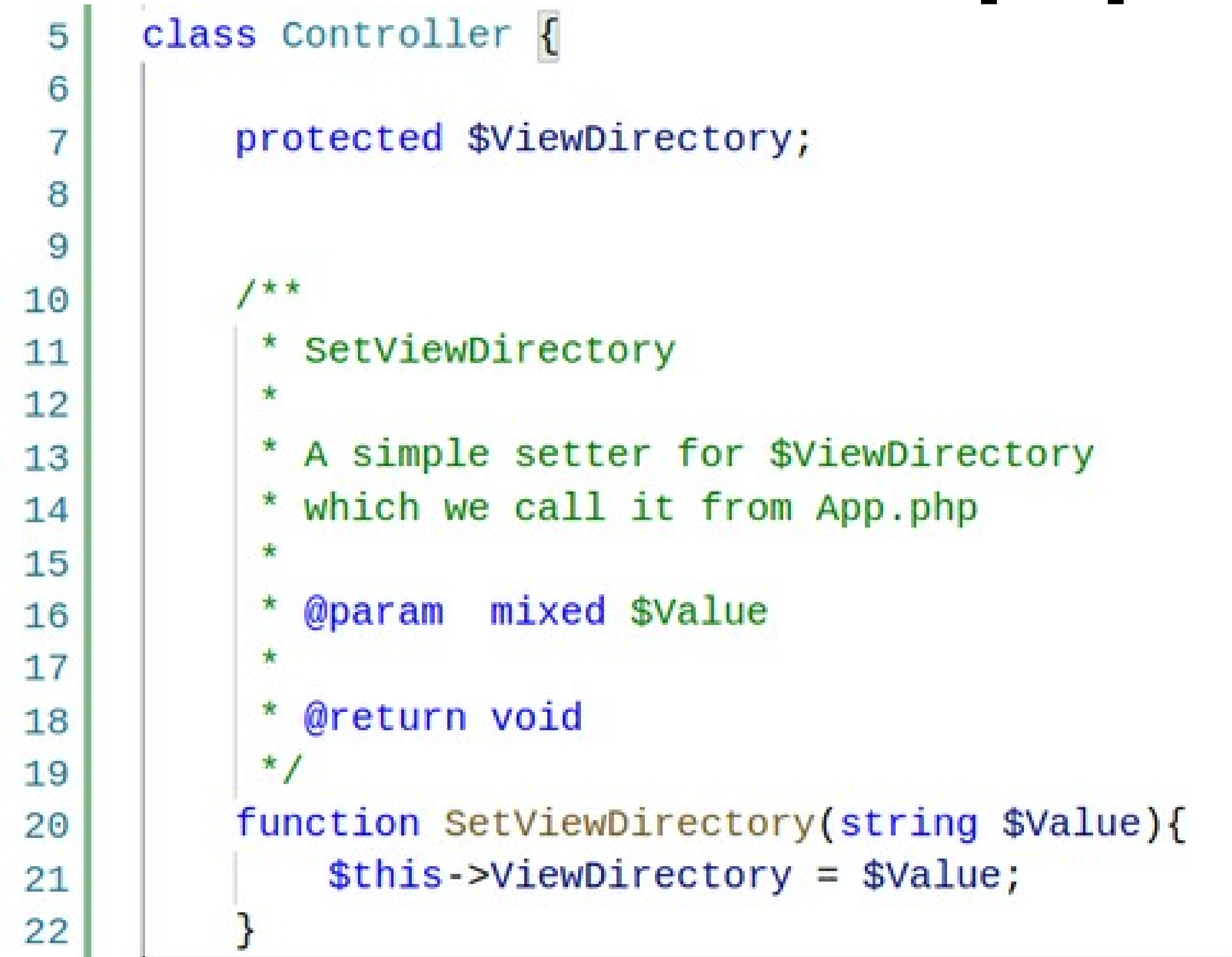
```php
/**
 * DoSelect
 *
 * Runs a select query
 *
 * @param  mixed $Query
 * @param  mixed $Values
 * @param  mixed $FetchStyle
 *
 * @return array Query outputs
 */
function DoSelect($Query, $Values = [], $FetchStyle = PDO::FETCH_ASSOC)
{
    $LiveConnection = self::$Connection->prepare($Query);
    foreach ($Values as $Key => $Value) {
        $LiveConnection->bindValue($Key, $Value);
    }
    $LiveConnection->execute();
    $Result = $LiveConnection->fetchAll($FetchStyle);
    return $Result;
}
```

Core/Model.php



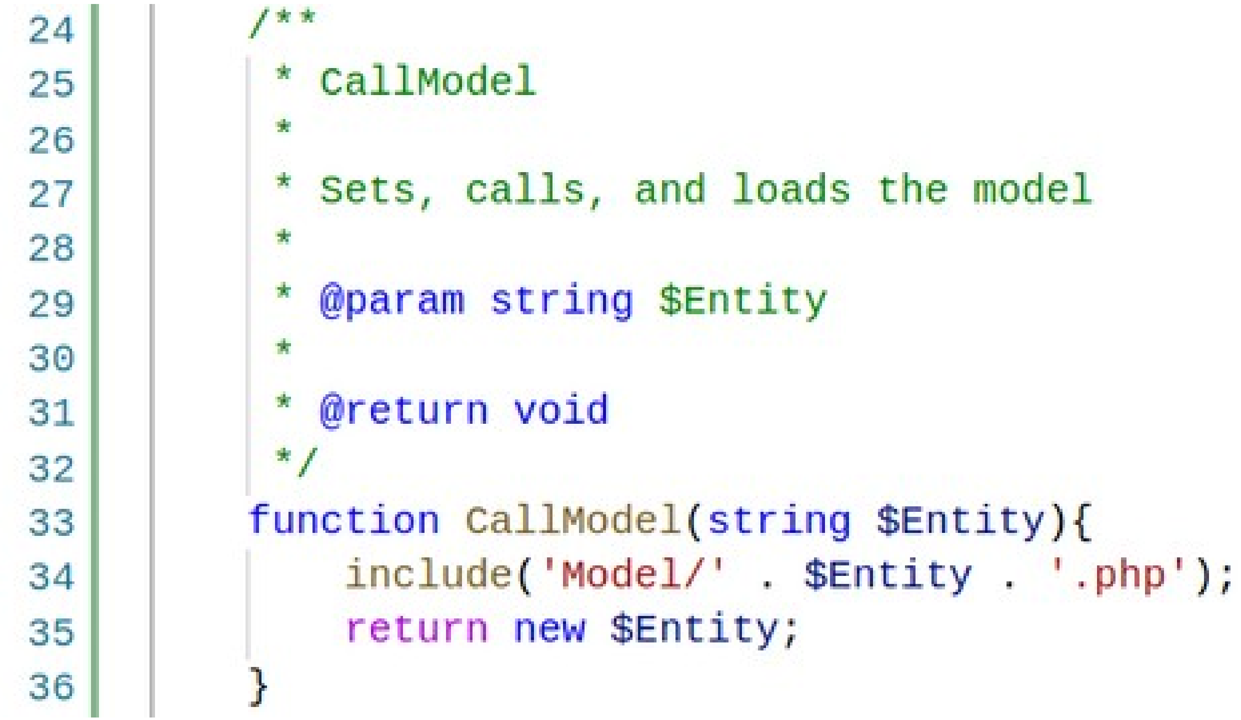
```php
    /**
     * DoQuery
     *
     * Runs a executing query
     *
     * @param  mixed $Query
     * @param  mixed $Values
     *
     * @return void
     */
    function DoQuery($Query, $Values = [])
    {
        $LiveConnection = self::$Connection->prepare($Query);
        foreach ($Values as $Key => $Value) {
            if (gettype($Value) == "integer" || gettype($Value) == "boolean")
                $LiveConnection->bindValue($Key, $Value, PDO::PARAM_INT);
            else
                $LiveConnection->bindValue($Key, $Value);
        }
        return $LiveConnection->execute();
    }
```

