

**DESIGN AND DEVELOPMENT OF AN WEB BASED APPLICATION FOR  
ONLINE HOME TUTOR**

**BY**

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This Report Presented in Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science in Computer Science and Engineering

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**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADES**

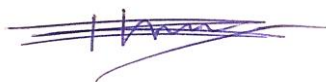
**AUGUST 2021**

## **APPROVAL**

This Project titled “**Online Home Tutor**”, submitted by Md. Al - Amin to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 18-August-2021.

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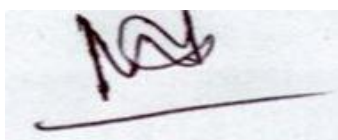
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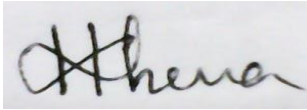
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## DECLARATION

We hereby declare that, this project has been done by us under the supervision of Ms. **Afsara Tasneem Misha, Lecturer of CSE Department**, and Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

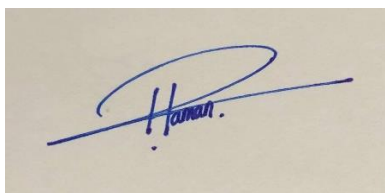
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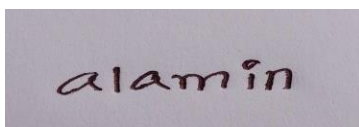
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First of all Thanks to the Almighty Allah because without his grace, kindness and mercy we wouldn't be able to full fill our little dream, also may Allah's peace be with his Nobel Prophet Muhammad (SAW). Then the most important thing that we can't justify with some words is the endless hard work and blessing of our parents.

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We are also thankful to our Co-Supervisor **Mr. Asif Uz Zaman Asif, Lectruer, Department of CSE Daffodil International University**.

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## **ABSTRACT**

This "Online Home Tutor" web-based application was originally created to provide assistance in emergencies. Here we are mainly focused on helping students who live in remote areas of the country. The main goal of this application is to create a connecting point for the best teachers in the country with students from any remote part of the country. In the education system of Bangladesh, going to school and college is not enough. Every student has to take a separate private teacher for each subject, even outside of school or college. This is relatively easy for students located in the city. However, there are many villages in Bangladesh where good teachers are still not available. So the students of that remote village lag far behind in terms of education. This application will give those students the opportunity to learn from the best teachers in the country while sitting at home. Students from the best universities in the country will be involved as teachers in this application. Therefore, school-college students from villages in any part of the country will get up-to-date directions while sitting at home. This means that the main goal of this "online home tutor" application is to make the learning process of students in any remote part of the country less complicated. Which will increase the mental strength of the students and help them to make the right decision.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

“Online Home Tutor” With the help of this application, students in remote areas will be able to receive high quality education at home. The boys and girls of the villages who go to school and college are far behind in terms of education. Lack of proper guidance and lack of good teachers they lag behind from childhood. With the help of this application, every student in the country will get timely and accurate guidelines and will be able to learn at home from the best teachers in the country. Students will be able to learn everything they need just by registering and logging in.

### 1.2 Motivation

Bangladesh has a large number of students. In the education system of Bangladesh, going to school or college is not enough, so students are forced to study privately. Science students and almost all students go far and wide in search of a good teacher. This results in loss of time and energy of the students and the output is not good. If there was a system that would allow students not to go to their teachers' homes and read the same lessons at home instead of privately. This is much better. With the help of this application, any student from any part of the country will be able to read privately from the best teachers of the country while sitting at home.

### 1.3 Objectives

- The difficulty of students' travel will be removed
- Students in remote areas will not be left behind
- Opportunity to learn from the best teachers in the country

In the 20's we realize that using technology has made our daily work much easier. But after a few years everything around us will be technology dependent. Radical changes will come in the process of teaching and learning. With the help of technology, teachers will teach in their own homes and students will learn in their own homes. This will save students time and energy.

