Web Based Tuition Management System

A project by Nikita Singh

Roll no:D/19/cs/201

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NORTH EASTERN REGIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY

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1. Introduction

In this digital era, the speed at which digital revolution is happening is very encouraging, as it opens up new opportunities for everyone to grow in their respective field. With 504 million active internet users which is just 40% of India's population, it creates a great platform for everyone to come online and leverage the power of the internet.

Managing things offline with paper is challenging and error prone. Storing, accessing and modifying data becomes difficult. If the same thing is done online with data stored on a server, it becomes much easier to do all the things more efficiently. Here my goal is to build a tuition management system which is web based and can help students and tutors.

Web development is a specific field of software engineering that focuses on building web pages. Web pages, or web apps, are codebases that are downloaded and run in our web browser (e.g., Google Chrome) each time a user navigates to the website address.

This differs from other software which is usually downloaded once and runs as a standalone application on your computer or phone. Web development makes for an exciting career, as a web development cycle is usually much shorter and you get to iterate over your software at a much faster rate.

The major building blocks of the web are HTML, CSS, and JavaScript. We will be talking about all three languages. We can also think of web development as being split into two main categories: front end and back end. We will discuss what each entails.

2. Motivation

My parents are teachers by profession. They also run a coaching centre. I have closely observed the problems they face on a daily basis while carrying out their duties. This project tries to solve the problems they face and help them become more efficient and organized.

This project is web based as it helps them connect with more students easily and effectively. Being web based it can be used by anyone with an internet connection on their mobile devices. With this project my aim is to help both the students and teachers.

3. Objective

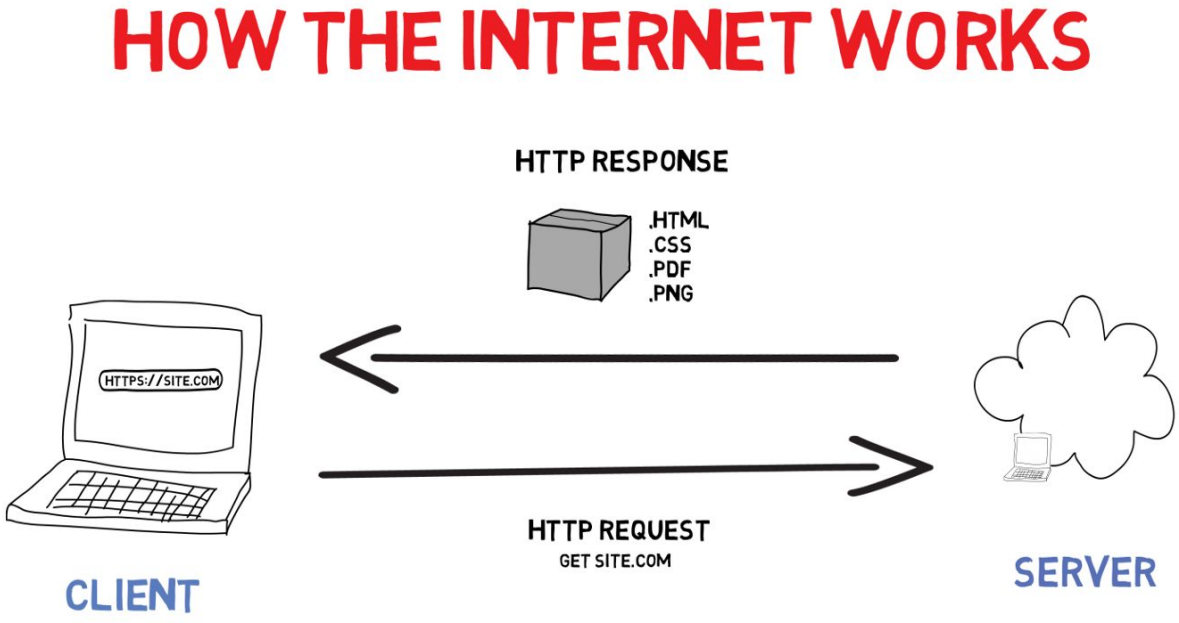
The objective of the project are as follows:

