**Introduction to Dynamic web content**

**LAB # 01**

****

**Spring 2022**

**CSE403L Database Management Science**

Submitted by: **Ashfaq Ahmad**

Registration No: **19PWCSE1795**

Class Section: **B**

Student Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Submitted to:

**Ma’am Naina Said**

May 1, 2022

**Department of Computer Systems Engineering**

**University of Engineering and Technology, Peshawar**

**---------------------------Task 1.1---------------------------**

1. **What four components (at the minimum) are needed to create a fully dynamic web page?**

**Ans:** The four components required to create a fully dynamic web page are:

1. a web server (such as Apache)
2. a server-side scripting language (PHP)3
3. a database (MySQL)
4. scripting language (JavaScript)

**2. What does HTML stand for?**

HTML stands for Hypertext Markup Language is the code that is used to structure a web page and its content. HTML is the basic scripting language used by web browsers to render pages on the World Wide Web. Hypertext allows a user to click a link and be redirected to a new page referenced by that link.

**3. Why does the name MySQL contain the letters SQL?**

**Ans**: Nearly all database engines, MySQL accepts commands in Structured Query Language (SQL). SQL is the way that every user (including a PHP program) communicates with MySQL. PHP and JavaScript are both programming languages that generate dynamic results for web pages.

**4. PHP and JavaScript are both programming languages that generate dynamic results for web pages. What is their main difference, and why would you use both of them?**

**Ans:** It was created for web development but now can be used as a general-purpose language. The main difference from JavaScript is that PHP is a server-side language used for back-end and executed on the server. It has more features, richer libraries, and better security compared to JS.

|  |  |
| --- | --- |
| **PHP** | **Java script** |
| 1. **Server\_side scripting language** | 1. **Client\_side scripting language** |
| 1. **Used for back\_end development** | **2. Mainly used for front\_end development.** |
| 1. **More secure.** | **3. Has tools for enhancing security need more efforts to to do** |
| 1. **Combined with HTML** | **4. fast performance** |

1. **What does CSS stand for?**

**Ans:** CSS stands for Cascading Style Sheets CSS describes how HTML elements are to be displayed on screen, paper, or in other media CSS saves a lot of work. It can control the layout of multiple web pages all at once External stylesheets are stored in CSS files.

1. **List three major new elements introduced in HTML5.**

**Ans:** The following tags (elements) have been introduced in HTML5 –

|  |  |
| --- | --- |
| **Tags (Elements)** | **Description** |
| <article> | Represents an independent piece of content of a document, such as a blog entry or newspaper article |
| <aside > | Represents a piece of content that is only slightly related to the rest of the page. |
| <audio> | Defines an audio file. |

1. **If you encounter a bug (which is rare) in one of the open source tools, how do you think you could get it fixed?**

Ans: Some of these technologies are controlled by companies that accept bug reports and fix the errors like any software company.

**---------------------------Task 1.3---------------------------**

**What is a Framework? List top three frameworks used for PHP language. How do these help developers?**

**Ans:**A PHP framework is a platform to build PHP web applications. PHP frameworks provide libraries for commonly used functions, which helps to cut down on the amount of original code developers need to write from scratch. A PHP framework provides a basic foundation for the development of web applications in PHP.

**List of three frameworks:**

1. **Laravel**

Topping our list is the new yet extremely popular (if not the most popular) framework. Released in 2011, Laravel has swept the framework arena off its feet and has been topping charts for quite some time now. The immense popularity can be attributed to its ability to handle complex web applications with additional security and speed when compared to other frameworks.

Developers also prefer Laravel as it offers a vast ecosystem, which brings instant hosting and deployment platform, along with screencast tutorials hosted by the official Laravel website. The framework also features Homestead, a Vagrant box (prepackaged development environment) which assists in hassle-free development. Other features include a strong encryption package(s), overloading capabilities using dynamic methods and tons of out of box functionality. It is easy, to begin with Laravel due to the availability of extensive documentation and plenty of online resources to learn.

### ****Symfony****

### Launched in 2005, [Symfony](https://symfony.com/) has existed far longer than most PHP frameworks in the business, which showcases that it has held the trust of developers for over a decade, maturing with its age. The framework is an extensive PHP framework, and it is the sole framework which follows the standards of PHP and web completely. Symfony components are used by popular content management systems such as Drupal, OroCRM, and PHP Bulletin Board (PHPBB).Symphony is the first choice for many developers due to the availability of reusable libraries and components using which you can complete a variety of tasks such as authentication, templating, object configuration and much more. Symfony comes out as the perfect choice among PHP frameworks when it comes to large-scale enterprise assignments. Moreover, the Symfony ecosystem is massive and is supported by a highly active programming community and has tons of great onlin for you to get started.