## 1.4 Expected Outcome

- Students will be able to know and learn from the teachers of their choice sitting anywhere in Bangladesh.
- You don't have to go far to find a good teacher.
- If you don't understand a topic at once, you have the opportunity to understand it by watching the recorded video again and again.
- Make user less stress in a panicking situation.
- Immediate solution to any problem.
- Networking will be created with students from different districts.

## 1.5 Report Layout

### Chapter 1: Introduction

Why we created this application and the benefits of using this application have been described. Here's a discussion of why I usually thought of developing this app

### Chapter 2: Background

Here I have done the grounding of the application. Mainly this section will refer to the process of my thinking. And who will support user needs and security.

### Chapter 3: Requirement Specification

This section indicates what we need build the application. Here we have specified our primary need to build the application. We have worked on various models to develop the application in this section.

### Chapter 4: Design Specification

Here at first we made a blue print of the whole application how it will appear to the user. Way of appearance to the application to the user need to be specified in this section.

### Chapter 5: Implementation and Testing

In this section shows outcome of our hard work and also how the application is working. Here we will justify our apps eligibility.

### Chapter6: Conclusion and Future Scope

Here we have focused on future planning. How we want to work and update our application. In this section we will discuss how far we want to go with the application.

## **Chapter 2**

### **BACKGROUND**

#### **2.1 Introduction**

The online home tutor app is an effective and necessary application in any emergency situation. It is a groundbreaking application for learning from the best teachers in the country in a short period of time and anywhere in the country. With the help of this application, students will be able to take education from any teacher of their choice. Choosing a good quality teacher for yourself is time consuming and in some cases impossible because good teachers are not yet available in different rural areas of the country so through this application students can learn from any teacher from any part of the country. If students register for this application, they will be able to see the details of all the teachers and their course modules.

#### **2.2 Related Works**

The user of this application will be able to give a direct message to the teacher and if there is any problem, he will be able to give a message in the forum. We have made sure that the application is user friendly. We have created a high quality database in the application. We are using a real-time database and we are collecting a variety of information to find out what students need most in any crisis situation.

#### **2.3 Comparative Studies**

Online Home Tutor This application is not like any other online training center. Here we do not train students on any subject, we do not have real-time classes of different subject based subjects in school and college or university. In this application students will be able to take the classes they need and message any problem to the teacher and upload the problems to our forum. Students who are out of town travel mile after mile every day in search of a good teacher. This is wasting both energy and time of the students. With the help of this application, students can learn from the best teachers of the country of their choice at home and get the right direction from them and solve any problem from them.

#### **2.4 Scope of the Problem**

- Students can view the profile of any teacher
- Students will be able to add its details to the database
- Admin can give access to for doing any course
- They will have the option to find the information they need

- Students will be serviced on our server 24 hours a day
- You can message us directly
- Students can leave a message in our forum
- You can contact our hotline

## 2.5 Challenges

It is not possible to reach the goal without any challenge. Reaching the goal without hindrance is not satisfactory. The challenge makes the goal huge. We have repeatedly encountered various problems in completing our application. And we've been able to solve most of the problems. Students were able to login to this application to see the details of their favorite teachers and to see the course modules and to enroll in the course of the teacher of their choice. This was the most difficult challenge to overcome.

Users of this application will not be provided with all documents. Only users will be able to see the contents of the cells in which they will enroll. So we have to check so that a user does not get all the class documents in any way.

We are storing all the information of students and teachers in the database. So we need to check the security of the database. It is very important to ensure that no one's security is compromised through our application. So we need to take the necessary steps to strengthen the security of the application. We need to keep a close eye on the safety of our users.

This application will be simultaneously attended by students from the city and students from remote villages. So we need to have a very fast server. A high-speed server is required to provide 24-hour service so that students in remote areas can use this application very easily in times of crisis. And we need to make a user friendly application. So that students of any class can learn from this application without any problem.

Here some major challenges are given below-

- Create one strong database
- Provide high security
- Create market value
- Achieve publicity
- Whole application maintenance
- Modify user profile in database
- Giving admin all kinds of powers in database.