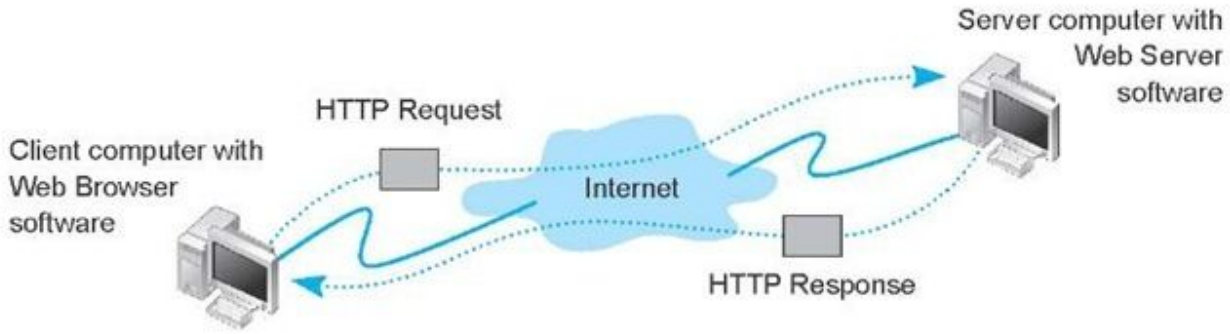
1. Build a website and publish it on the web where students can visit the website on the internet
2. Browse the courses offered by the tuition.
3. Check the faculty members and their details.
4. Register for the classes.
5. Login and download their routine and study materials.
6. Help tutor advertise to the students through the website.

4. Design and Architecture

We will be using the power of the internet to connect with students in real time.

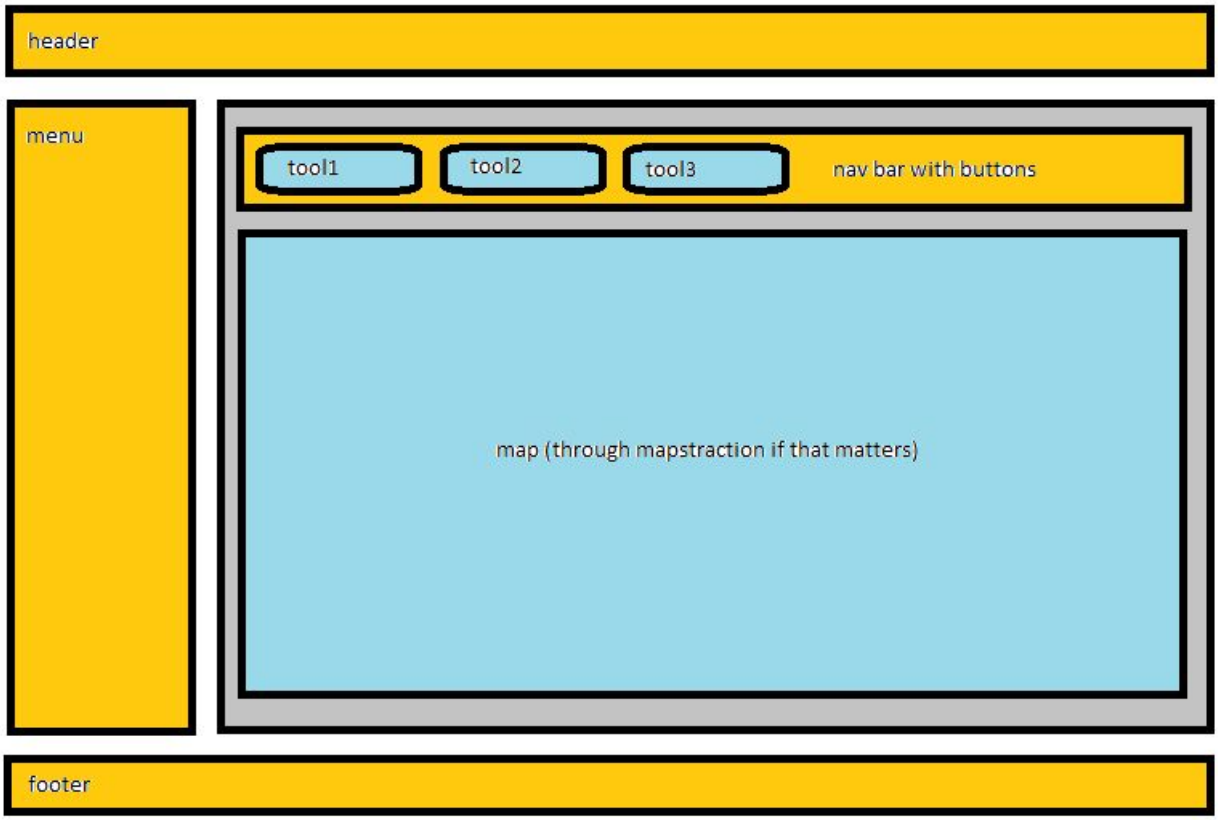
This is a basic diagram representation of how the internet works.



