Online Test Taking Web App

Programmers User's guide

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1. Introduction

The documentation helps the user in navigating through the prototype web application (online test taking application). Before we get into the details where to discuss the instance variables, methods and classes. I would like to provide the aim of the application which is to test a test by a student and evaluate it by the instructor.

The source code of this project is written in Java using the Eclipse Neon IDE. Since it a web application, to meet the project specification and requirements, we have improvised the Jsp framework to build the web application. The project goes like using the Tomcat 8.0 server.

The user for instance a student does a login in the login page, as the credentials are true the page routes to the student home page where the student has an option to take a test or either view his previous test scores. Again, based on the username and the role the login page routes to either the student home page or the professor's page. As far the professors page is concerned, this and the above will be discussed more in detail in further pages under the appropriate topics.

Enterprise Application:

Enterprise application is commonly employed widely all across the industry and is used by many major companies which require a business logic application and a third party api.

These are typically used to integrate with the enterprise applications to assist the organization in solving problems and to be deployed across a variety of networks (Intranet, Internet and corporate network) while not compromising on security and administration management.

Proprietary Enterprise Application

Usually developed by the in house IT development team within the organization. An enterprise may outsource some or all of the development of the application and bring it back in house for deployment.

Application Service Providers

Is prevalent, designed by a third party application service provider and leased to the enterprise, as an on premise or hosted service.

Java vs .Net

There are many ways of developing, implementing and deploying a web application. One of the common frameworks used is Microsoft .Net framework.

The .NET Framework is a software platform that mainly runs on Microsoft Windows and works in a similar way to Java. Source-code is compiled to an intermediate language (known as Common Intermediate Language) which is then interpreted by a virtual machine. Just like Java, the client must have a runtime environment on his computer/device. The .NET framework is mainly intended to run on Windows. This offers advantages in terms of user interface consistency and performance, but might not be what a number of developers are looking for when looking for cross-platform software. There are other implementations available on Linux and Mac OS, but they have varying levels of completeness and there can occasionally be compatibility problems.

Whereas Java refers to a set of programs and standards. Source-code written in Java is not specific to any processor or operating system. It instead works by being compiled to an intermediate programming language called byte-code that engines on different operating systems (called virtual machines) can execute. A developer simply writes his program and distributes the byte-code. Virtual machines will be able to run it anywhere. The virtual machines also often take advantage of their respective operating systems libraries and offer the developer the possibility to give their application a good like and a better performance.

Adobe Flash

Adobe Flash is a multimedia platform that also allows developers to write rich internet applications. It has originally built to add animation, video and interactivity to web pages, but due to its extensive functionality, it is now also used to write more complex software. Flash can both embed itself in web pages and run directly from the web browser or Adobe's Flash Player. Because of its extensive set of features, Flash has enhanced considerably the functionality of web sites. It was not originally built to develop applications though and performance issues arise as soon as it has to perform computationally intensive tasks. It also lacks a number of libraries Java and .NET have to interact with the operating system.

Web Browser Applications

A web browser application (more commonly known as a web application) is a program that is accessed through a computer network using a web browser. It usually consists of two parts: a server component that provides and stores data for the user and a Client Component that is executed by the users as HTML.

Web applications have several advantages over applications written in the aforementioned platforms:

- Because web browsers are practically ubiquitous, web applications are considered to be one of the most expansive software platforms. Every modern desktop and laptop computer has a browser.
- Another key advantage is the ability to update and maintain web applications without having to distribute or install any software. The developer only has to update the content once on the server for all clients to get the updated version.
- Since all web browsers conform to similar standards, software running on them is essentially platform-agnostic.

PHP

PHP is a server-side scripting language designed primarily for web development but is also used as a general-purpose programming language.

PHP code may be embedded into HTML code, or it can be used in combination with various web template systems, web content management systems and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in the web server or as a Common Gateway Interface (CGI) executable. The web server combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the generated web page.

The original, only complete and most widely used PHP implementation is powered by the Zend Engine and known simply as PHP. The Zend Engine compiles PHP source code on-the-fly into an internal format that it can execute; thus it works a s an interpreter.

Hosting of web applications

Hosted Services: The first and simplest kind of hosting is creating a sub-website within a larger site, usually for a specific application like a blog using WordPress.com, Blogger.com etc. There are advantages and disadvantages to hosted services. They are simple to set up and get started with generally good speeds as the company is specialized and good at what they do. However, they have very little control over the technical side of things. Non-approved plugins are not supported.