# CHAPTER 3

## REQUIREMENT SPECIFICATION

### 3.1 Business Process Modeling

If we want create any project first we have to build a business processing model.

Through business process modeling we can understand how the application will run by step by step. Business process modeling is given below.

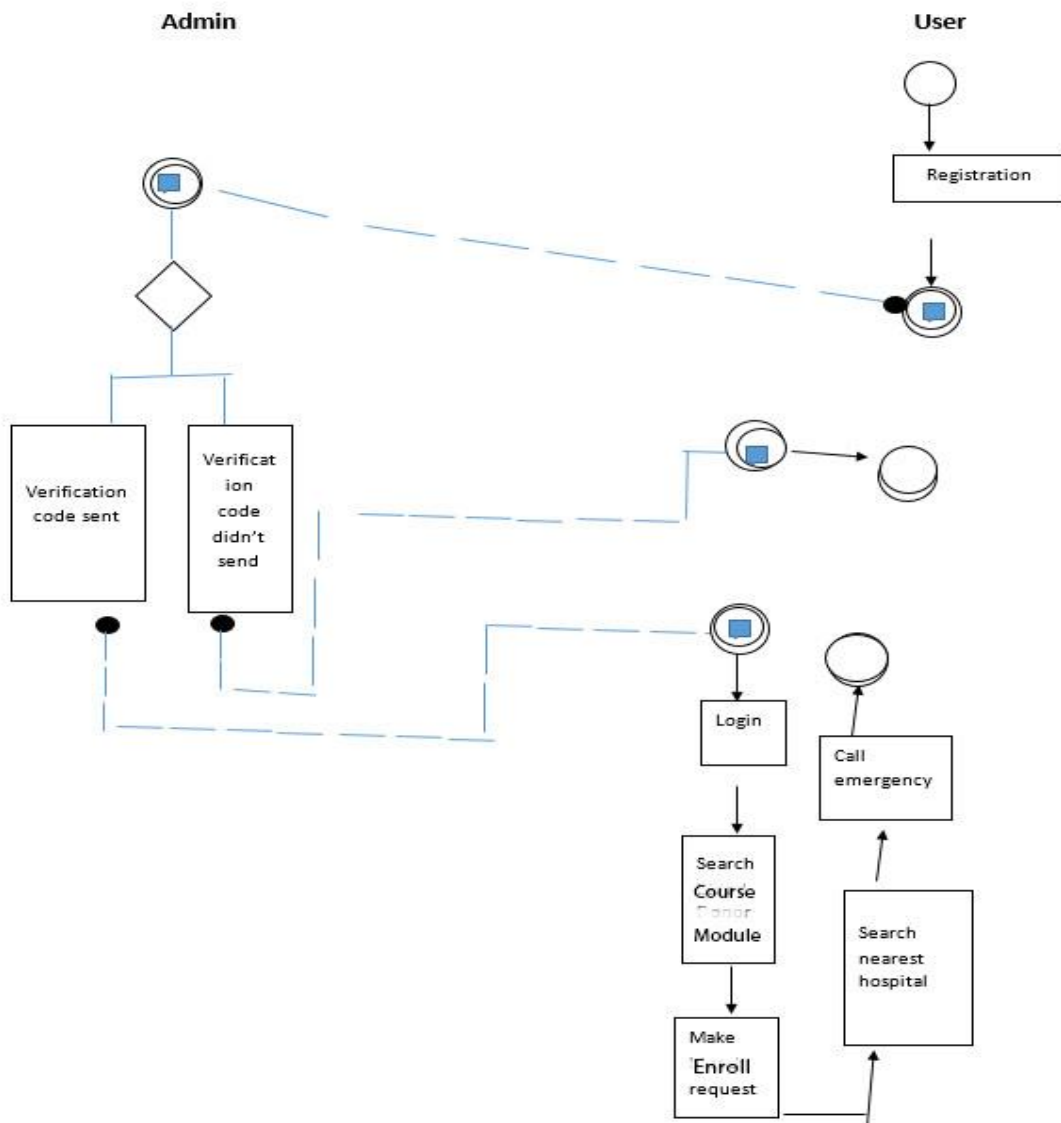


Figure 3.1: Business Process Model of Online Home Tutor

### **3.2 Requirement Collection & Analysis**

We had to collect and analyze different types of data to create a comprehensive application so that students could get good quality content. We've built the app in such a way that all types of users can benefit from using it. If people can't meet their basic needs by using our application then they will not use this application.