Core/Controller.php



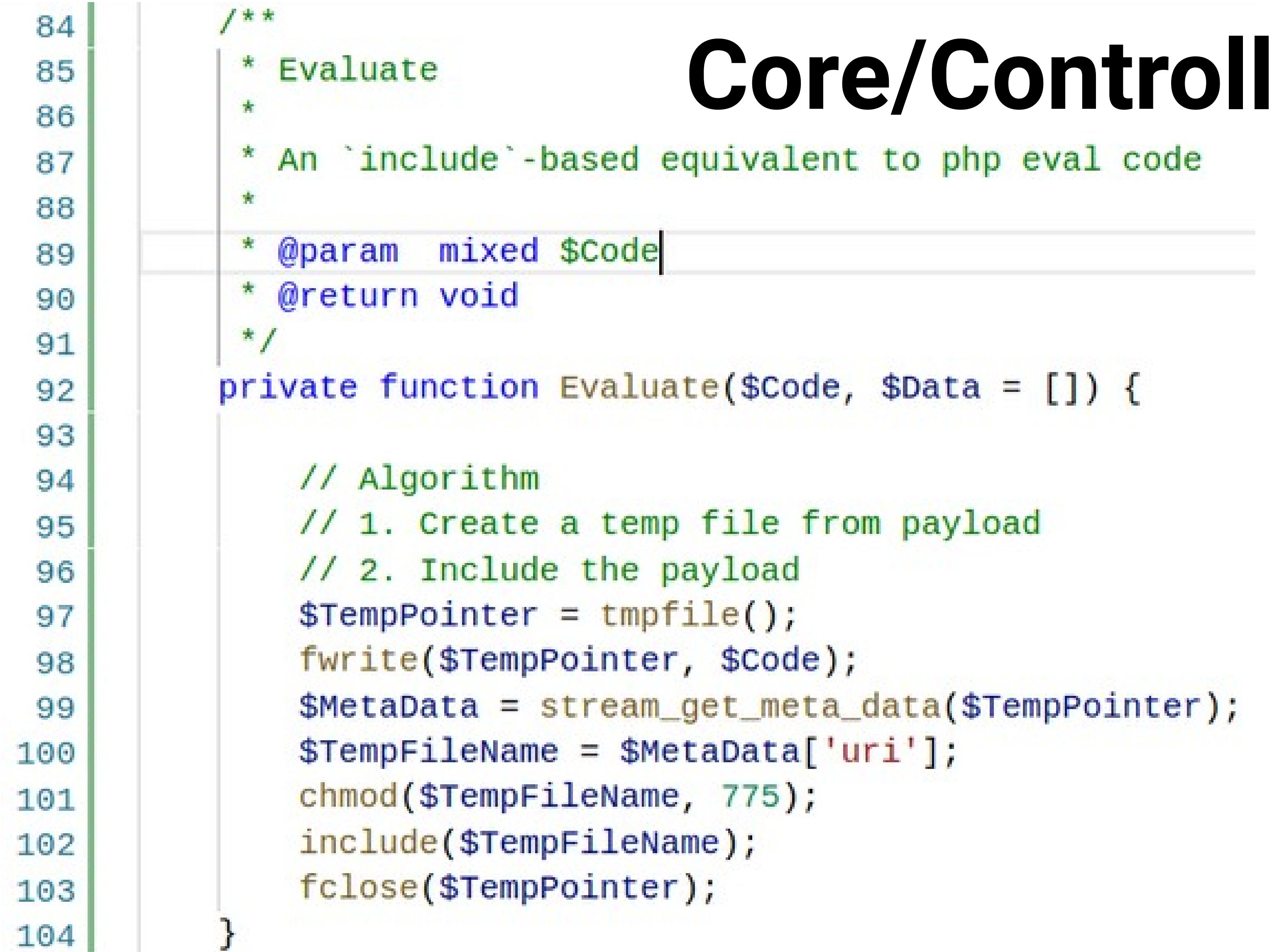
```php
class Controller {

    protected $ViewDirectory;


    /**
     * SetViewDirectory
     *
     * A simple setter for $ViewDirectory
     * which we call it from App.php
     *
     * @param  mixed $Value
     *
     * @return void
     */
    function SetViewDirectory(string $Value){
        $this->ViewDirectory = $Value;
    }
```