Shared Hosting: You share a hosting server with thousands of other websites that are also stored on the same computer.

Application Hosting Using AWS: Amazon Web Services (AWS) delivers reliable, scalable, and cost-effective computing resources on which to host your applications. With the Software-as-a-Service (SaaS) model, businesses can consume applications that are hosted online, enabling them to lower their costs by paying only for what they use, enjoy seamless and painless upgrades in functionality, and integrate easily with their existing data and systems.

Virtual Private Server & Dedicated Servers: These are the top 2 levels of website hosting, and mean you get the whole server to yourself. The difference between Virtual Private Server (VPS) and Dedicated Server is that a Dedicated Server is

a single, physical system which you essentially rent inside of a data center. A VPS is a single, virtual machine – similar to the way you can use Parallels to run a virtual machine inside of your OSX install.

2. Abbreviations

UML – Unified Modelling Language

UX – User Experience Design

DB – data base

API – Application Program Interface

JSP – JavaServer Pages

HTML – Hyper Text Markup Language

3.Using the Software

In this section we outline the necessary software tools and components being employed to run the project.

The business logic and all the others instance classes are written in java using the eclipse ide. The web application and view components are being in accordance with the Jsp framework. You will notice this in the .xml and .jsp files in the project folder.

The project is hosted using the tomcat 8.0 server, with the tomcat server the user will be able to run the application and navigate through the pages.

The data based being used is the mysql workbench in which we execute our queries be in create, update or delete. All the data this which is being processed while using the web application will be available to view in the appropriate data base schema.

4.Web Application

4.1 Flowchart:

The following flowchart underlines the control flow of the project and gives an understanding to the user the way the application works or the way it should.