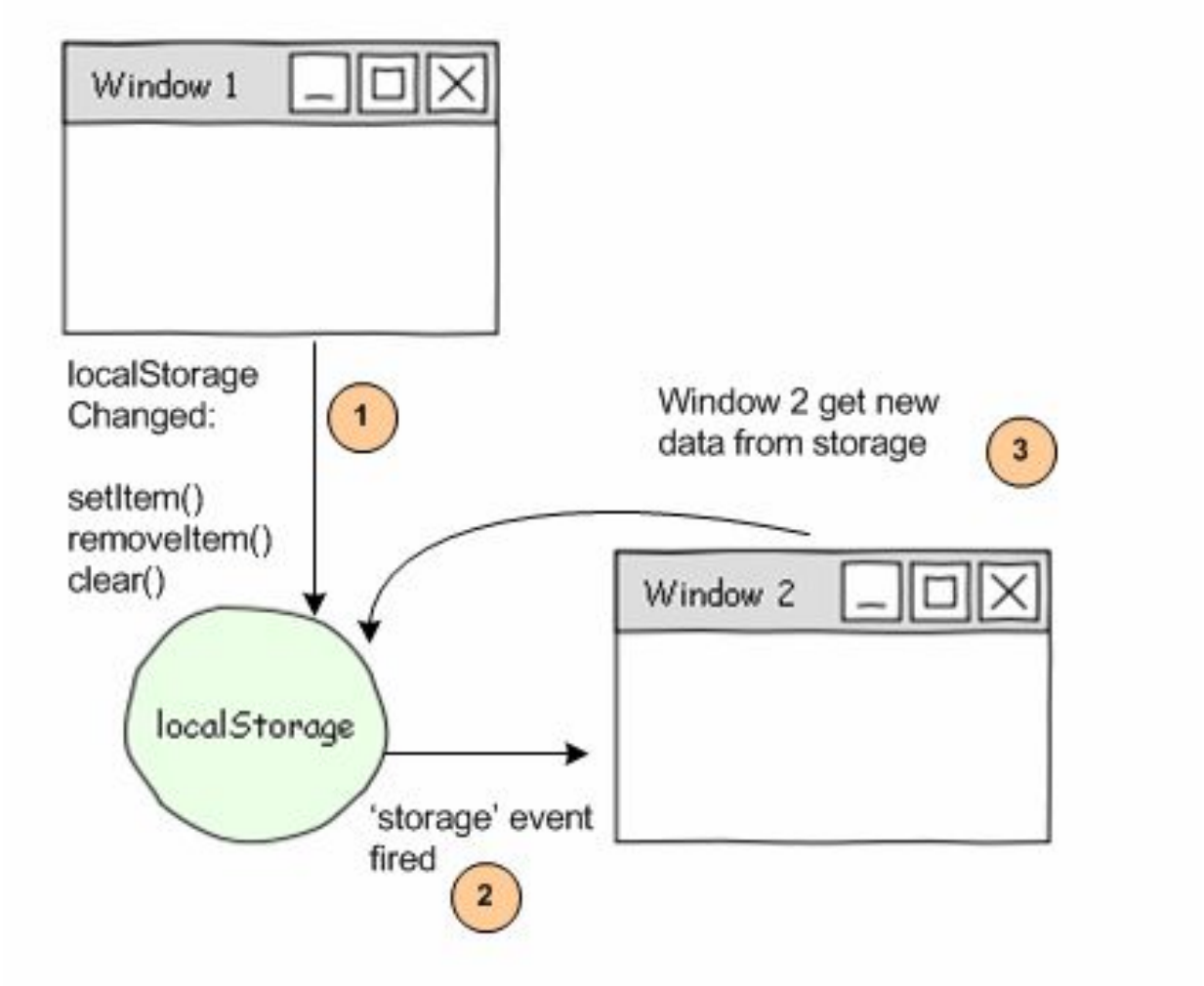


Here we have a client server communication taking place.