Core/Controller.php

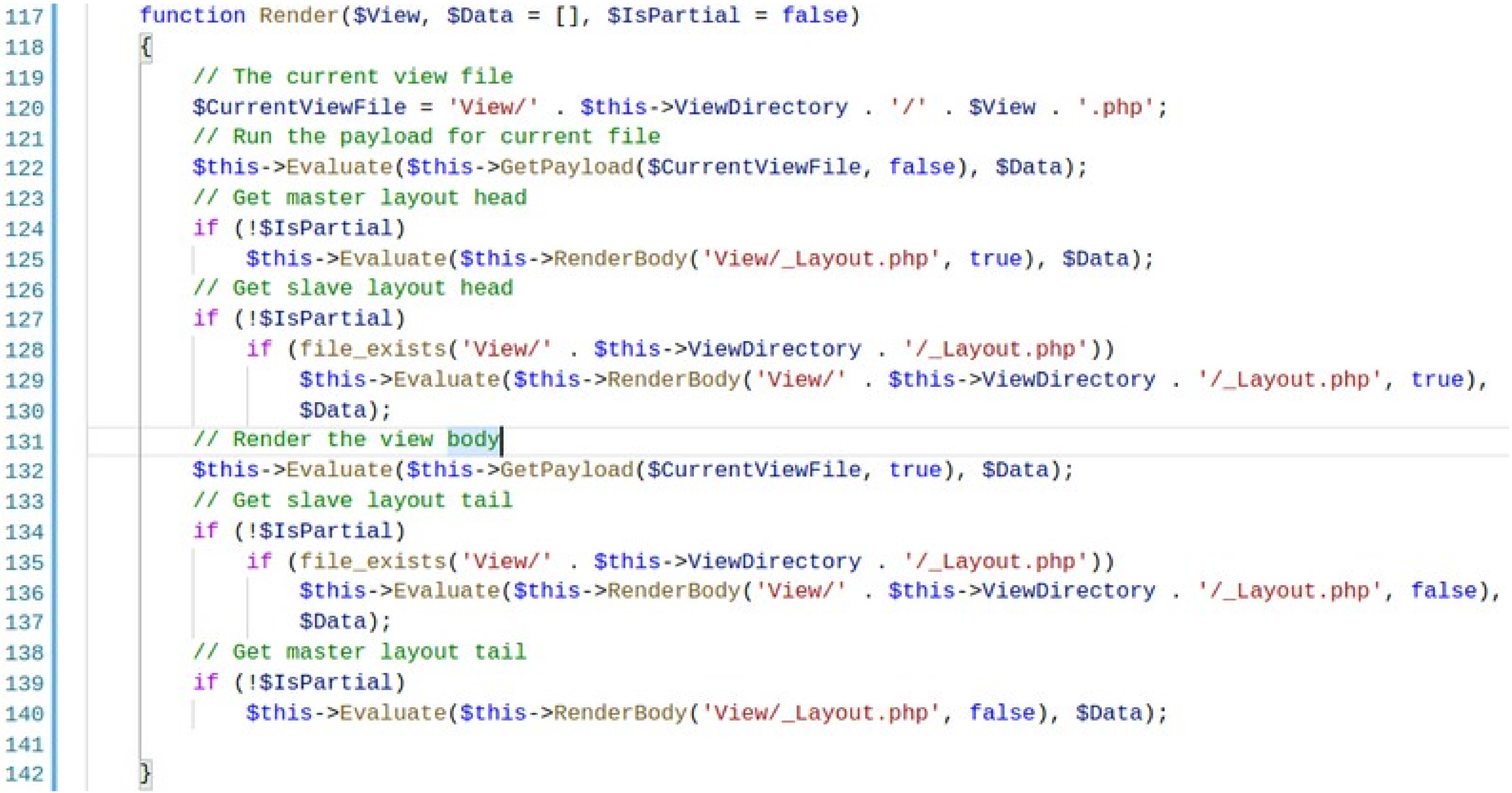


```php
/**
 * CallModel
 *
 * Sets, calls, and loads the model
 *
 * @param string $Entity
 *
 * @return void
 */
function CallModel(string $Entity){
    include('Model/' . $Entity . '.php');
    return new $Entity;
}
```

Core/Controller.php

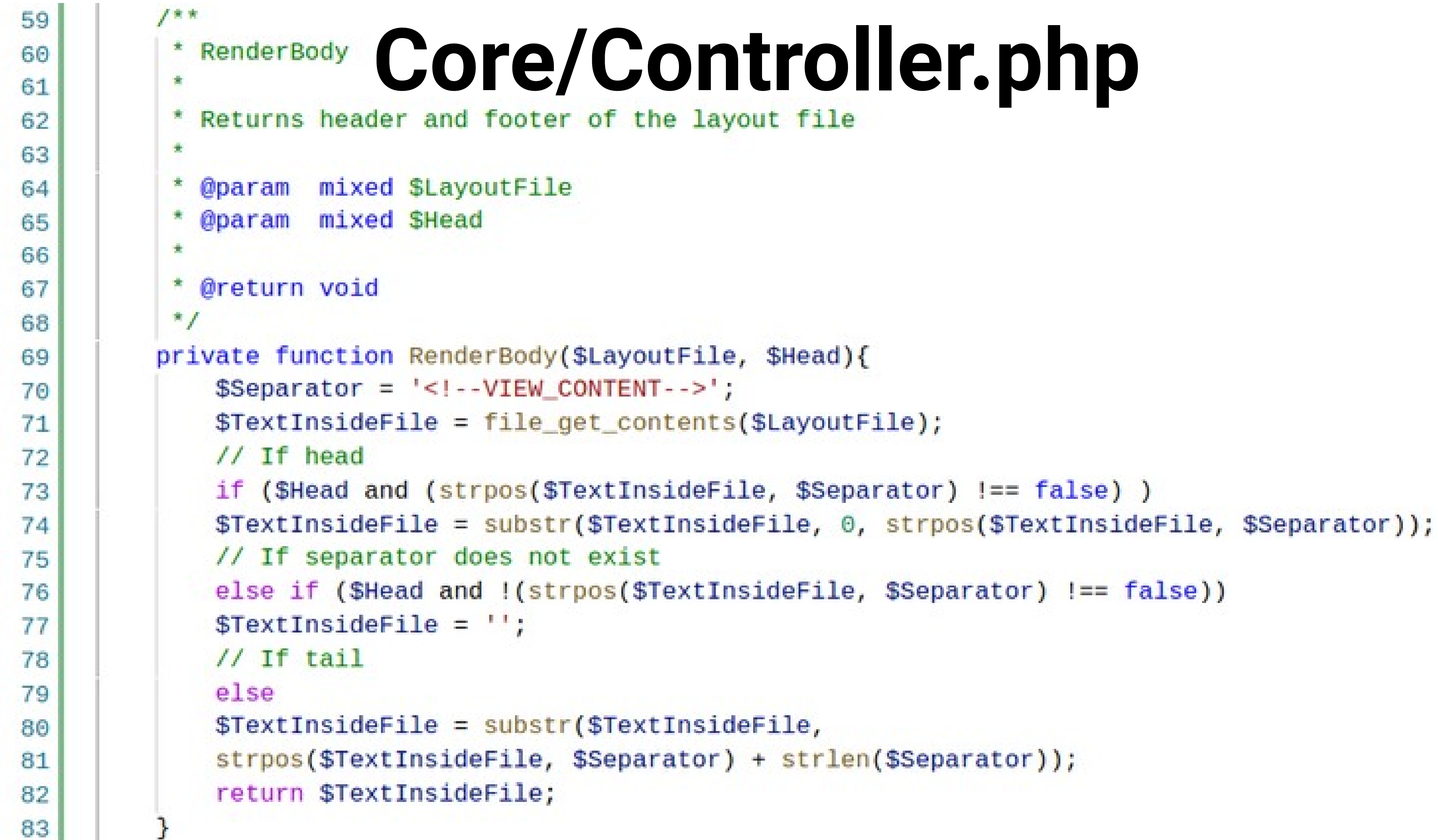


```php
    /**
     * Evaluate
     *
     * An `include`-based equivalent to php eval code
     *
     * @param  mixed $Code
     * @return void
     */
    private function Evaluate($Code, $Data = []) {

        // Algorithm
        // 1. Create a temp file from payload
        // 2. Include the payload
        $TempPointer = tmpfile();
        fwrite($TempPointer, $Code);
        $MetaData = stream_get_meta_data($TempPointer);
        $TempFileName = $MetaData['uri'];
        chmod($TempFileName, 775);
        include($TempFileName);
        fclose($TempPointer);
    }
```



