

## Table Tennis Tournament Scores and Statistics Web Application

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### Abstract

Table tennis is a popular sport that involves two or four players to hit a lightweight ball back and forth across a tennis table using small rackets. The scores are generated based on the tournament results. These scores were not digitized in the early days, therefore, the match referees had to record them manually while most of the competitors provided only basic information and real-time scores online. Over the years of technological advancements, the modern development of software applications has helped users perform useful tasks and retrieve useful data based on the requests. The objective of this project is to develop a functional web application that will retrieve or store table tennis tournament statistical data and visualize them using tables, bar charts, pie charts, histograms as a medium of demonstration for the user. Moreover, the application will perform specific analysis on the scores and display insightful data about the tournament for league structures investigation. The developed system will include a database to store and retrieve data for display on the user interface. The development of the project is fully stacked (front-end and back-end), so it is built with the appropriate web technologies to function in the background (PHP, MySQL, Apache) while displaying results (HTML, CSS, JavaScript) on the page for the user. The project is managed using effective project management methods to plan, design, implement, develop, and maintain the application.

**Keywords:** Table Tennis, Statistics, Web Application, Tournaments, Scores.

### 1. Introduction

The primary objective of this project is to develop a web-based application that provides statistical insights of table tennis tournaments scores by utilizing score values and converting them into useful data for the user. When users launch the application, the system will display tabulated data that are retrieved from the database. The application contains a built-in control panel for which administrators can log in and input tournament and match details such as their name, scores and the players who were involved. When browsing the application, there are several pages that perform specific functions. For instance, when

navigated to a “tournaments” page, the system will display all tournaments that are held in the current year and in the previous years. On the tabulated results being displayed, the user can click on available hyperlinks located in each row of data to be redirected to another page that will show detailed results of the tournament. The results will include the date for which it was held, the tournament’s name, the players involved and the scores of each match.

Every table tennis match consists of variables that can be considered as data [1]. The web application utilizes MySQL database to store them as records which then can be added, modified, or deleted. The system is dynamic so the data being displayed on the web application will be updated automatically. The application uses PHP to communicate with the database.

In this project, an opensource software called “phpMyAdmin” will be used to help create the database and its corresponding tables [2]. It will also allow developers to execute MySQL operations such as importing data into the database [3]. Fig. 1 shows a sample of phpMyAdmin interface.

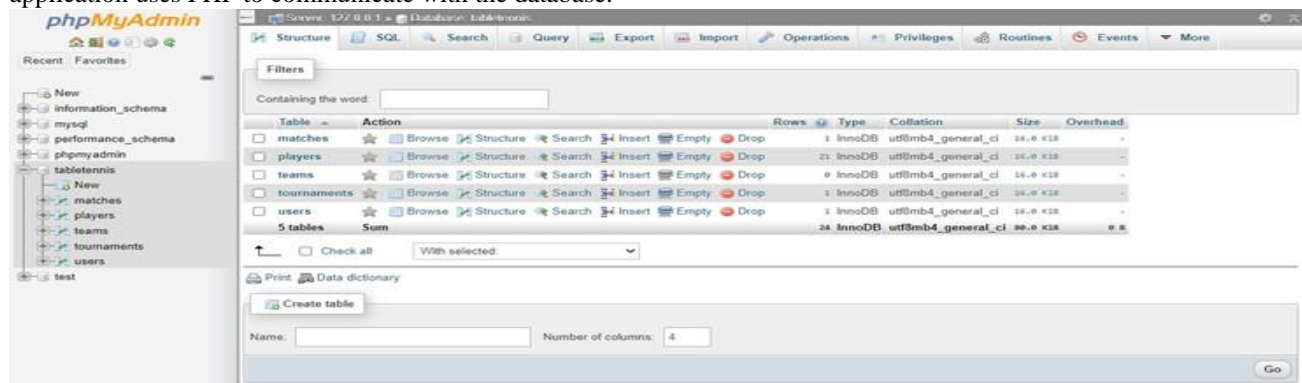


Fig. 1. phpMyAdmin Interface

HTML is used as a markup language to setup the layout of the web page and CSS was used for styling each web component of the page. By using a combination of these web technologies, a table can be created to display the

retrieved data to the user. While HTML and CSS are responsible for the front-end development, PHP facilitates in executing back-end operations by communicating with the database.



Fig. 2. XAMPP Control Panel

## 2. Methodology

The importance in the usage of methodology in this project is the identification of dependent and independent variables based on the requirement of the user and the system.

### 2.1. Developer Tools

For the ability to run the web application on a device (desktop/laptop), a software called “XAMPP” is utilized [4]. XAMPP is a free and open-source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, An additional tool that will aid in the programming process is the installation of an integrated development environment software. For this project, we will be using Visual Studio Code since it supports code auto-completion, proper indentation, and software debugging.

