Continuing Education Program

Center for Computing and Information Technology

Faculty of Engineering

University of Indonesia

ISAS (Information Search and Analysis Skill)

“Architecture Technology of Code Igniter”

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Preface

First, Let us give praise to Allah S.W.T who give guidance to us untill we can complete our ISAS entitled "Architecture Technology of Code Igniter". As author write this article, author get a lot of support from various parties. Among others are :

1. Our parents, who always help in the form of spirit and material.
2. Dr. Aries Subiantoro, M.Sc as director of CCIT Faculty of Engineering, University of Indonesia.
3. Indah Ayu Yuliani S.T, M.M as our faculty who have provided guidance and support and referrals to us so that we can finish ISAS.
4. Our friends who always give the information that they know, exchange ideas and give encouragement to us in writing this article.

Author know that the results of this article is far from perfect and there are still many shortcomings, author hope readers will give comments and suggestions in building this article in order to become better. We hope this article can be useful for those who read or hear, especially for CCIT students of the Faculty of Engineering UI.

Our ISAS titled "Architecture Technology of Code Igniter" is Introduction of Framework from PHP Programming Language, with this framework we can easily make website more secure and quickly. We hope with this ISAS people will understand about introduction of Code Igniter Framework.

Depok, November 2016

Author

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INTRODUCTION

I.1 Background

Web application development growing with current technology development. Before mobile application development being a trend, web application development is one of the programming trend. The cause is before mobile application development founded, all of data are stored online via internet. The data which stored in internet will be displayed at the front end of website. But due to rapid technological changes, a lot of people trying to found something better to solve old problem. Every developer trying to develop programming language that can be a general programming language. The purpose is to make one programming language that can be accessed by every people in this world and can be developed by all of developer.

In 1995, *Rasmus Lerdorf* created PHP programming language. At that years, PHP programming language still based on C programming. The purpose of this invent is to process data from web forms. PHP published as open source programming language, its mean every people can develop and using PHP without cost. The more technology develops, PHP also developed by a lot of developer. One of company that develop PHP is *Zend*. Zend develops PHP to be cleaner, neater, and faster. PHP created as web programming language, along with the technology development. PHP native is not secure and very slow for programmer when making a website. That's the reason why developer create programming framework to make developer works more easy and the security of web better than PHP native.

Code Igniter is one of PHP Framework. Code Igniter created by EllisLab. The purpose of this invent is to make developer easy and faster when create a website. Code Igniter is framework based on MVC (Model View Controller). With Code Igniter, Developer can develop a website quickly and safer rather than using normal PHP. Today, Code Igniter used by a lot of developer in the whole world. Especially in Indonesia, Code Igniter is one of top programming language that used by a lot of developer to develop a website.

Because PHP and Code Igniter is free to use without cost. A lot of developer and student programmer like to use them to develop any website. The purpose is to study about architecture of Code Igniter.

1.2 Writing Objective

The purpose of this ISAS are :

1. Definition of programming language.
2. Definition of PHP programming language.
3. History of PHP Programming language.
4. Definition of MVC Pattern
5. Definition of Framework.
6. Definition of Code Igniter.
7. Knowing the controller scope of Code Igniter.
8. Knowing how to setup Code Igniter.

1.3 Problem Domain

Accordance with the title of ISAS "Architecture Technology of Code Igniter" We will discuss about :

1. Definition of Code Igniter
2. Code Igniter's Controller Scope
3. How To Setup Code Igniter

1.4 Writing Methodology

The method which used in this ISAS is the method of browsing from internet, reading online journal, and make a survey in problem domain.

1.5 Writing Framework

The paper was written by systematic as follows :

CHAPTER I : INTRODUCTION

1.1 Background

Discusses the web application development, PHP programming language history, and Code Igniter framework history.

1.2 Writing Objective

The purpose of this article is to understand about PHP, Code Igniter, MVC and simple steps to build website with Code Igniter.