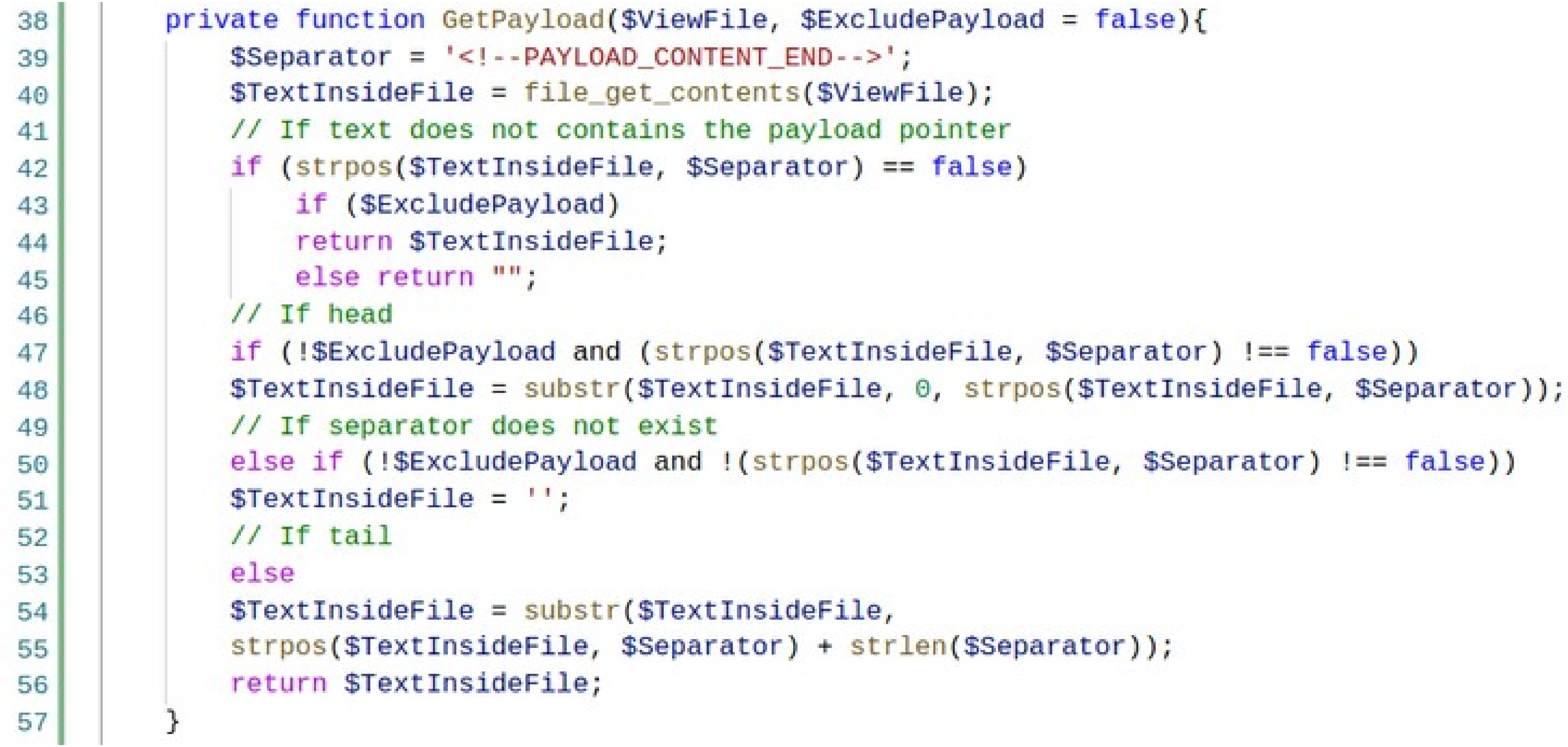
```php
    function Render($View, $Data = [], $IsPartial = false)
    {
        // The current view file
        $CurrentViewFile = 'View/' . $this->ViewDirectory . '/' . $View . '.php';
        // Run the payload for current file
        $this->Evaluate($this->GetPayload($CurrentViewFile, false), $Data);
        // Get master layout head
        if (!$IsPartial)
            $this->Evaluate($this->RenderBody('View/_Layout.php', true), $Data);
        // Get slave layout head
        if (!$IsPartial)
            if (file_exists('View/' . $this->ViewDirectory . '/_Layout.php'))
                $this->Evaluate($this->RenderBody('View/' . $this->ViewDirectory . '/_Layout.php', true),
                $Data);
        // Render the view body
        $this->Evaluate($this->GetPayload($CurrentViewFile, true), $Data);
        // Get slave layout tail
        if (!$IsPartial)
            if (file_exists('View/' . $this->ViewDirectory . '/_Layout.php'))
                $this->Evaluate($this->RenderBody('View/' . $this->ViewDirectory . '/_Layout.php', false),
                $Data);
        // Get master layout tail
        if (!$IsPartial)
            $this->Evaluate($this->RenderBody('View/_Layout.php', false), $Data);

    }
```