Client in our case the browser makes a request which is a HTTP GET Request to fetch the resources from the server which is our hosting purchased from godaddy. The server receives the HTTP Request and sends the HTML, CSS and Javascript files in response. The browser can use the files sent by the server and display them.



The structure of the website created using HTML and CSS.



We will use the browser's local storage object to store data.

Web storage objects localStorage and sessionStorage allow to save key/value pairs in the browser. What's interesting about them is that the data survives a page refresh (for sessionStorage) and even a full browser restart (for localStorage). We'll see that very soon.

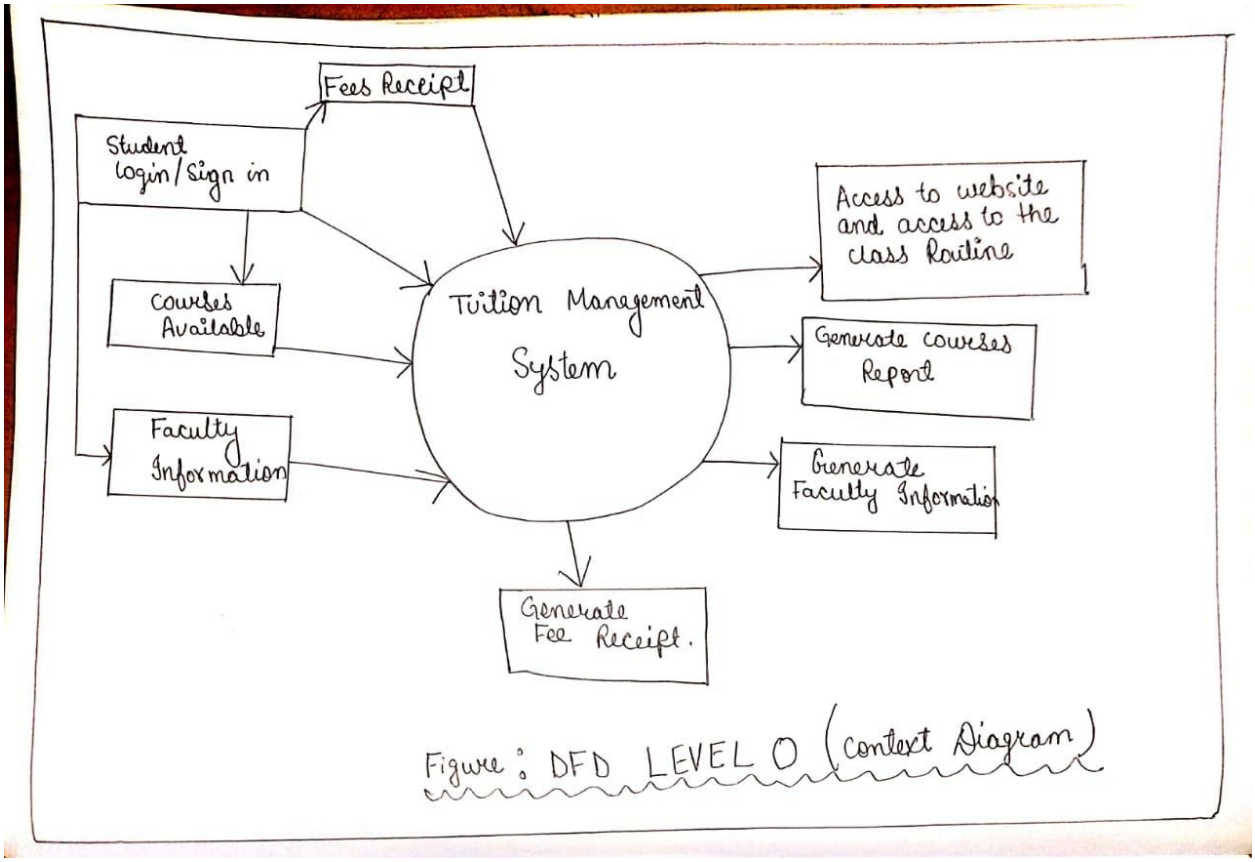
We already have cookies. Why additional objects?