MySQL database, and interpreters for scripts written in the PHP and Perl programming languages [2]. XAMPP contains necessary packages and dependencies that will make the system operational. It consists of Apache which will be used as a web server. A web server is a computer that stores web server software and a website’s component files [5]. (for example, HTML documents, images, CSS stylesheets, and JavaScript files). A web server connects to the Internet and supports physical data interchange with other devices connected to the web. Fig. 2 shows a sample of XAMPP control panel that will allow the develop to activate the Apache server and MySQL database.

Visual Studio Code, like Visual Studio software, is essentially a text editor with pre-installed plugins to aid in application development [6]. Fig. 3 illustrates an example of how the IDE organizes code and indents them properly to aid developers.

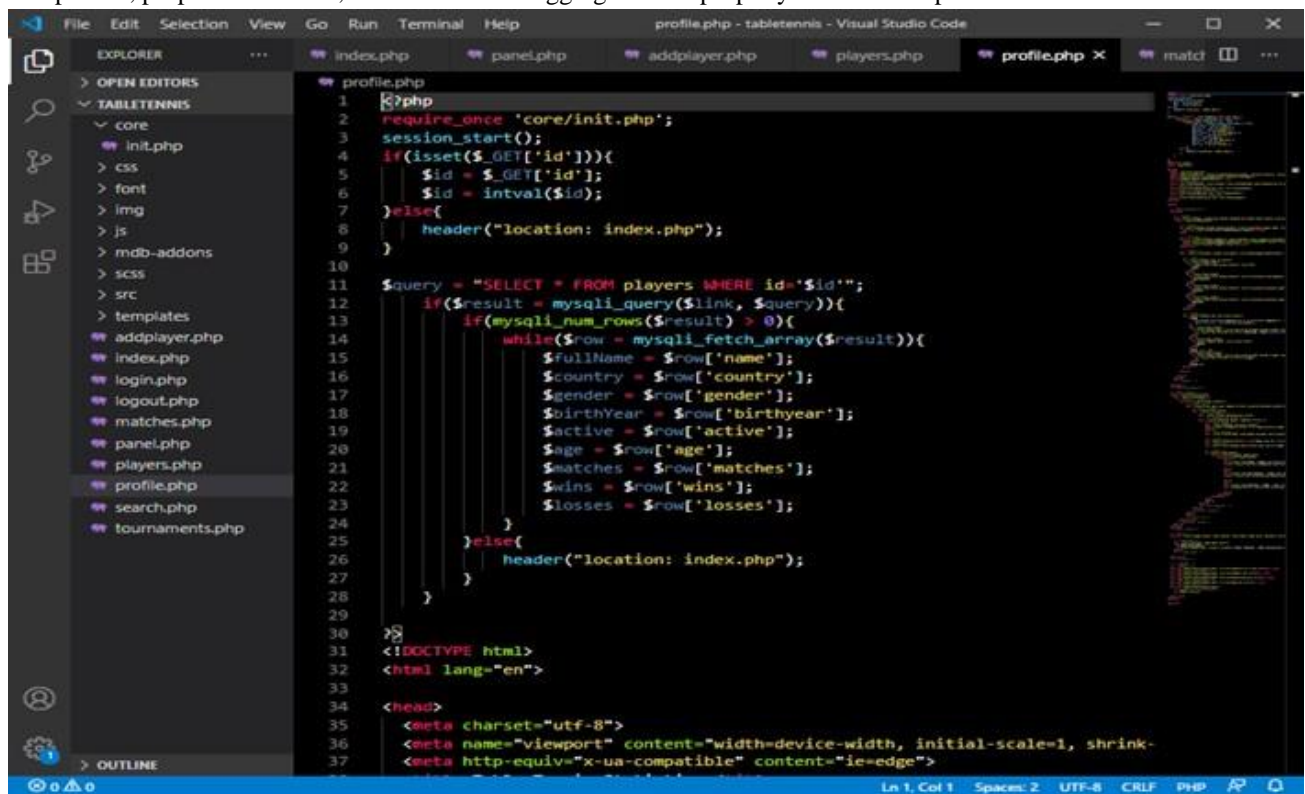


Fig. 3. Visual Studio Code Editor

## 2.2. Selected Development Methodology

The Agile Model of Systematic & Iterative Development was applied. The primary reason for selecting this approach is because of the complexity of the framework that will be developed. The process focuses on breadth rather than depth. We will not concentrate on the complexity of the feature because of the significance of providing few functional features that the user could

utilize until the initial version of the framework has been created. This will ensure that the system operations are designed so that users can use them [6]. There are 7 phases in the Incremental & Iterative Development Model, which include Planning, System Analysis, Design, Implementation, Application Testing, Assessment and Delivery [4]. Fig. 4 illustrates the title of each stage in the development.