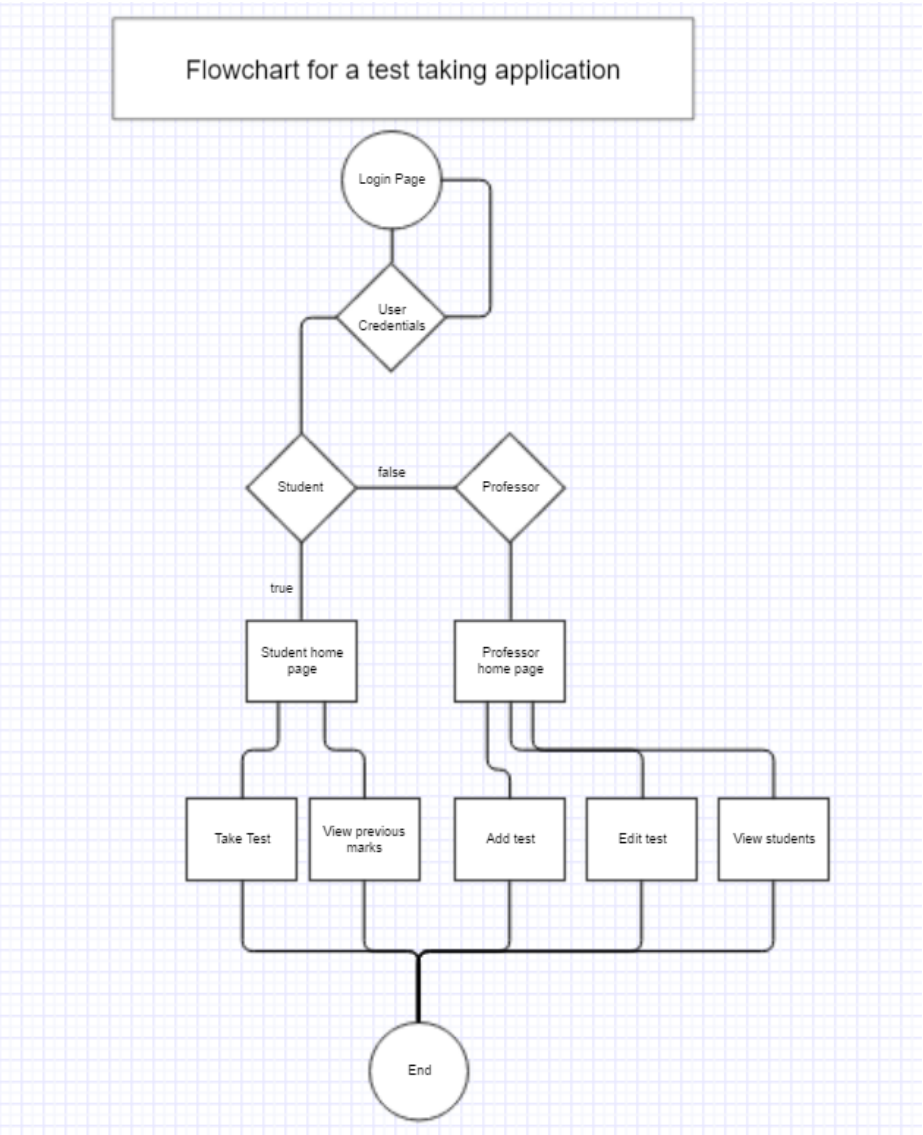

Fig4.1 The above flowchart sketches out the work flow of the project

4.2 UML Diagrams

The UML diagrams enclosed below are part of this project which describe the dynamic aspects of the system.

UML for all the classes and also the loginBean are outlined in this section.