- Unlike cookies, web storage objects are not sent to the server with each request. Because of that, we can store much more. Most browsers allow at least 2 megabytes of data (or more) and have settings to configure that.
- Also unlike cookies, the server can't manipulate storage objects via HTTP headers. Everything's done in JavaScript.
- The storage is bound to the origin (domain/protocol/port triplet). That is, different protocols or subdomains

5. Data Flow Diagram (DFD)

The data flow diagram represents the flow of data in a graphical format in a software architecture.

Understanding the data flow in the system is crucial for making the application performant.



6. Methodology

From the technical viewpoint there are three important aspects to this project. These aspects are being divided into phases below and the project implementation will be done in the same sequence.

The 3 phases are explained below.

Phase 1 (Creating the Structure)

Plan: This phase includes creating a basic website and having that website on some url which is accessible to everyone on the internet.

Action: Buy a domain from bluehost.in and link it to the code which will be hosted on a shared server.

Phase 2 (Creating Forms and Validation)

Plan: Here the aim is create a form with validation enabled that will act a registration form for a new student

Action: Create a form and validate all the inputs given by the students. (Reference 2)

Phase 3 (Storing and Displaying Data)

Plan: Storing the data of the user in the browser's local storage and fetching the data from it and displaying it on the website.

Action: Store data in localstorage object and show it to users (Reference 4)

7. Technologies To Be Used

1. HTML

HTML, or HyperText Markup Language in full, is a standard markup language for creating web pages. Contrary to common belief, HTML is not a programming language as it is incapable of performing logical operations. HTML is static, and is used specifically for defining the structure of a webpage. HTML uses tags to describe to the browser how data should be displayed

2. CSS

Cascading Style Sheets (CSS) is the language used to style HTML documents. As we saw in the view above, the styling is lacking in every sense. By embedding additional CSS, we can make stylistic changes to the webpage.

3. Javascript

With HTML and CSS alone, a webpage is completely static without any functional capabilities because HTML and CSS are exclusively responsible for the look. Unfortunately, this gets boring really quickly for the user since they are unable to interact with the webpage at all.

By embedding JavaScript in our HTML code, however, our webpage begins to have dynamic and interactive capabilities.

8. Software and Hardware Requirements

Sublime Text 3 - We need a text editor where we can write HTML, CSS and Javascript code. There are other options like Visual Studio Code by Microsoft but Sublime text is easy for begineers.

Browser - All the development work will be tested in the browser before moving the code to the server. I will Google Chrome as my testing environment.

Filezilla - To transfer files from the local computer to the web server using File Transfer Protocol.

Domain and Hosting - Will have a domain setup so that anyone can access the website and hosted in on a shared web server bought from godaddy.com

9. Project Planning

	A	B	C	D	E	F	G
			Project: Web Based Tution Management System				
		Weeks	Week1 /2	Week 3 / 4	Week 4 / 6	Week 7	Week 8
1		Learning and preparing Plan of Action					
2		Building the User Interface					
3		Making the forms and putting validation					
4		Storing form data and showing on the website					
6		Login for registered users					

The development process is divided in the phases described in the above sections.