### ****CodeIgnite****

### ****codeligter**** is a lightweight framework that's known for its small footprint and hassle-free installation with minimalistic configuration prerequisites. Simple yet powerful, CodeIgniter is a mere 2MB in size, which even includes the documentation. It is highly suitable for the development of dynamic websites, as it offers many prebuilt modules that help in the construction of strong and reusable components. What adds to its popularity is its smooth working on shared as well as dedicated hosting platforms. It is also considerably faster when compared to other frameworks. Due to its solid performance and faster speed, it is the best choice when developing lightweight applications that run on simple servers. Multiple other features of CodeIgniter include simple security, encryption steps, easy error handling, and negligible PHP adoption struggle. The framework is very well documented, and it is an excellent choice for beginners. Here are the community-recommended best onlin CodeIgniter thing to note is that the framework updates are quite jagged, so it will not be the best option for applications that demand high-level security.

### ---------------------------Task 1.4---------------------------

### What is the difference between Library and Framework?

### Libraries provide developers with predefined functions and classes to make their work easier and boost the development process. Framework, on the other hand, is like the foundation upon which developers build applications for specific platforms.

|  |  |  |
| --- | --- | --- |
| **Parameters** | **Library** | **Framework** |
| Definition | Libraries provide developers with predefined functions and classes to make their work easier and boost the development process. | Framework, on the other hand, is like the foundation upon which developers build applications for specific platforms. |
| Inversion of Control | By using a library, you can control the flow of the application and call the library. | In contrast, when you use a framework, the control is inverted, i.e., the framework controls the flow and calls your code. |
| Collection | Generally, libraries are a collection of helper modules, objects, classes, functions, message templates, pre-written code, etc. | Frameworks consist of a lot of APIs, compilers, toolsets, support programs, libraries, etc. |
| Code Modification | Codes in libraries are geared toward a particular program or to solve a specific development problem. Therefore, developers must modify library code to meet their needs. | Despite the fact that frameworks generate new codes for developers. These codes cannot be altered or modified later. Unlike libraries, frameworks do not allow users to modify their pre-written codes, so you don’t have to worry about deleting or changing them. |
| Scope | It is possible to call a library out of context. You may use the library wherever you see fit in your code. | On the other hand, you can only call and use what belongs to a Framework within the same Framework. |
| Function | In the program linking and binding process, they play an important role. | Using them, you can build and deploy applications in a standard way as the framework already provides code to perform common tasks and uses code provided by a developer for custom functionality. |
| Complexity | Having a library means understanding the functionality of each method, and it isn’t easy to create complex interactions since you need to call many methods to get the desired results. | Frameworks, on the other hand, embody the basic flow, and since plugins need to be added to code, it is easier to do the right modification. |
| Extensibility | Generally, libraries aren’t designed for extensibility; they are designed to accomplish a specific purpose. | Frameworks provide general functionality. Because of this, they are built to be extensible, which allows developers to incorporate app-specific features without modifying the framework’s source code. |
| Replaceable | It is easy to replace a library with another library. For instance, if you do not like the jQuery date picker library, you can use another date picker like a bootstrap date picker or pick date. | Frameworks are difficult to replace. If, for instance, you were using AngularJS to build your product, you cannot simply swap it out for another framework. It requires rewriting the entire codebase. |
| Performance | Less code is required to build libraries, which leads to faster loading times and better performance. | Developing a framework requires a lot of coding, which increases loading times and decreases performance. |
| Usage | The purpose of libraries is to perform a defined and specific task. Eg: Image manipulation, network protocols, math operations, etc. | Frameworks can be used for performing a wide range of tasks. Among these are Web application systems, plug-in managers, GUI systems, and so on. |
| Existing Projects | You can integrate libraries seamlessly into existing projects to add functionality. | Incorporating frameworks seamlessly into an existing project is impossible. Instead, frameworks should be used when starting a new project. |
| Benefits | Good code quality, reusability, and control, enhanced speed and performance of the program, etc. | Faster programming, support from the community, great support for MVC (Model View Controller) pattern, etc. |
| Examples | JQuery, React JS, etc. | Spring, NodeJS, AngularJS, Vue JS, etc. |

## Conclusion: In general, libraries tell you what to do and frameworks let you know what to do. Frameworks are better than libraries, or vice versa; however, it is ultimately a matter of use cases and situations rather than the tool itself.

**---------------------------Task 1.5---------------------------**

**What is PHP MVC Framework? Give examples. (HINT: LARAVEL, CODEIGNITER, etc).**

Ans: PHP MVC is **an application design pattern that separates the application data and business logic (model) from the presentation (view)**. MVC stands for Model, View & Controller. The controller mediates between the models and views. Think of the MVC design pattern as a car and the driver.