1.3 Problem Domain

First, tell about the model MVC Pattern of Code Igniter, this model is a builder to build web application with Code Igniter. Second, tell about Code Igniter's Controller Scope,

describe each function of Code Igniter part such as Controller, Model, Library, Helper, and View.

1.4 Methodology Writing

To get data which needed, this paper use the method of observing or direct observation techniques, author reads famous repository online journal such as Science Direct.

1.5 Writing Framework

This paper Writing Framework consists of four Chapter, the first chapter is introduction which tells the background, writing objective, several problem domain, methodology writing and writing framework of this paper.

Chapter II Basic of Theory

In chapter II, paper written several sub chapter. The first sub chapter is to tell about briefly description about programming language. The second sub chapter is to tell about PHP Programming Language. The third sub chapter is to tell about Code Igniter Programming Language. The fourth sub chapter is to tell about architecture technology of Code Igniter.

Chapter III Problem Analysis

Analyzing and solve the problem that contained in problem domain.

Chapter IV Conclusion and Suggestion

Conclude and suggest related to this paper.

CHAPTER II

BASIC OF THEORY

II.1 Programming Language : Briefly Description

Programming language is collection of code program languages to create applications and leads to highly entangled and unmaintainable code. Programming language using logic to build the application and data storage in an application to save the data. [1]

II.2 Definition of PHP Programming Language

PHP programming language is a combine of HTML code with server side programming languages to create dynamic web pages. PHP can be save at hosting and the hosting can be accessed via domain name. Programmer choose PHP because easiness of PHP and it's free. [1]

II.3 History of PHP Programming Language

PHP as it's known today is actually the successor to a product named PHP/FI. Created in 1994 by Rasmus Lerdorf, the very first incarnation of PHP was a simple set of Common Gateway Interface (CGI) binaries written in the C programming language. Originally used for tracking visits to his online resume, he named the suite of scripts "Personal Home Page Tools," more frequently referenced as "PHP Tools". Over time, more functionality was desired, and Rasmus rewrote PHP Tools, producing a much larger and richer implementation. This new model was capable of database interaction and more, providing a framework upon which users could develop simple dynamic web applications such as guestbooks. In June of 1995, Rasmus released the source code for PHP Tools to the public, which allowed developers to use it as they saw fit. This also permitted - and encouraged - users to provide fixes for bugs in the code, and to generally improve upon it. Ough it lived a short development life, it continued to enjoy a growing popularity in still-young world of web development. In 1997 and 1998, PHP/FI had a cult of several thousand users around the world. A Netcraft survey as of May, 1998, indicated that nearly 60,000 domains reported having headers containing "PHP", indicating that the host server did indeed have it installed. This number equated to approximately 1% of all domains on the Internet at the time. Despite these impressive figures, the maturation of PHP/FI was doomed to limitations; while there were several minor contributors, it was still primarily developed by an individual. [4]

II.4 Benefit of PHP Programming Language

There are two benefit using PHP as programming language to build a website. There are :

1. PHP can interact with many different database languages such as MySQL, SQL Server, Mongo DB and others. But a lot of programmer prefer using MySQL as their database.
2. PHP and MySQL are compatible with Apache server. Apache server is a free server. Third, PHP can run on multiplatform such as Linux, Windows, Mac, and Unix Servers.
3. Easy to code because the syntax is easy to use.
4. PHP is open source, so people is free to use and doesn't need to pay.
5. Have a lot of documentation at the internet, so it will help to fix the code when got an error.
6. When deploy on the Apache server, the cost is cheaper than using other languages.
7. A lot of people know PHP and other programmer can help when problems occur. [3]

II.5 Definition of Programming Framework

A *framework* is a hierarchical directory that encapsulates shared resources, such as a dynamic shared library, nib files, image files, localized strings, header files, and reference documentation in a single package. Multiple applications can use all of these resources simultaneously. The system loads them into memory as needed and shares the one copy of the resource among all applications whenever possible.

A framework is also a bundle and its contents can be accessed using Core Foundation Bundle Services or the Cocoa NSBundle class. However, unlike most bundles, a framework bundle does not appear in the Finder as an opaque file. A framework bundle is a standard directory that the user can navigate. This makes it easier for developers to browse the framework contents and view any included documentation and header files.