1. Understand the problem and gather information about the best way to tackle it and then preparing a plan of action.

2. Building the basic user interface using HTML and CSS. HTML to give structure and CSS to apply styles.

3. Making the registration forms for the students to register for the classes and adding form validation as well.

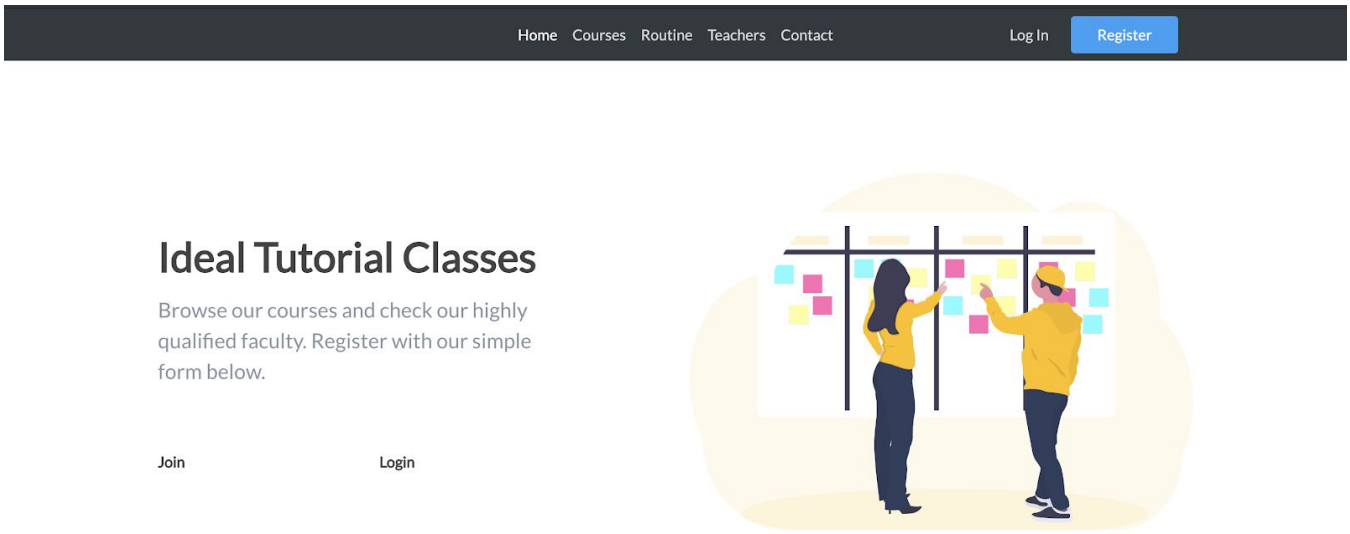
4. Storing the data provided by the students in the browser's localStorage database.

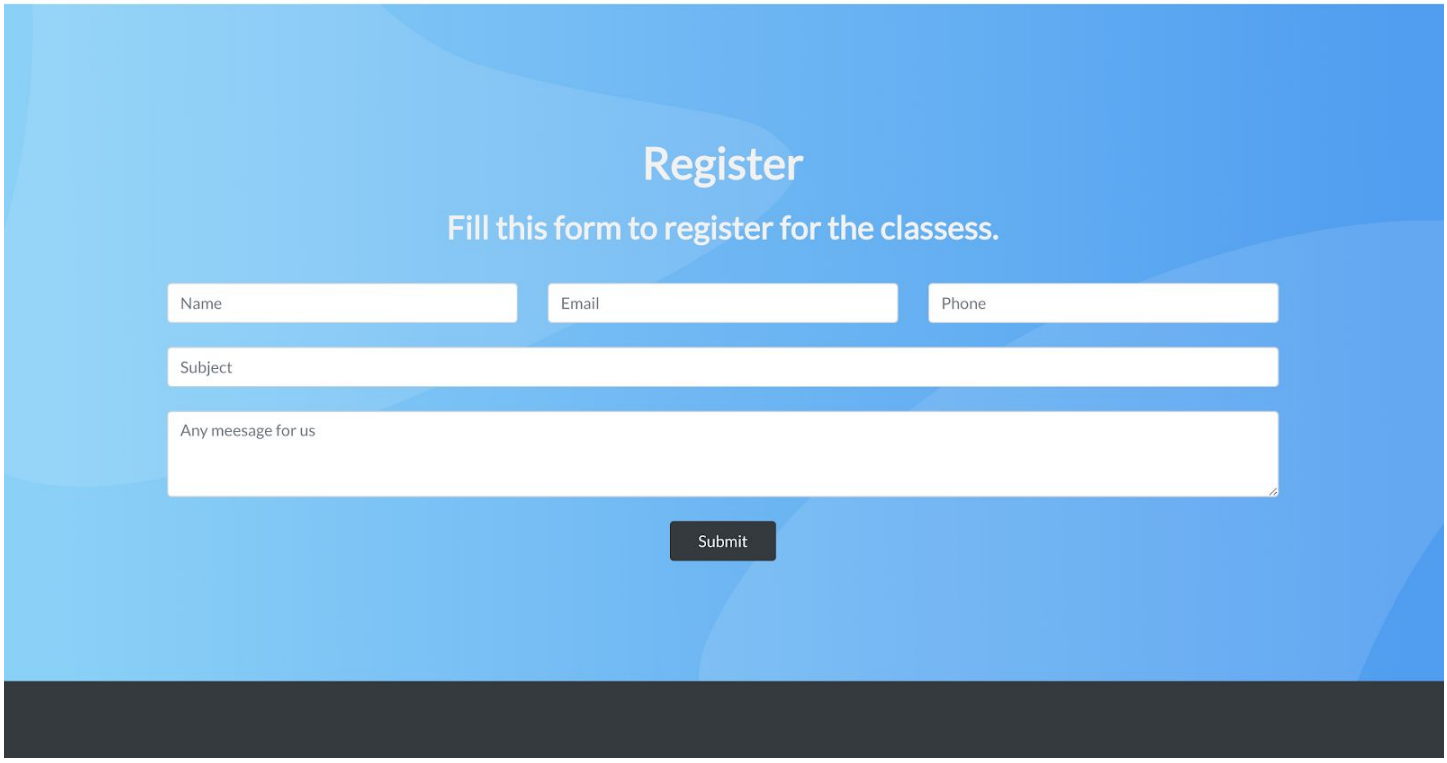
5. Allowing the registered users to login and see the routine and download study materials.