Core/Controller.php



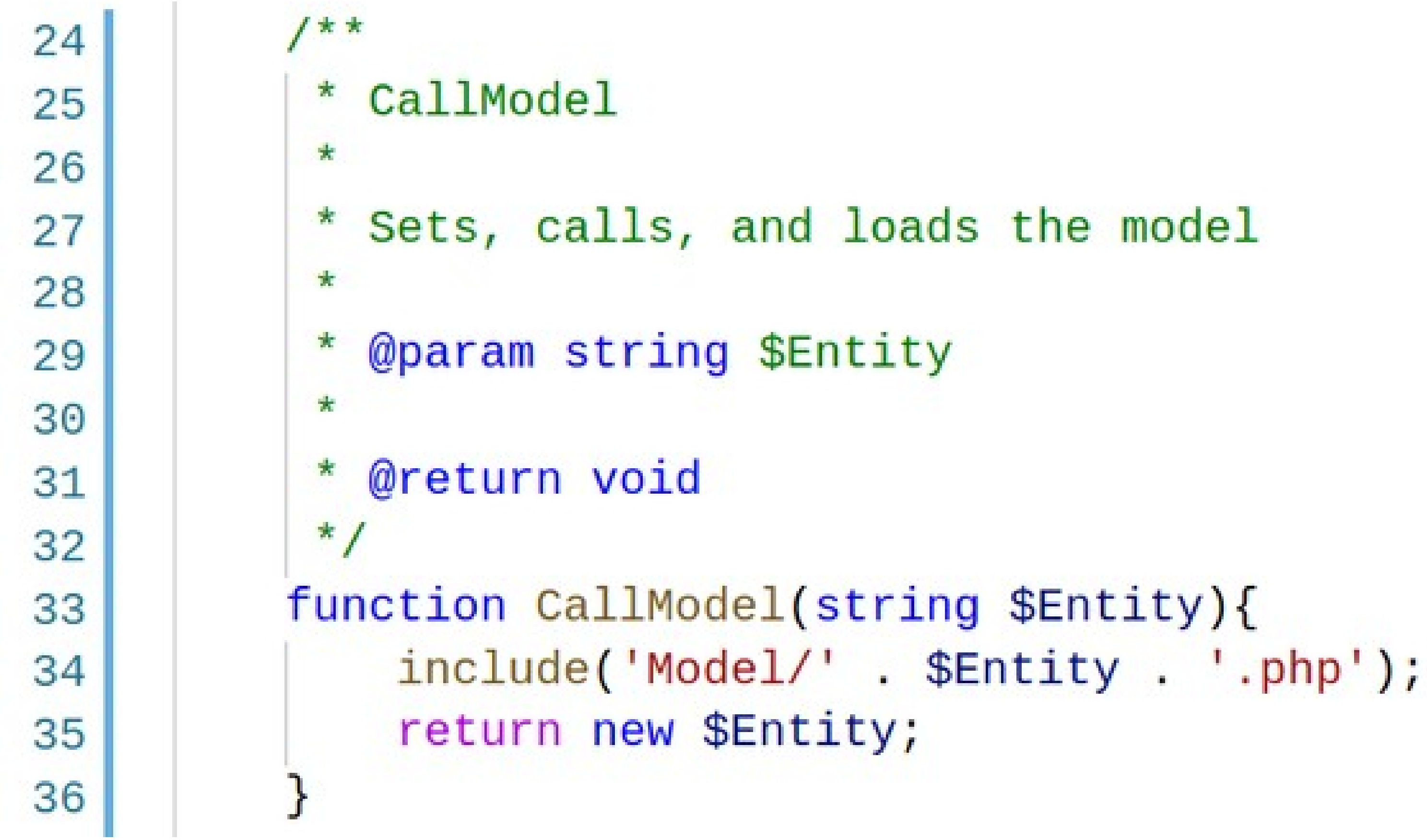
```
/**
 * RenderBody
 *
 * Returns header and footer of the layout file
 *
 * @param  mixed $LayoutFile
 * @param  mixed $Head
 *
 * @return void
 */
private function RenderBody($LayoutFile, $Head){
    $Separator = '<!--VIEW_CONTENT-->';
    $TextInsideFile = file_get_contents($LayoutFile);
    // If head
    if ($Head and (strpos($TextInsideFile, $Separator) !== false) )
    $TextInsideFile = substr($TextInsideFile, 0, strpos($TextInsideFile, $Separator));
    // If separator does not exist
    else if ($Head and !(strpos($TextInsideFile, $Separator) !== false))
    $TextInsideFile = '';
    // If tail
    else
    $TextInsideFile = substr($TextInsideFile,
    strpos($TextInsideFile, $Separator) + strlen($Separator));
    return $TextInsideFile;
}
```