- The user can register all his information in the database.
- This database will have a direct connection to the system's database.
- The user must be logged in to use the application.
- If a new user wants to use this application, he or she must sign up.
- The user will be able to see the course modules and educational qualifications of each teacher.
- Only the admin will have access to the main database.
- Access to any third party database requires administrator approval

### **3.3 Use Case Modeling and Description**

Use case is a diagram that explains how a system builds relationships with different actors. We express these functions of the system by use case.

Use case diagram the key elements is actors. We have to use some sign to draw use case diagram. "Actor" Anyone who will play a role is called an actor. "Use case" Capability of system. "Connector" interaction between user and use case.

Use case model is an analyzing technique how user will interact with the system. Use case mainly shows the relationship between user and different use case user.



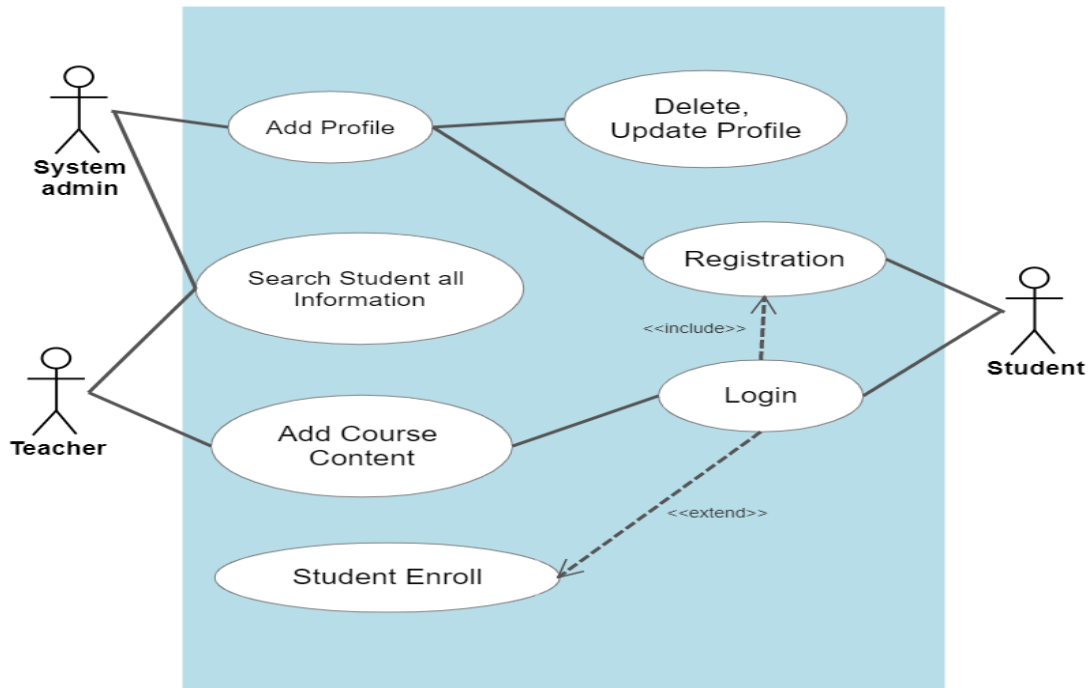


Figure 3.2: Use Case Model of Online Home Tutor

### 3.4 Logical Data Model

Logic model refers how the applications logic will work.