Frameworks serve the same purpose as static and dynamic shared libraries, that is, they provide a library of routines that can be called by an application to perform a specific task. For example, the Application Kit and Foundation frameworks provide the programmatic interfaces for the Cocoa classes and methods. Frameworks offer the following advantages over static-linked libraries and other types of dynamic shared libraries:

- Frameworks group related, but separate, resources together. This grouping makes it easier to install, uninstall, and locate those resources.

- Frameworks can include a wider variety of resource types than libraries. For example, a framework can include any relevant header files and documentation.
- Multiple versions of a framework can be included in the same bundle. This makes it possible to be backward compatible with older programs.
- Only one copy of a framework's read-only resources reside physically in-memory at any given time, regardless of how many processes are using those resources. This sharing of resources reduces the memory footprint of the system and helps improve performance. [2]

II.6 MVC Pattern

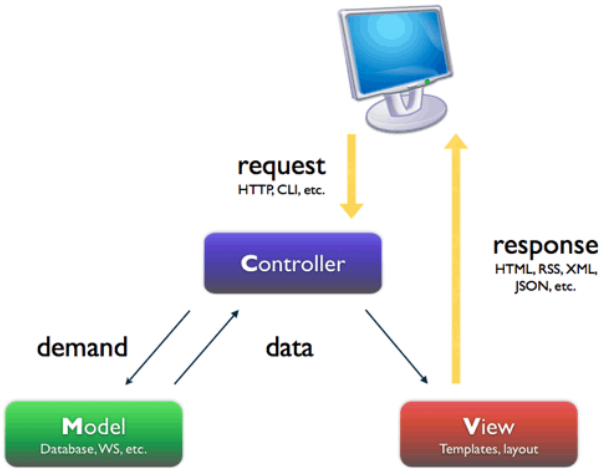

Figure 2.0 MVC Pattern

Source: http://stackoverflow.com/questions/5966905/which-mvc-diagram-is-correct-web-app

The MVC design pattern is good for web application because they split the database function, the function code and display separately and structured. With separated folder, the function is neater and doesn't look cluttered rather using manual function. Rather than include the file into the code like PHP Native usually do. [1]

CHAPTER III

PROBLEM ANALYSIS

III.1 Definition of Framework Code Igniter

Code Igniter is one of PHP programming language framework. The main aim why developer using framework is because with framework developer can finish their web application faster than using PHP native. Code Igniter using MVC pattern, MVC is one of application design patterns that usually used by developer to make the works faster. Rather than using PHP native, Developer can use Code Igniter to finish their work faster than not use any framework. The MVC design pattern is such a good fit for web application development because they combine several technologies usually split into a set of layers. Also, MVC specific behavior could be to send specific views to different types of user-agents.