Core/Controller.php



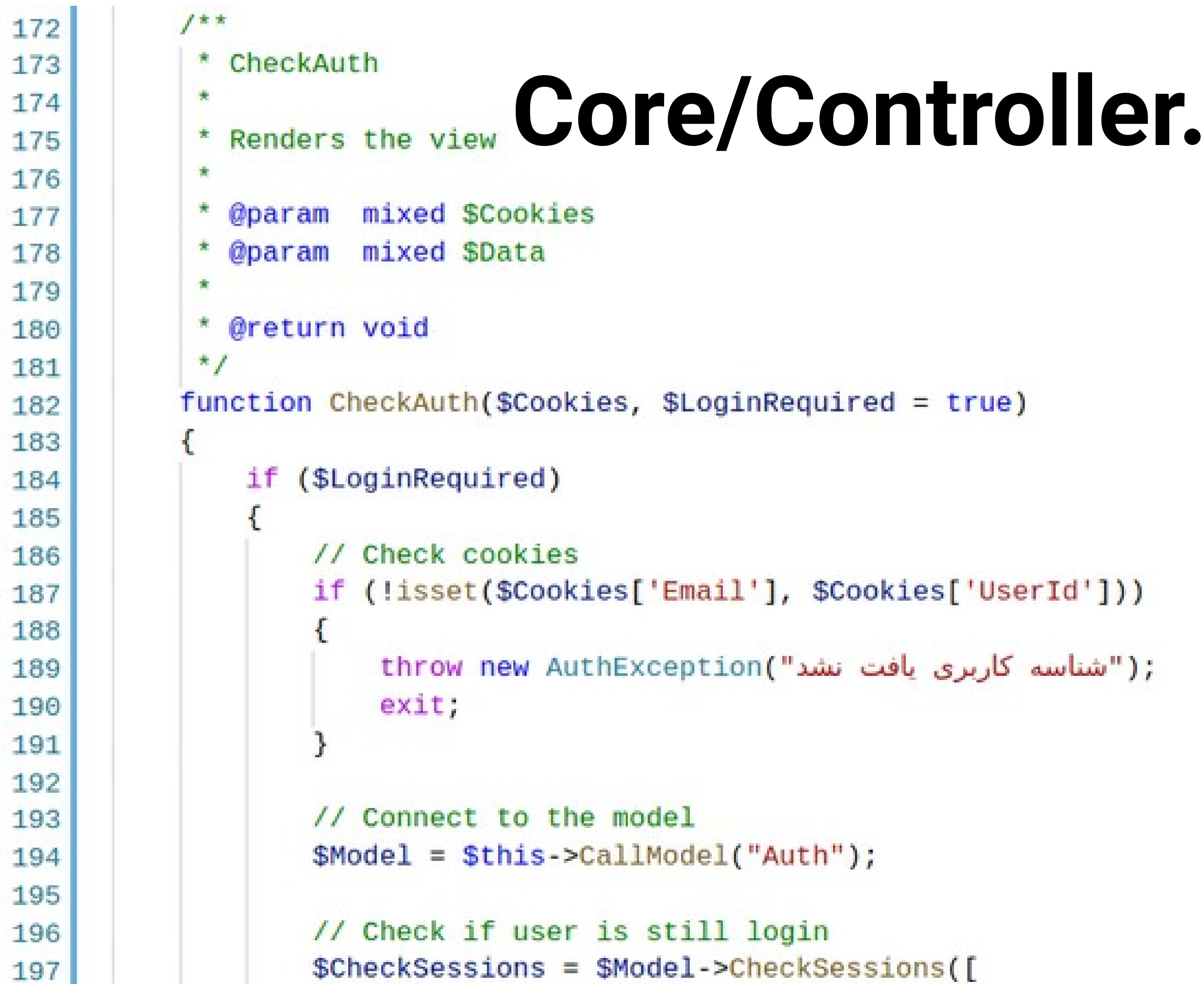
```php
private function GetPayload($ViewFile, $ExcludePayload = false){
    $Separator = '<!--PAYLOAD_CONTENT_END-->';
    $TextInsideFile = file_get_contents($ViewFile);
    // If text does not contains the payload pointer
    if (strpos($TextInsideFile, $Separator) == false)
        if ($ExcludePayload)
        return $TextInsideFile;
        else return "";
    // If head
    if (!$ExcludePayload and (strpos($TextInsideFile, $Separator) !== false))
    $TextInsideFile = substr($TextInsideFile, 0, strpos($TextInsideFile, $Separator));
    // If separator does not exist
    else if (!$ExcludePayload and !(strpos($TextInsideFile, $Separator) !== false))
    $TextInsideFile = '';
    // If tail
    else
    $TextInsideFile = substr($TextInsideFile,
    strpos($TextInsideFile, $Separator) + strlen($Separator));
    return $TextInsideFile;
}
```

Core/Controller.php



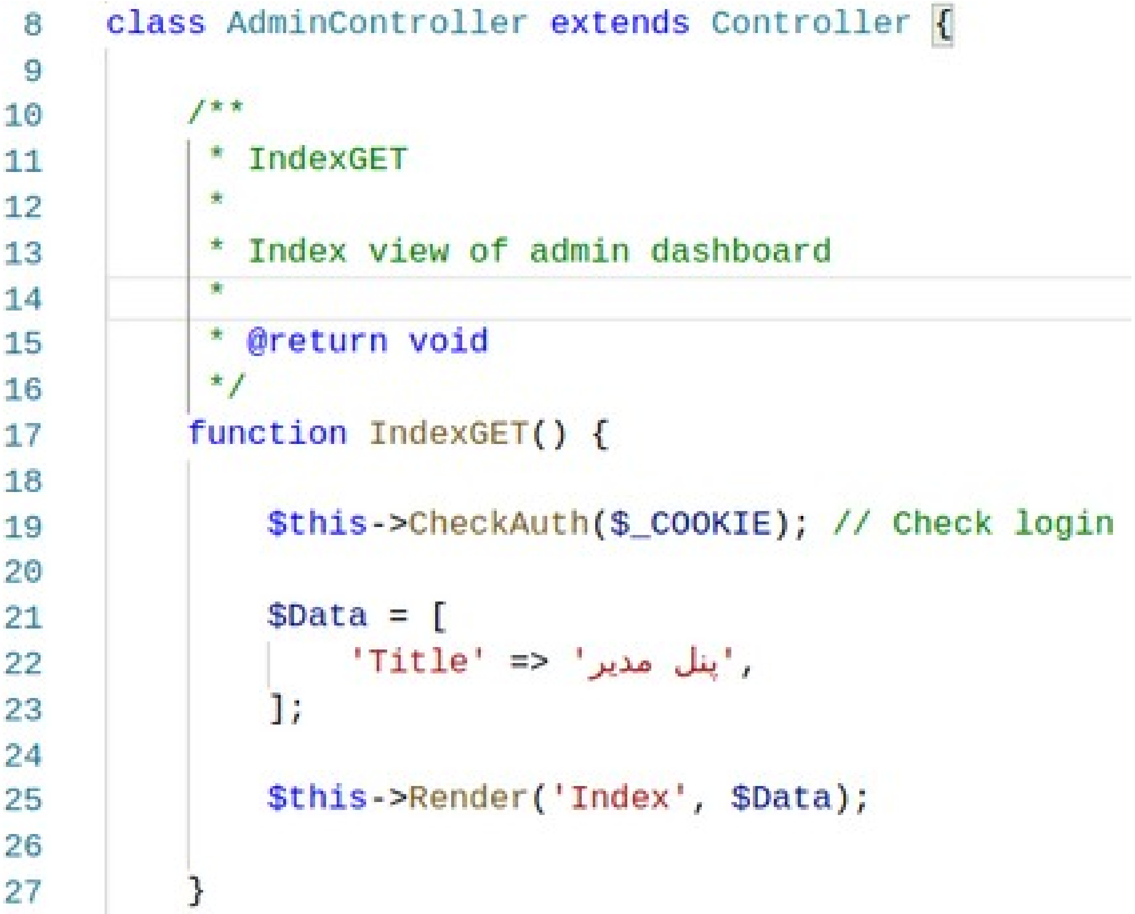
```php
/**
 * CallModel
 *
 * Sets, calls, and loads the model
 *
 * @param string $Entity
 *
 * @return void
 */
function CallModel(string $Entity){
    include('Model/' . $Entity . '.php');
    return new $Entity;
}
```