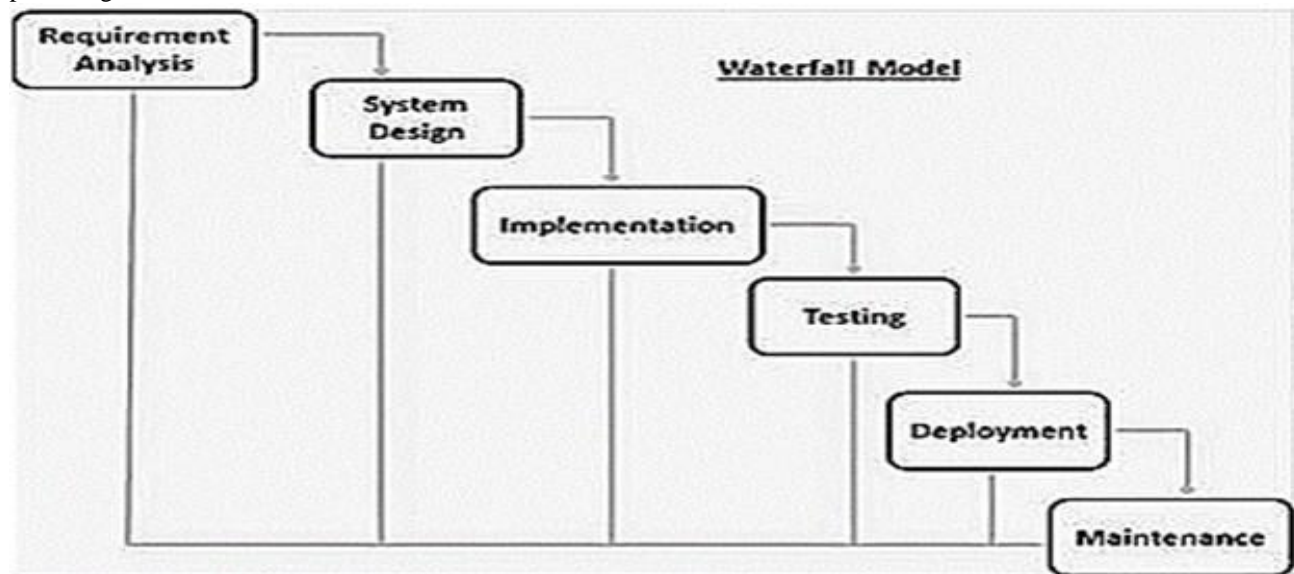


Fig. 4. Incremental & Iterative Development Stages

## 2.3. Selected Development Methodology

The general hardware requirements, microcapsules physical properties, and software specifications for both the user and the developer are tabulated in Table 1, Table 2, and Table 3 respectively.

Table 1. Basic hardware requirements

Component	Minimum Requirements
Processor	1.5GHz and above
Memory (RAM)	512MB
Hard-disk Space	5GB
Video Graphics Card	DirectX 9 and above
Screen Resolution	1024 x 768 or higher

Table 2. The process yield and physical properties of the microcapsules

Component	Minimum Requirements
Operating System	Windows XP/7/8/10
Web Browser	Chrome/Firefox
Server Software	Apache 2.x or above
Database Software	MySQL 5.0 or above
Integrated Development Environment	Visual Studio Code
PHP Editor	Visual Studio Code
Web Server	XAMPP

Table 3. User software requirements

Component	Minimum Requirements
Operating System	Windows XP/7/8/10
Web Browser	Chrome/Firefox

### 3. Results and Discussion

The following demonstrations were results obtained from the web application when launched by the user. As per depicted in Fig. 5, the web application home page includes the Id, name, Country name, number of winning cases and the last but not the least, information search has been provided to cover the in depth information of the athlete.

ID	Name	Country	Wins	Information
104799	KONG Linghui	CHINA	150	Q
117053	HAJKAL Rahman	MALAYSIA	70	Q
110262	XU Ke	CHINA	34	Q
101562	CHAI Kian Beng	MALAYSIA	32	Q
35	JIANG Jialiang	CHINA	19	Q
114104	CHEE Kien Ee	MALAYSIA	3	Q
107253	PENG Jia Ping	MALAYSIA	2	Q
108863	SONG Shichao	CHINA	1	Q
104526	KHOR Kok Seong	MALAYSIA	0	Q
109224	TAN Chee Seng	MALAYSIA	0	Q

Top 10 Male Players

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Fig. 5. Web Application Homepage

The homepage of the web application demonstrated in Fig. 5, displays basic statistics of the top 10 table tennis players of the year for both men and women separated into two tables. Each table will contain the unique identification number of the player for which can be used to retrieve their designated records from the database using PHP and MySQLv. Additionally, the name of the player described in the second column of the table. The table will also display the player's association as well as their total scores for the year. All data are sorted by the players' total scores in descending order. The table will also contain a final column which represents a magnifying glass that will redirect the user to a separate profile page which will describe the information of the player in detail when clicked.