III.2 Code Igniter Controller Scope

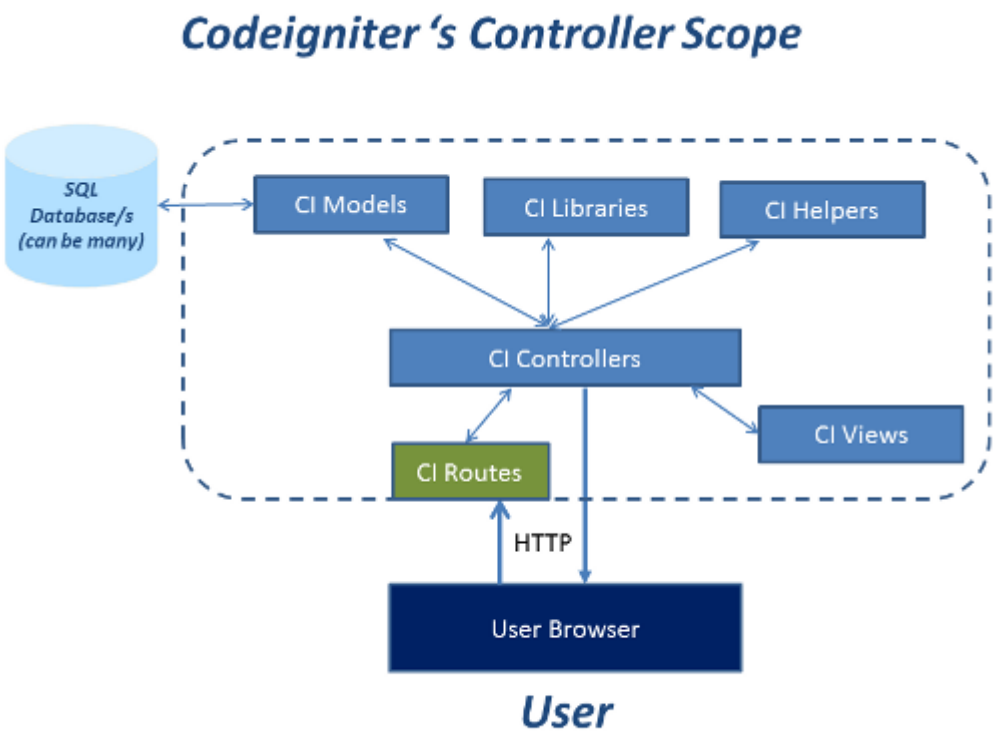

Figure 3.0 Code Igniter's Controller Scope

Source : www.packtub.com

Code Igniter has a complex building. That's the reason why the security level in the Code Igniter is better than using PHP Native. MVC Pattern connected with each other like the picture above. It show the Controller are the main processor of the program because Controller is the main function that display all of logical function. Without Controller, any libraries, model, and views can't be shown to the user. Several relationship will be describe below.

Description of each parts, there are :

1. Model

   Model is the part of the Code Igniter system that manages all query related to data. Model usually used to code the query of CRUD (Create Read Update Delete) from database. The Model is responsible of all query database application.

2. View

   View is the part of Code Igniter system that display the web. View used to display the template that created by Developer. It also display the code of query. As example we want to display product of today. Result of the code can be seen at View folder.

3. Controller

   Controller is the part of Code Igniter system that manage all of logical function related to Model and View. Controller being a bridge between Model and View, because Controller has a function to manage the code which show the result of logical function. Controller also be a place to process the algorithm to show the result at the view folder.

4. Libraries

   Libraries is the part of Code Igniter system that manage the libraries of application. The function of libraries in Code Igniter is same like libraries in Java. Libraries will help the application development. The example is when application need a template so the view of Code Igniter using dynamic template and doesn't need a lot of change in one view.

5. Helpers

   Helpers is the part of Code Igniter which has the function to help the developer develop the program. The Helper will transform the text into the format of Helper. As example the original format text of Date Time from database is 2016-02-11 24:10:23. The text can be changed into Tuesday, November 23 2016 12:10 PM. Also text of amount from database is 200000 we can change it into $2000,00.

Helpers is the great feature of Code Igniter that help development of text from database.

6. Routes

   Routes is the bridge of Code Igniter codes to help user display the link that requested. The Function as the bridge of application. If the link are not written in routes they can't display the link that requested by user.

7. SQL Database

   SQL Database are default database of Code Igniter. We can use MySQL as the default database of our program. SQL Database will stored any data that stored in the database. Most of Developer using MySQL as the default database when develop web application using Code Igniter.

8. User Browser

   User Browser are the display of the application. User can see the application through user browser. Every code that written in application will displayed at User Browser. User Browser also is the place of user interaction with the application such as requesting the data and store some information.

Relationship between each part, there are :

1. Model – SQL Database

   Model as the query function will call data appropriate the query code. As example, if the code are display the data. The database will bring the query request, that's data.

2. Controller – Libraries

   Controller as the logical function need libraries to make the program better. As example if we want use one template to some of template to make the program easy to code, we can using template library to make the template. The function of libraries is same like common libraries, to make developer easier when making the program with the help of library.