Core/Controller.php



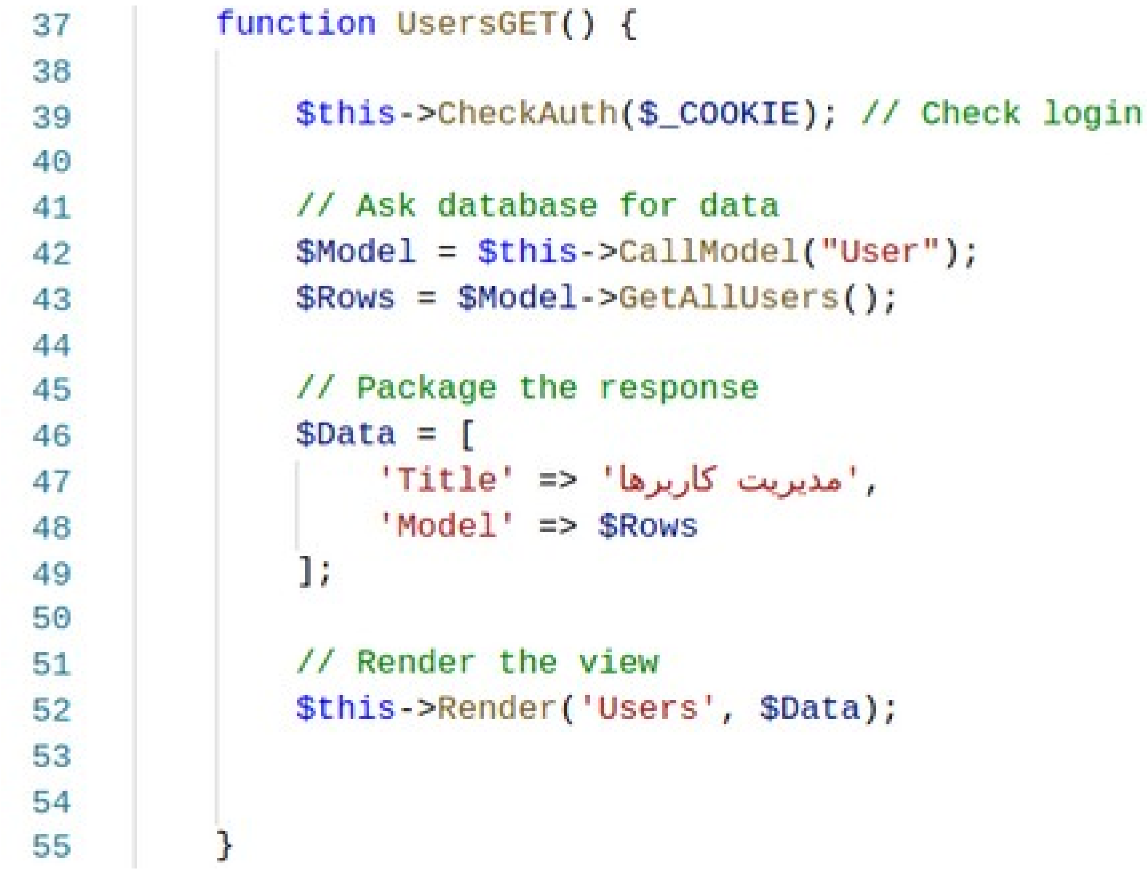
```php
/**
 * CheckAuth
 *
 * Renders the view
 *
 * @param  mixed $Cookies
 * @param  mixed $Data
 *
 * @return void
 */
function CheckAuth($Cookies, $LoginRequired = true)
{
    if ($LoginRequired)
    {
        // Check cookies
        if (!isset($Cookies['Email'], $Cookies['UserId']))
        {
            throw new AuthException("شناسه کاربری یافت نشد");
            exit;
        }

        // Connect to the model
        $Model = $this->CallModel("Auth");

        // Check if user is still login
        $CheckSessions = $Model->CheckSessions([
```

Controller/AdminController.php



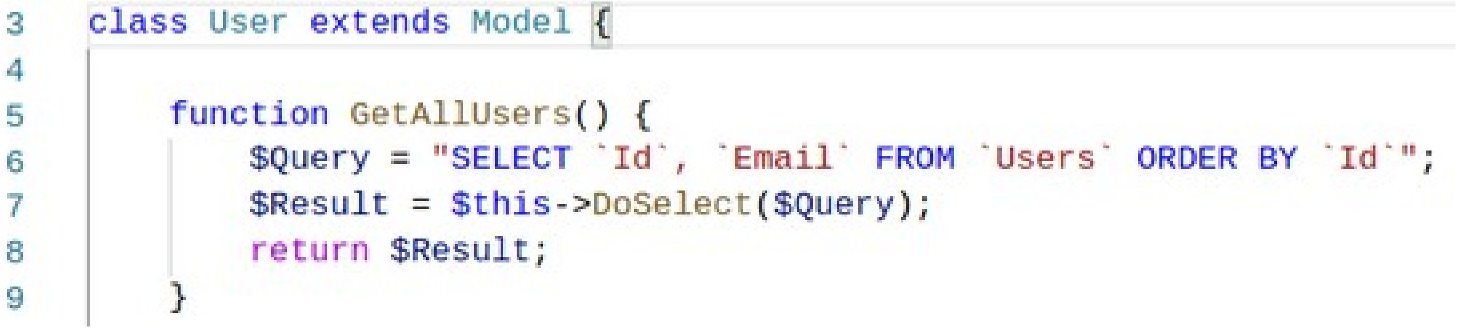
```php
class AdminController extends Controller {

    /**
     * IndexGET
     *
     * Index view of admin dashboard
     *
     * @return void
     */
    function IndexGET() {

        $this->CheckAuth($_COOKIE); // Check login

        $Data = [
            'Title' => 'پنل مدیر',
        ];

        $this->Render('Index', $Data);

    }
```

