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## Virtual Lab Simulation

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**Abstract:** The educational process is incomplete without practical experience. However, many institutions lack the time and financial resources required to set up and develop research laboratories. A solution to this difficulty could be found in the adoption of Virtual Reality technology, which could allow the establishment of Virtual Laboratories that mimic the processes and behaviours that might occur in real laboratories. We propose a web-based system that allows users to conduct experiments in educational fields such as Web Designing multiuser worlds where users are represented by avatars and are provided with a wide range of communication and collaboration services in order to simulate a real learning experimental process as efficiently as possible. The educational industry has witnessed technological advancements involving computer-aided learning in the last few decades that promise to drastically change teaching and learning methods. The Worldwide Web has played a significant role in storing and disseminating information in the educational community. Conventional classroom-based instruction involves lectures delivered by a lecturer at a designated time and place. The lecturer faces constraints in terms of time and place as a result of the traditional classroom system. Due to the human factor arising from the traditional classroom system, the lecturer may not always be able to put in their best efforts toward preparing and delivering course materials.

The aim of the Virtual Classroom System is to overcome the disadvantages of traditional classroom interaction between students and faculty. The system replaces the manual system with an online Interactive Classroom using RMI.

### INTRODUCTION

The project aims to provide remote access to Laboratories in various disciplines of Science and Engineering for students at all levels from undergraduate to research. Students can learn at their own pace in virtual labs, which encourages them to perform experiments. Virtual Labs also offers a comprehensive learning management system that allows students to access a variety of learning resources, such as extra web resources, video lectures, animated demonstrations, and self-evaluation.

The purpose of this lab is to practice writing basic and advance web pages with HTML and CSS and uploading them to the Web. Demonstrate HTML elements and structure, the building blocks of websites, all the syntax you need to create tables in your HTML documents, about the inner workings of an HTML form with examples, link different HTML files, style and lay out web pages For this study secondary data has been collected. From the website of KSE the monthly stock prices for the sample firms are obtained from Jan 2010 to Dec 2014. And from the website of SBP the data for the macroeconomic variables are collected for the period of five years. The time series monthly data is collected on stock prices for sample firms and relative macroeconomic variables for the period of 5 years. The data collection period is ranging from January 2010 to Dec 2014. Monthly prices of KSE -100 Index is taken from yahoo finance.

Table 1  
Learning Objectives and Cognitive Level

Learning Objective	Cognitive Level	Action Verb
User will be able to: To explain the HTML tag for understanding webpage.	Understanding	Explain
User will be able to: To describe additional information of HTML tags to enhance the working of tags.	Understanding	Describe
User will be able to: To demonstrate a web page with help of different types of controls like textbox, labels	Apply	Demonstrate

#### PROBLEM DESCRIPTIONS

In Pandemic Widespread how instructors can associate with their students in real-time without any physical appearance with the coming of e-learning, inaccessible educating and learning through virtual lab stages and how users provide the ability to provide immediate response, as well as how users access resources and participate in ways they would not or could not in a traditional classroom.

Learning online may be isolating. There are thousands of MOOCs or independent learning program available that completely overlook one of the most fundamental aspects of gaining an education - meeting people. I recall engaging with and discussing with the great people I met along the road as the best part of my university days. Virtual classrooms rekindle the vital interaction between teacher and student, as well as student and student. Seeing everyone in the class, conversing with them in chat, or arguing with them in breakout rooms fosters a sense of community that only face-to-face encounters can provide.

#### PROPOSED ARCHITECTURE

1. Our simulator is divided in two half first part for user input and second part is for output screen for the user's input.
2. In the user part user able to doing both the character either he/she want to code or they can use button for selecting the tags for their uses.
3. In our coding part user start coding from basics to the end according to the HTML format.
4. In other part user are free to select different types of tags provided in the button that will see on the screen.
5. In the button part user are only to select the tag by using button and whole code will be appear in the screen and they want to copy or note that code according to their use.
6. But if the user want to write the code with self for their practice the can go on text file and start there coding according to their format of programing.
7. After completing the program user will go for run the program if the program will correct, the output will be shown on the second screen.
8. If they got an error the simulator will not show the output this only show the coding error.

Click on any button

Heading Tag

Break Tag

Strong Tag

Ordered List

Super Script Tag

Horizontal Row

Sub Script Tag

Emphasized Tag

Unordered List

Description List

Write your code here.

Run Code
Output

click **run code** to run your selected button.

---

Welcome to my page

Click on any button

## Result

The simulators of the virtual labs that were made earlier and whatever editors were available all are used some third party or the other to run the code, we improved this thing and we designed such a simulator in which the editor was installed without any third party and once the editor is full load on browser can use it offline too.

Click on any button

Heading Tag

Break Tag

Strong Tag

Ordered List

Super Script Tag

Horizontal Row

Sub Script Tag

Emphasized Tag

Unordered List

Description List

```

<html>
  <head>
    <title>Hello World</title>
  </head>
  <body>
    <!--Sample code -->
    <p>click <strong>run code</strong> to run your selected button.</p>
    <hr />
    <h1>This is Heading -1 </h1>
    <h2>This is Heading -1 </h2>
    <h3>This is Heading -1 </h3>
    <h4>This is Heading -1 </h4>
    <h5>This is Heading -1 </h5>
    <h6>This is Heading -1 </h6>
  </body>
</html>

```

Run Code
Output

click **run code** to run your selected button.

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This is Heading -1

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## Conclusions

Virtual Labs may efficiently give laboratory-like experiences to students who may not have access to genuine laboratory facilities or equipment, using only a broadband Internet connection and a basic web browser. While we are still in the early stages of the Virtual Labs Project's dissemination phase, a review of the workshops exit survey, as well as the comments received and enthusiasm displayed during the workshops, gives every indication that the workshops were a huge success and that faculty are eager to give virtual labs a chance to succeed.

## Future Scope

Presently Virtual Labs are now available for Computer Science courses. Virtual laboratories for Chemistry, Physics, Biotechnology, and Mechanical Engineering are being efforts are underway to developed, as well as virtual labs for vocational training.

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