3. Controller – Helper

   Helper is a logical function that used by developer to make the code to use in some of views file. We can change the format date from 12//12/2016 into Tuesday, December 12 2016 with helper file. The objective is to be a template of code and developer can call it when needed. The perspective are same like Object Oriented Programming.

4. Controller – Routes – User Browser

Routes has a function as a bridge between the logical and user browser. Its mean the logical function that displayed to the user will going through a bridge called Routes. Routes also being a link of HTTP in user browser.

More complex about the architecture is when user want to see the web, they will input the address, after user input it will call the routes to check are the link is available at the controller. Controller will check the libraries and helper which needed in the view. Controller will call the libraries and helper, and also the model to get the data. Model will check data from query code that called by controller and return the data to the controller, after that the data will be displayed to the user via routes.

III.3 How to Use Code Igniter

There are simple steps to using Code Igniter, there are :

1. Turn on The XAMPP

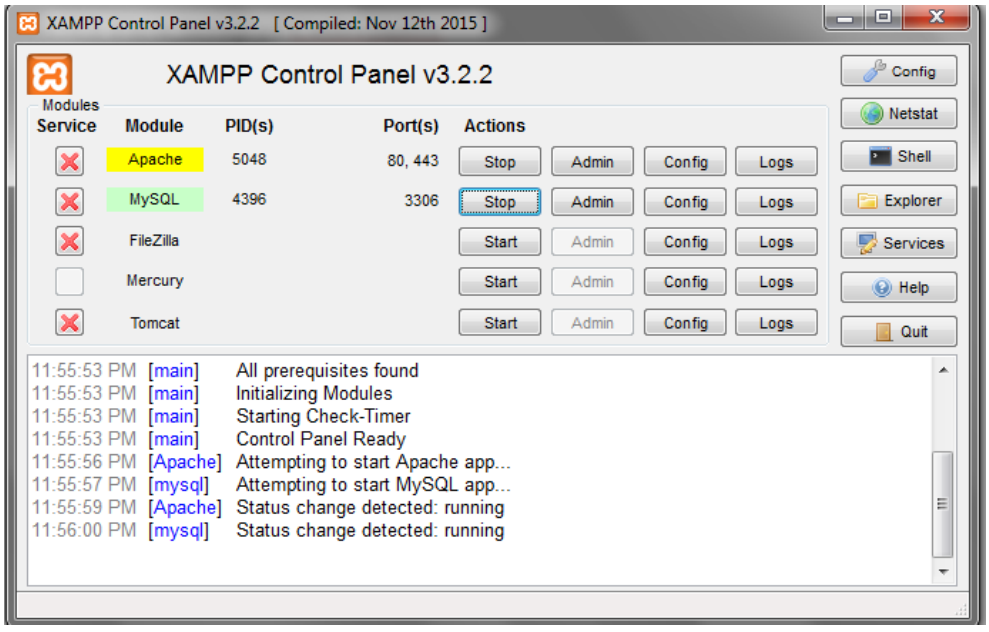

Figure 3.1 XAMPP Server

2. Make a folder of Code Igniter

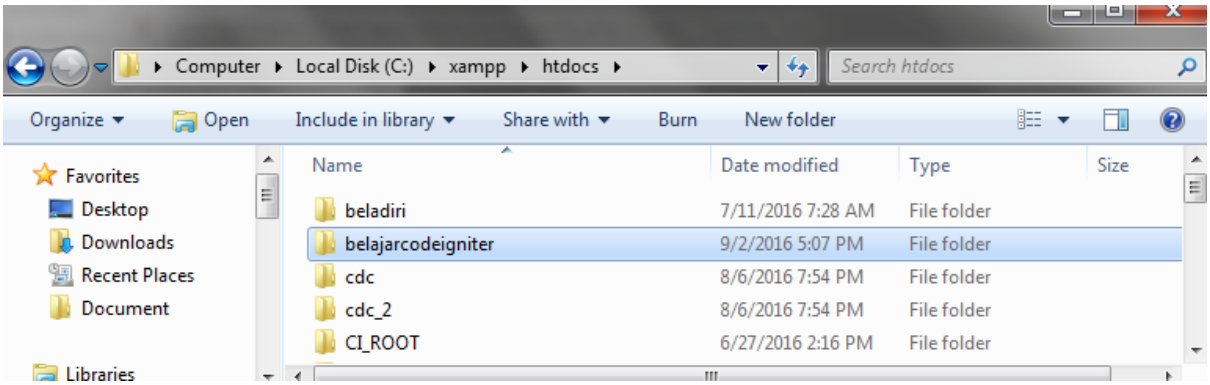

Figure 3.2 Folder of Application

3. Setting the base URL at Config.php

Figure 3.3 Setup of Config.php

4. Setup the database configuration

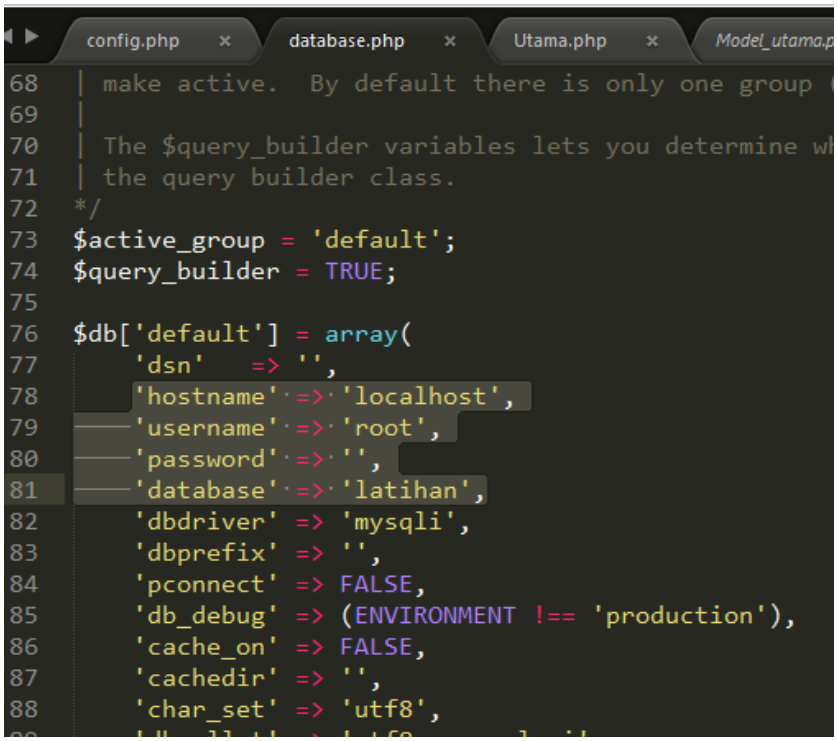

Figure 3.4 Setup of Database Configuration

5. Setup the routes to set the Main Controller

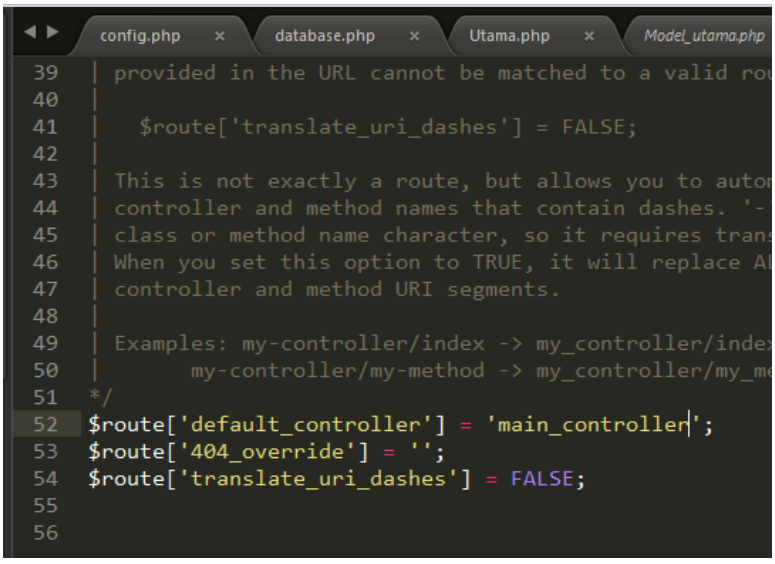

Figure 3.5 Routes Setup

6. Setup the model to get the data.

```php
<?php
defined('BASEPATH') OR exit('No direct script access allowed');

class main_model extends CI_Model {

    public function getData(){
        $q = "select * from data";
        return $this->db->query($q);
        }


    }
?>
```