Example:

## Creating Our Model

Next we are going to create our model that will extend the CI\_Model. The CI\_Model is part of the CodeIgniter libraries. The model will be located in application/models *opinion\_poll\_model.php*

<?php

class Opinion\_poll\_model extends CI\_Model

{

public function \_\_construct ()

{

$this->load->database ();

}

public function total\_votes()

{

$query = $this->db->select('COUNT(choice) as choices count')->get('syllabaries');

return $query->row()->choices\_count;

}

public function get\_results()

{

$libraries = array("", "JQuery", "MooTools", "YUI Library", "Glow");

$table\_rows = '';

for ($i = 1; $i< 5; $i++)

{

$sql\_stmt = "SELECT COUNT(choice) choices\_count FROM js\_libraries WHERE choice = $i;";

$result = $model->

select($sql\_stmt); $table\_rows .= "<tr><td>" . $ libraries [$i] . " Got:</td><td><b>" . $result[0] . "</b> votes</td></tr>";

}

public function add\_vote($choice)

{

$ts = date("Y-m-d H:i:s"); $data = array('choice' => $choice, 'ts' => $ts); $this->db->insert('js\_libraries', $data);

}

}

?>

**---------------------------Task 1.6---------------------------**

What differences do you see in SQL and NoSQL Databases? Mention in detail. (HINT: SQL Databases include MySQL, ORACLE, SQLITE, MS ACCESS, etc; while NOSQL Databases include MongoDB, CouchDB, HBase, Cassendra, Neo4j, etc.)

Ans: SQL databases are vertically scalable, while NoSQL databases are horizontally scalable. SQL databases are table-based, while NoSQL databases are document, key-value, graph, or wide-column stores. SQL databases are better for multi-row transactions, while NoSQL is better for unstructured data like documents or JSON.

The five critical differences between SQL vs NoSQL are:

1. SQL databases are relational, NoSQL databases are non-relational.
2. SQL databases use structured query language and have a predefined schema. NoSQL databases have dynamic schemas for unstructured data.
3. SQL databases are vertically scalable, while NoSQL databases are horizontally scalable.
4. SQL databases are table-based, while NoSQL databases are document, key-value, graph, or wide-column stores.
5. SQL databases are better for multi-row transactions, while NoSQL is better for unstructured data like documents or JSON.

## **SQL Database Systems**

Now that you know the key differences between SQL and NoSQL databases, it’s time to explore the different options available for your workloads.

### MySQL

* Free and open-source
* Extremely established database with a huge community, extensive testing, and lots of stability
* Available for all major platforms
* Replication and sharding are available
* Covers a wide range of use cases

### Oracle

* Commercial database with frequent updates, professional management, and excellent customer support
* Procedural Language/SQL or PL/SQL is the SQL dialect used
* One of the most expensive database solutions
* Works with huge databases
* Simple upgrades
* Transaction control
* Compatible with all operating systems

**NoSQL Database Systems**

MongoDB is by far the most popular NoSQL database, and for good reason. Its features and benefits include:

* Free to use
* Dynamic schema
* Horizontally scalable
* Excellent performance with simple queries
* Add new columns and fields without impacting your existing rows or the application’s performance

MongoDB works best for companies that are going through rapid growth stages or those with a lot of unstructured data. Lesser-known alternatives to this NoSQL database are available, such as:

* Apache Cassandra
* Google Cloud Bigtable
* Apache HBase

**---------------------------Task 1.7---------------------------**

**What is web hosting and domain? List some popular hosting websites.**

**Hosting:**

When you want to start a business in the real world, you need a physical location to set up, store, and sell your products. The same rules apply in the digital world when setting up a website. When you set up an online business, you have a series of files, images, and HTML code that make up your website. These files take up space and need a place to live. Without an online home, your files would just sit on your computer and no one would ever see them. A hosting provider will provide a place on a web server to store all of your files and are responsible for delivering the files of your website as soon as a browser makes a request by typing in your domain name. When you pay for hosting services, you are simply renting storage space on the internet — just like you would rent a physical store for your business.

**Domain name**:

Before we go into more depth, let’s talk about domain names. When you first thought about starting an online business, you purchased a domain name. A domain name is your company’s address on the internet. Think of it this way: if you are renting space at a physical location for your business, you give customers your street address so they can find you. If you are renting space on the internet, you give customers your domain name. Whenever someone types in your domain name, it is converted into an IP address. The hosting company then locates all the files connected to your IP address and returns all of the pictures, videos, and words that make up your website.

Just like every street address is unique, so is every domain name. Whenever you start a new website, you get the opportunity to choose name that reflects your brand.

**Some popular hosting website**:

* Holsinger – Most affordable hosting plans.
* Bluehost – Best web host for beginners.
* Dream host – Most affordable month-to-month plan.
* HostGator – Best for lean/minimal needs.
* Green Geeks – Best eco-friendly hosting.
* Site Ground – Best for making your WordPress site speedy & secure.