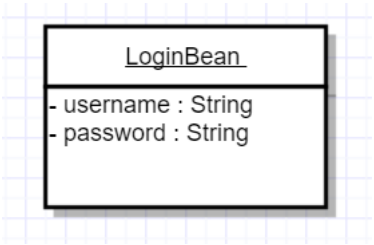

Fig 4.2.1 loginBean uml

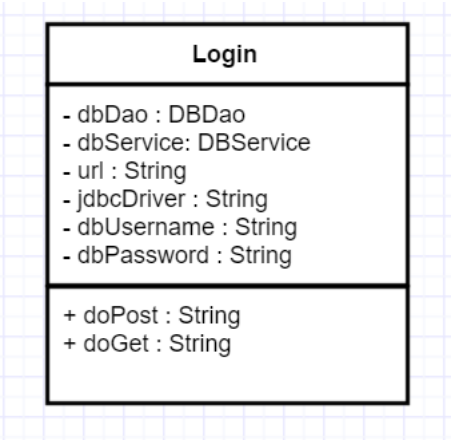

Fig 4.2.2 login class uml

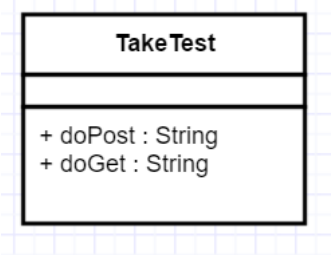

Fig 4.2.3 TakeTest class uml

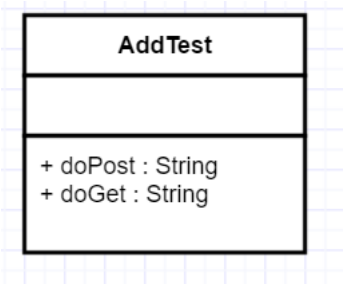

Fig 4.2.4 AddTest class uml

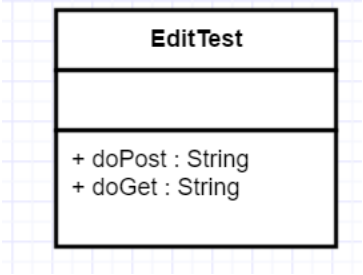

Fig 4.2.5 EditTest class uml

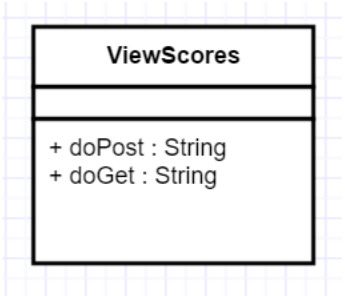

Fig 4.2.6 ViewScores class uml

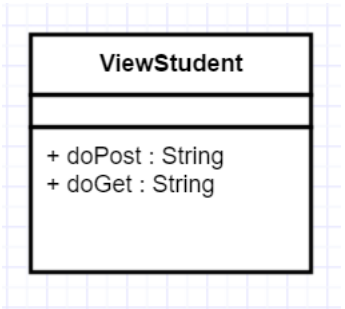

Fig 4.2.7 ViewStudent class uml

4.3 UML diagram for the DB Schema

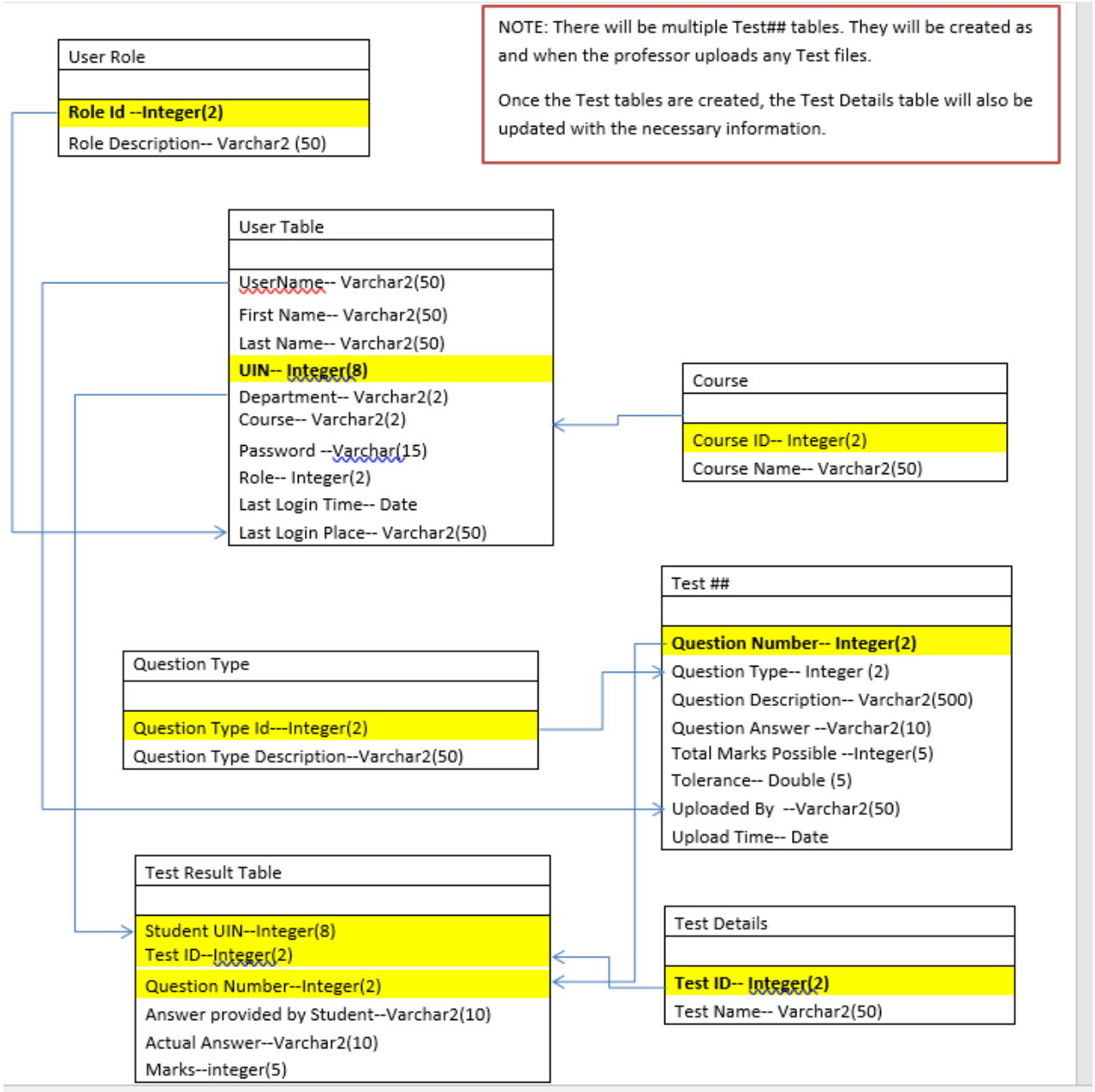

Fig 4.31 UML diagram for the data base schema

4.4 UX

In this section we have all the pages which navigate through all the pages of this web application.

The first page is the login page where the user either a student or an instructor can login from this page, and based on the role as in a student or an instructor the login page navigates to the student home or the professor home page.

In the student home which is in the fig 4.4.2, the student can either choose to take a test or view the previous test scores. And in case of the instructor, the instructor can either choose to add a test which again routes him to the take test page or he may view the students and this routes to the view student page.