ERD Logical Data Model: ONLINE ORDER SYSTEM

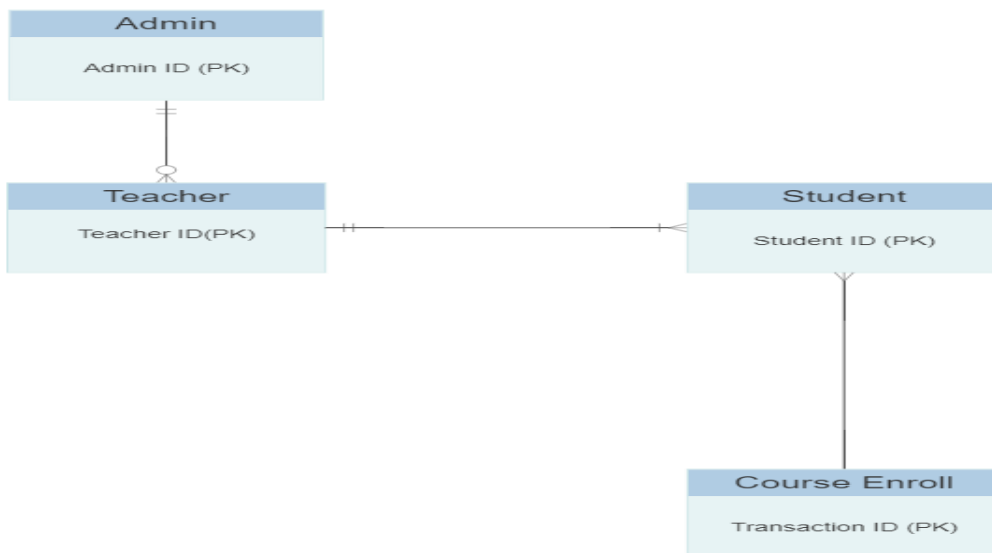


Figure 3.3: Logical Data Model of Online Home Tutor

### **3.5 Design Requirements**

- This application will consist of three types of user the admin, teacher and student.
- Admin can add new member.
- Admin can Update and Delete profile.
- All user create account.
- Student see all teacher's profile.
- Students can post in the forum to solve any problem.

## **CHAPTER 4**

### **DESIGN SPECIFICATION**

Here we will discuss about what our work will be to design a user friendly layout. Here we will talk about designing our thought visually.

#### **4.1 Front-End Design**

Front-end design is very important for any application because with this Front-end design the user will use this application or will be annoyed. Because Front-end design is an important means of communication with the user. The front end is basically a client site area. The front-end design of any application should be done in such a way that the client can easily understand all the functions of this server by looking at this front-end design. The front-end design must be user friendly. Because if a user comes to use this application for the first time and if the user does not find this application annoying or incomprehensible then he will not want to use this application. The front-end contains the entire layout of the application. Such as images, buttons, input fields, search queries, tables, etc. Collects data from all users through front-end user interactions. And he provides the data in the database. And the database saves that data. And returns a backup data to the user. That is a user interface. Front design is really important. If we can create a design that is accessible to all and easily understood by all, then it is a well-organized design.

- Registration Page.
- Login Page.
- Home Page.
- Blog Page.
- Free Tutorial Page.
- Teacher Information Page.
- Student Page.
- All Course Page.
- Contact Page.

## **4.2 Back-End Design**

When a system is running, that system has to deal with a lot of data. And working with this data is very important. Users have to save various important information in one place in the application. And this level is called data access level. The back end is the key part of any application. This is part of the logic of an application. How our different application will work in different situations is controlled by it. Back-end design can be complicated. Because there are multiple tasks to perform. The backend design is not visible to the user. The user only sees the front-end design. Manages back-end logic and data storage systems. The back end works according to the needs of the user. And decides whether to give any user access to data. Hidden from the back end user so it can be code or program. The main band design here is because without it we can't do all the work with the front end.

- Create a database.

## **4.3 Interaction Design and UX**

It is designed for how any user interacts with the application. The main goal of interaction design is to provide all the services to the user in the best way. There may be multiple ways to communicate with a user application. But this task is not easy. So the easiest way to communicate is found through this interaction design. Which is easy to understand and easy to operate.

- Create user friendly interaction.
- Providing minimum option.