Controller/AdminController.php



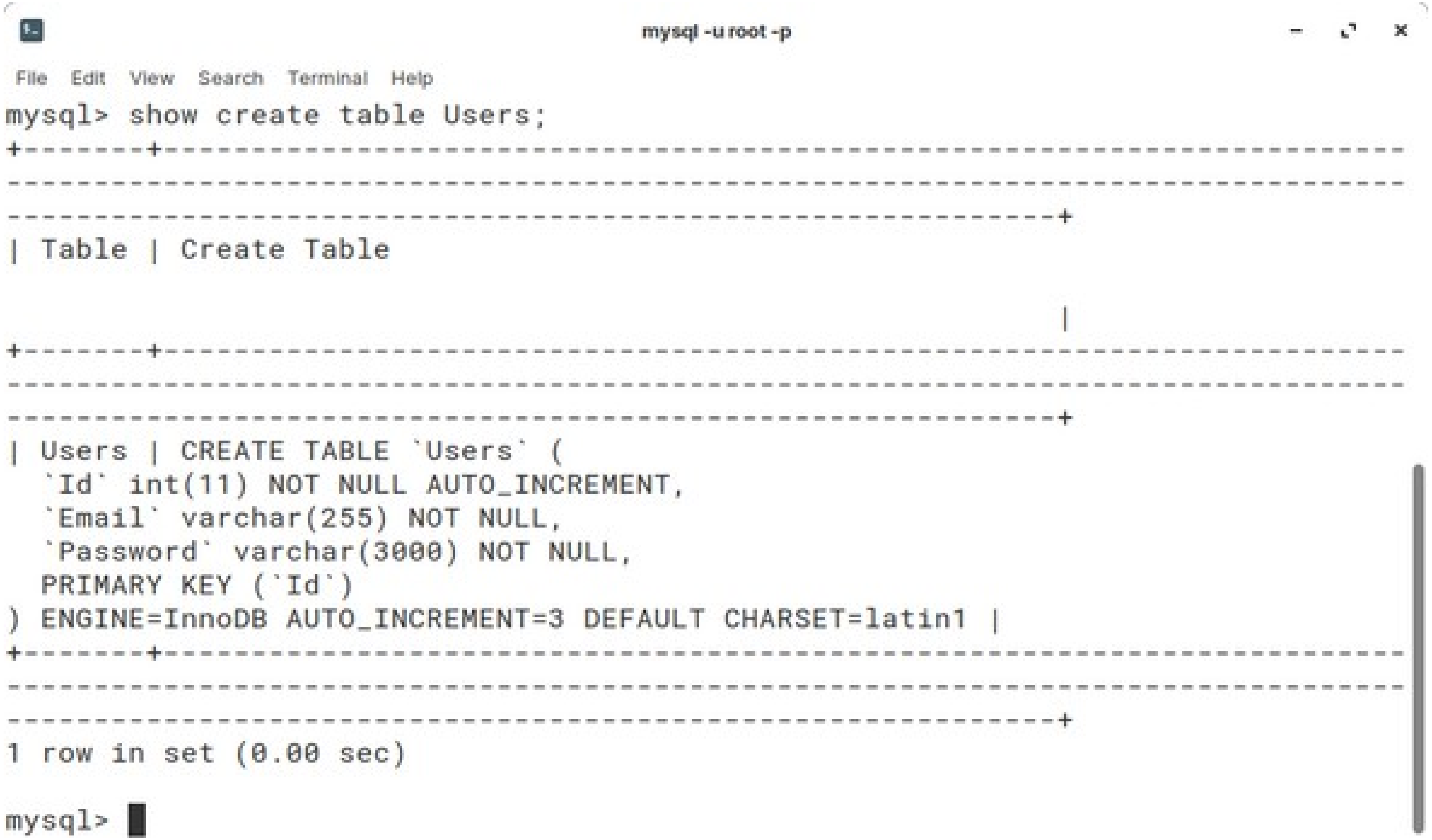
```php
    function UsersGET() {

        $this->CheckAuth($_COOKIE); // Check login

        // Ask database for data
        $Model = $this->CallModel("User");
        $Rows = $Model->GetAllUsers();

        // Package the response
        $Data = [
            'Title' => 'مدیریت کاربرها',
            'Model' => $Rows
        ];

        // Render the view
        $this->Render('Users', $Data);


    }
```

Model/User.php



```php
class User extends Model {

    function GetAllUsers() {
        $Query = "SELECT `Id`, `Email` FROM `Users` ORDER BY `Id`";
        $Result = $this->DoSelect($Query);
        return $Result;
    }
```

Database: Table: Users



```
mysql> show create table Users;
+-------+------------------------------------------------------------------------
--------------------------------------------------------------------------------
------------------------------------------------------------+
| Table | Create Table

                                                            |
+-------+------------------------------------------------------------------------
--------------------------------------------------------------------------------
------------------------------------------------------------+
| Users | CREATE TABLE `Users` (
  `Id` int(11) NOT NULL AUTO_INCREMENT,
  `Email` varchar(255) NOT NULL,
  `Password` varchar(3000) NOT NULL,
  PRIMARY KEY (`Id`)
) ENGINE=InnoDB AUTO_INCREMENT=3 DEFAULT CHARSET=latin1 |
+-------+------------------------------------------------------------------------
--------------------------------------------------------------------------------
------------------------------------------------------------+
1 row in set (0.00 sec)

mysql> 
```

Exercise

Please implement your own core and subclasses.