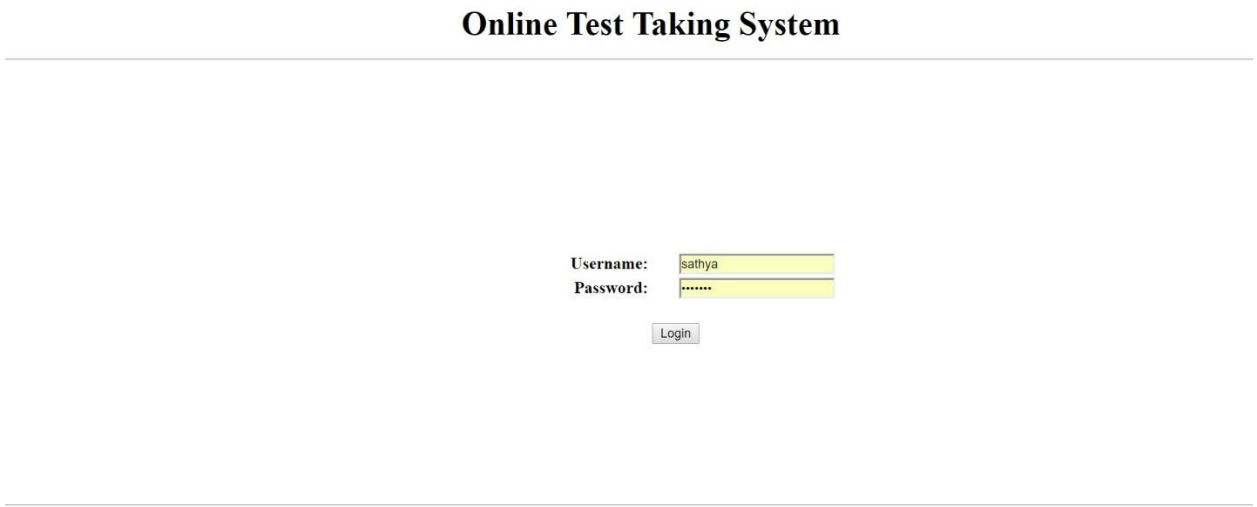

Fig 4.4.1 The above figure is the starting page which is the Login page

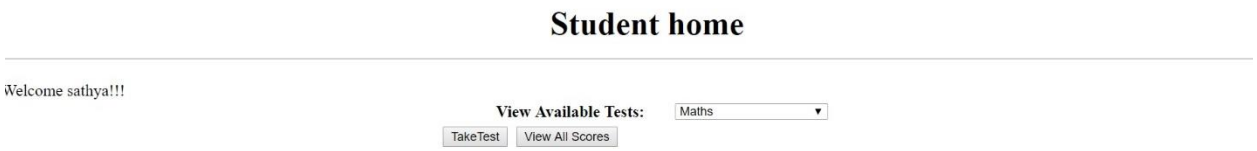

Fig 4.4.2 The above figure is the students home page

Fig 4.4.3 The above figure is the instructors home page

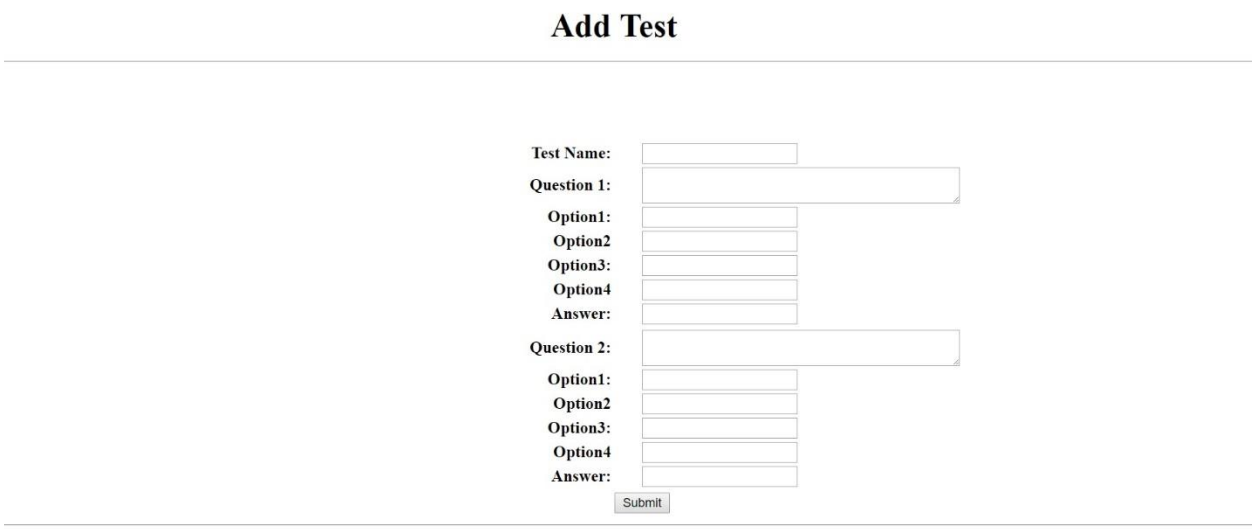

Fig 4.4. 4 Add test page

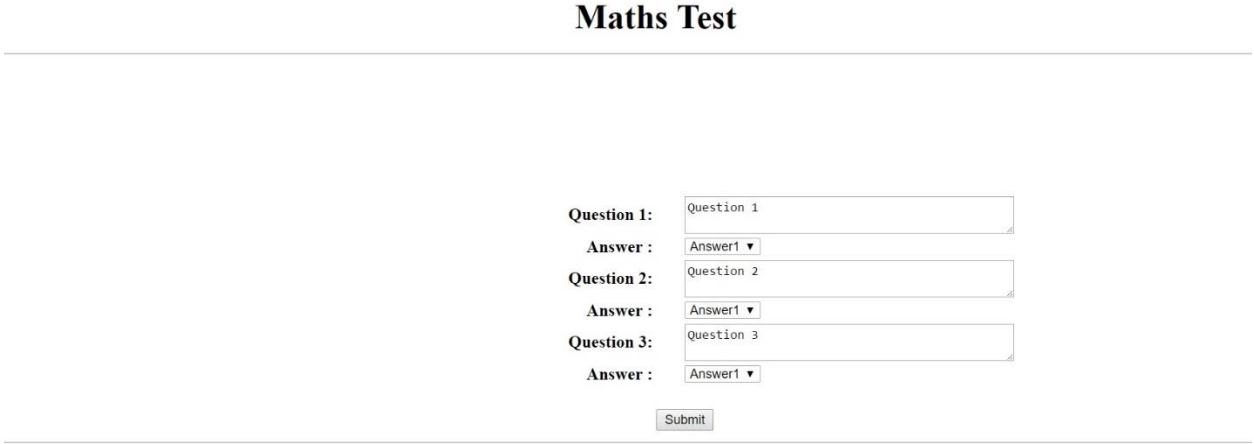

Fig 4.4.5 Maths test home page

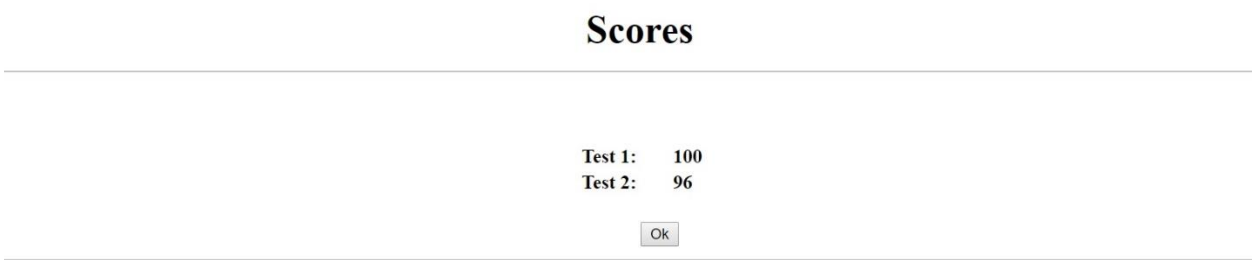

Fig 4.4.6 Scores home page

5. Software Library References

In this section we discuss about the dependencies and libraries employs to run the project.

All the libraries and references can be found in the resource folder where you will find library folder within which has all the libraries the project uses to run the system and successfully host it on the tomcat server.

References:

1. (Methodologies and Architecture for the Implementation of a Web Application, Retrieved Sep 29th 2016, from http://www.diva-portal.org/smash/get/diva2:618769/FULLTEXT01.pdf)
2. (Web Services: Distributed Applications without Limits - An Outline, Retrieved Sep 29th 2016, from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.94.1406&rep=rep1&type=pdf)
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