Figure 3.6 Model Setup

7. Setup the Controller to make function to Index.

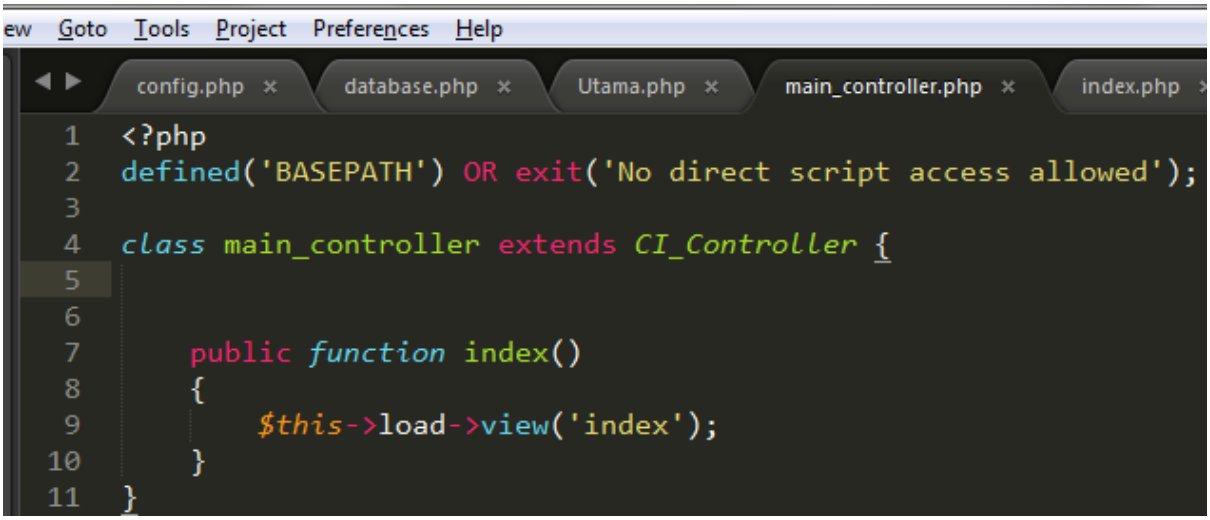

Figure 3.7 Controller Setup

8. Make index.php at view folder.

Figure 3.8 View of Index Page

9. Go to http://localhost/[yourbaseurl] and you can access your web application

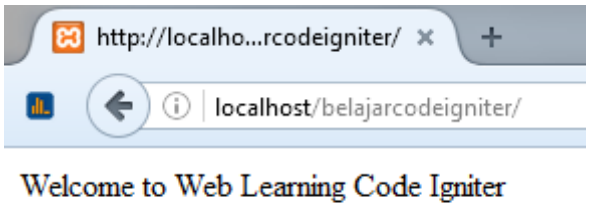

Figure 3.9 Index Page of Application

CHAPTER IV

CONCLUSION AND SUGGESTION

IV.1 Conclusion

Code Igniter is one of PHP Framework which used by Developer for making web application. Code Igniter using MVC Pattern that let developer work faster and easier. With MVC Pattern, the level security are better rather than using PHP Native.

IV.2 Suggestion

1. Choosing framework to making application is better than choose native method because faster and easier.
2. Choosing framework will make the security of program better rather than using native method.
3. MVC Pattern is good for programming because a lot of framework using MVC with their own style, its mean if people understand using MVC at Code Igniter, they can easily code in other programming language.

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