UX design is known as user experience design. UX design consciousness method. This allows us to understand what the user may need. With UX design we can predict the user's needs in advance.

- Try to understand what the basic needs of the user are.
- Provide information to the user in a difficult situation.

## **4.4 Implementation Requirements**

- This design need implemented in web based application.
- Need database MYSQL.
- Need JSON.
- Need registration verification system.

- Create user interface using DJANGO.
- Need MYSQL query environment.
- Registration form using DJANGO.
- Emergency contact system.
- Make the teacher's profile useful for everyone to see.

#### **4.4.1 Python Language**

When it comes time to develop Web application, the first and most popular option is Python. Python is an interpreted high-level general-purpose programming language. Python's design philosophy emphasizes code readability with its notable use of significant indentation. Its language constructs as well as its object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects. Python is dynamically-typed and garbage-collected. It supports multiple programming paradigms, including structured (particularly, procedural), object-oriented and functional programming. Python is often described as a "batteries included" language due to its comprehensive standard library [1].

#### **4.4.2 DJANGO Framework**

DJANGO is a high-level Python web framework that encourages rapid development and clean, pragmatic design. Built by experienced developers, it takes care of much of the hassle of web development, so you can focus on writing your app without needing to reinvent the wheel. It's free and open source.

#### **4.4.3 SQLite**

Database is the collection of data. There are different methods to manipulate the data. SQLite is often used as the on-disk file format database management system based database [2].