10. Development

```
index.html > html > body > header.bg-dark > div.container > nav.navbar.navbar-expand-md.no-gutters
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Web Based Tution Management System</title>
    <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.1.3/css/bootstrap.min.css" integrity="sha384-MCw98/SFnGE8fJ
    <link href="https://fonts.googleapis.com/css?family=Lato" rel="stylesheet">
    <link rel="stylesheet" href="https://use.fontawesome.com/releases/v5.3.1/css/all.css">
    <link type="text/css" rel="stylesheet" href="css/blocks.css">
    <link rel="stylesheet" href="css/main.css">
</head>
<body>
    <header class="bg-dark">
        <div class="container">
          <nav class="navbar navbar-expand-md no-gutters">
            <div class="col-3 text-left">
              <a href="#">
                <img src="./imgs/logo.png" height="30" alt="image">
              </a>
            </div>

            <button class="navbar-toggler" type="button" data-toggle="collapse" data-target=".navbar-collapse-4" aria-controls="navbarNav15
              <span class="navbar-toggler-icon"></span>
            </button>

            <div class="collapse navbar-collapse navbar-collapse-4 justify-content-center col-md-6" id="navbarNav15">
              <ul class="navbar-nav justify-content-center">
                <li class="nav-item active">
                  <a class="nav-link" href="#">Home <span class="sr-only">(current)</span></a>
                </li>
                <li class="nav-item">
                  <a class="nav-link" href="#">Courses</a>
                </li>
                <li class="nav-item">
                  <a class="nav-link" href="#">Routine</a>
                </li>
                <li class="nav-item">
                  <a class="nav-link" href="#">Teachers</a>
                </li>
                <li class="nav-item">
                  <a class="nav-link" href="#">Contact</a>
                </li>
              </ul>
            </div>

            <div class="collapse navbar-collapse navbar-collapse-4">
```

The development of the project is in progress. Below is the User Interface of the project.





11. Future Scope

There are some enhancements that can be done to this project which was not done in the current scope due to time limitations:

1. Making the website mobile friends with accessibility and semantics in mind.
2. Storing the data on the server instead of the browser
3. Adding security measures to stop data theft of students.
4. Allowing the students to pay fees online and maintain a record of it.

12. References:

Below are the list resources that was used to write this document:

5. https://timesofindia.indiatimes.com/business/india-business/for-the-first-time-india-has-more-rural-net-users-than-urban/articleshow/75566025.cms
6. https://www.w3schools.com/howto/howto_css_signup_form.asp
7. https://www.w3schools.com/howto/howto_css_example_website.asp
8. https://blog.logrocket.com/the-complete-guide-to-using-localstorage-in-javascript-apps-ba44edb53a36/
9. https://computer.howstuffworks.com/internet/basics/internet.htm