An administrator can log into the system by using the login form as shown in Fig. 6. The form includes two input fields: username and password. Once the user enters their credentials, the web application will cross-check the details with the user records stored in the database. If the credentials are correct, the user will be redirected to the homepage where the navigation bar will display the full name of the user. If the input values are invalid, the application will display an error message to the user. Once logged in, the user can click on their full name located at the top right corner of the application and they will be redirected to the control panel. The control panel will allow the user to execute administrative operations such as adding, modifying, or deleting players.



This is applicable to table tennis matches and tournaments as well. The administrative operations are essentially handled at the back end where PHP will

validate the user's input and make changes to the database accordingly.

ID	Tournament	Year	Month	Matches
<a href="#">1003574</a>	2019 - ITTF Junior Circuit Golden Thailand Junior and Cadet Open, Bangkok (THA)	2019	January	168
<a href="#">1001169</a>	World Table Tennis Championships, London (ENG)	2019	April	412
<a href="#">1138462</a>	2018 - Latin American Championships, Havana (CUB)	2018	March	328
<a href="#">1413476</a>	2017 - European U21 Championships, Sochi (RUS)	2017	January	127
<a href="#">1002743</a>	2017 - ITTF Challenge Belarus Open, Minsk (BLR)	2017	October	229

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Fig. 6. Tournaments List Page

Fig. 6 is an illustration of the web application that will display a list of tournaments sorted in descending order by time (in years). For each row of data, the table contains a unique identification number for reference with the database followed by the name of the tournament being held. The user will be able to see the number of total matches that was held during the tournament which can be viewed in detail when the user clicks on the identification number. They will be redirected to a separate page that will list all matches and their details as shown in Fig. 8. When viewing the list of matches in a tabulated form, the user is expected to find the name of

players who were involved including the number of points each player has allocated. The total rounds displayed is calculated based on the total number of points collected by the match's corresponding players.

There is always a need for the exact information of the competition lists to have a better understanding and more reliable analysis in each tournament and hence, in this web app, the matches list page has been introduced in which, the tournament, players name and the result of the game has been stated clearly. This webpage is shown in Fig. 7.

TableTennis Stats Home Tournaments Players Matches <span>Login</span>						
« < > »						
Tournament	Player A	Player B	Rounds	Results A	Results B	Winner
2019 - ITTF Junior Circuit Golden Thailand Junior and Cadet Open, Bangkok (THA)	<a href="#">CHEN Qing (CHINA)</a>	<a href="#">FENG Jia Ping (MALAYSIA)</a>	3	1	2	CHEN Qing (CHINA)
2019 - ITTF Junior Circuit Golden Thailand Junior and Cadet Open, Bangkok (THA)	<a href="#">ANG Guat Huoy (MALAYSIA)</a>	<a href="#">HOU Xiaoxu (CHINA)</a>	4	3	1	ANG Guat Huoy (MALAYSIA)
2019 - ITTF Junior Circuit Golden Thailand Junior and Cadet Open, Bangkok (THA)	<a href="#">DING Ning (CHINA)</a>	<a href="#">KHOR Kok Seong (MALAYSIA)</a>	3	2	1	DING Ning (CHINA)

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Fig. 7. Matches List Page

To have a clear analysis on the athletes, the player profile page is also considered in this web page. The athlete's name, gender, age, number of wins and loses followed by the status of the player as either active or retired is determined.


TableTennis Stats	
 <p>ANG Guat Huoy Female   MALAYSIA</p> <p>Age: 40     Matches: 0</p> <p>Birthyear: 1980     ↑ Wins: 0 (%)</p> <p>Status: <span>Active</span>     ↓ Losses: 0 (%)</p>	
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Fig. 8. Player Profile Page

#### 4. Conclusion

This paper summarizes the development of a web application for managing and viewing table tennis

tournament scores and statistics. It is a demonstration of applying efficient methodologies to implement the system based on the user requirements as well setting up the developer's workspace for application development. Minimum specifications were stipulated to ensure that the system is optimal for development, implementation, and execution to the developer as well as the user. The objective of this paper was to map out the guidance for setting up a web server and install the necessary components to successfully run the software.

The application is usable in any device across several platforms and to promote responsiveness and flexibility, the application can also run on mobile devices with the ability to work in almost any web browser.

By running the web application, the user can view valuable statistical insights about table tennis tournament scores as well as view additional information about the players involved in matches that were held in those tournaments. Additionally, this paper also describes the other features that was built in the web application including the dedicated user control panel for executing administrative operations with the records stored in the database.

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## Authors Introduction

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