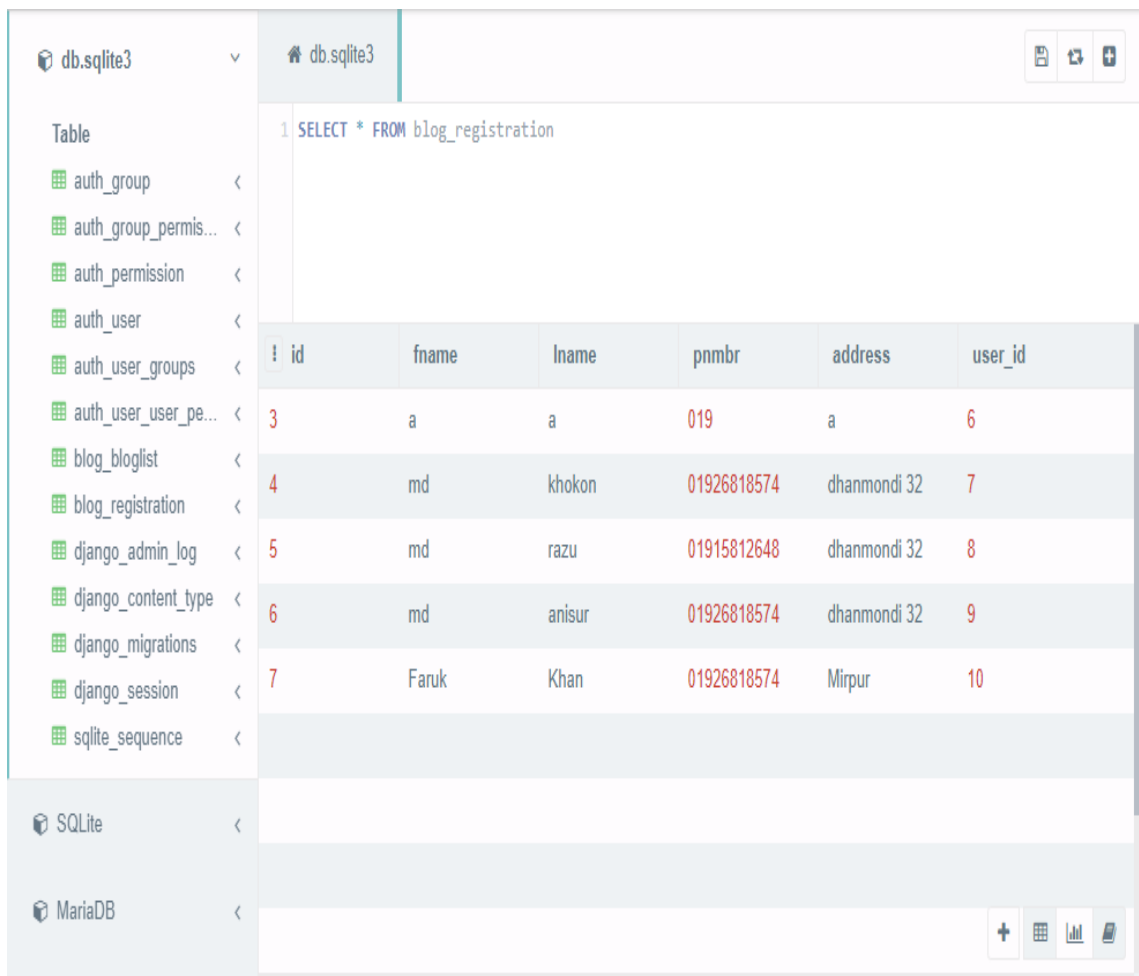
## CHAPTER 5

### IMPLEMENTATION AND TESTING

#### 5.1 Implementation of Database

Here in this application I have used SQ Lite database.

**Users Registration Table:** User Name, email, password, first name, last name, phone number, address stored in this table.



The screenshot shows a database management interface for 'db.sqlite3'. The left sidebar lists various tables, including 'auth\_group', 'auth\_group\_permiss...', 'auth\_permission', 'auth\_user', 'auth\_user\_groups', 'auth\_user\_user\_pe...', 'blog\_bloglist', 'blog\_registration', 'django\_admin\_log', 'django\_content\_type', 'django\_migrations', 'django\_session', and 'sqlite\_sequence'. The main area displays a SQL query: '1 SELECT \* FROM blog\_registration'. Below the query, the results of the query are shown in a table format with the following columns: 'id', 'fname', 'lname', 'pnbr', 'address', and 'user\_id'. The data rows are as follows:

id	fname	lname	pnbr	address	user_id
3	a	a	019	a	6
4	md	khokon	01926818574	dhanmondi 32	7
5	md	razu	01915812648	dhanmondi 32	8
6	md	anisur	01926818574	dhanmondi 32	9
7	Faruk	Khan	01926818574	Mirpur	10

Figure 5. 1: Registration Database.

db.sqlite3

Table

- auth\_group
- auth\_group\_permiss...
- auth\_permission
- auth\_user
- auth\_user\_groups
- auth\_user\_user\_pe...
- blog\_bloglist
- blog\_registration
- django\_admin\_log
- django\_content\_type
- django\_migrations
- django\_session
- sqlite\_sequence

SQLite

MariaDB

```
1 SELECT * FROM django_session
```

! session_key	session_data	expire_date
48tntft7081tk0b81fm2cfahzu7kl1k3	MWE4ZjA4YzM0YzVjYjZiMzhkZDY5...	2021-06-17 14:24:43.631151

Figure 5. 2 : Session Data Table

db.sqlite3

Table

- auth\_group
- auth\_group\_permiss...
- auth\_permission
- auth\_user
- auth\_user\_groups
- auth\_user\_user\_pe...
- blog\_bloglist
- blog\_registration
- django\_admin\_log
- django\_content\_type
- django\_migrations
- django\_session
- sqlite\_sequence

SQLite

MariaDB

```
1 SELECT * FROM django_admin_log
```

! id	action_time	object_id	object_repr	change_message	content_type	user_id	action_flag
1	2021-06-0...	4	asdf	4	1	3	
2	2021-06-0...	2	ass	4	1	3	
3	2021-06-0...	5	fdsa	4	1	3	
4	2021-06-0...	3	qwe	4	1	3	

Figure 5. 3: Admin Data Table

## 5.2 Implementation of Front-end Design

We were more concern to build a user friendly front-end design.



**Blog Account Registration!**

Username:  
  
Required. 150 characters or fewer. Letters, digits and @/./+/-/\_ only.

Email address:

Password:

Fname:

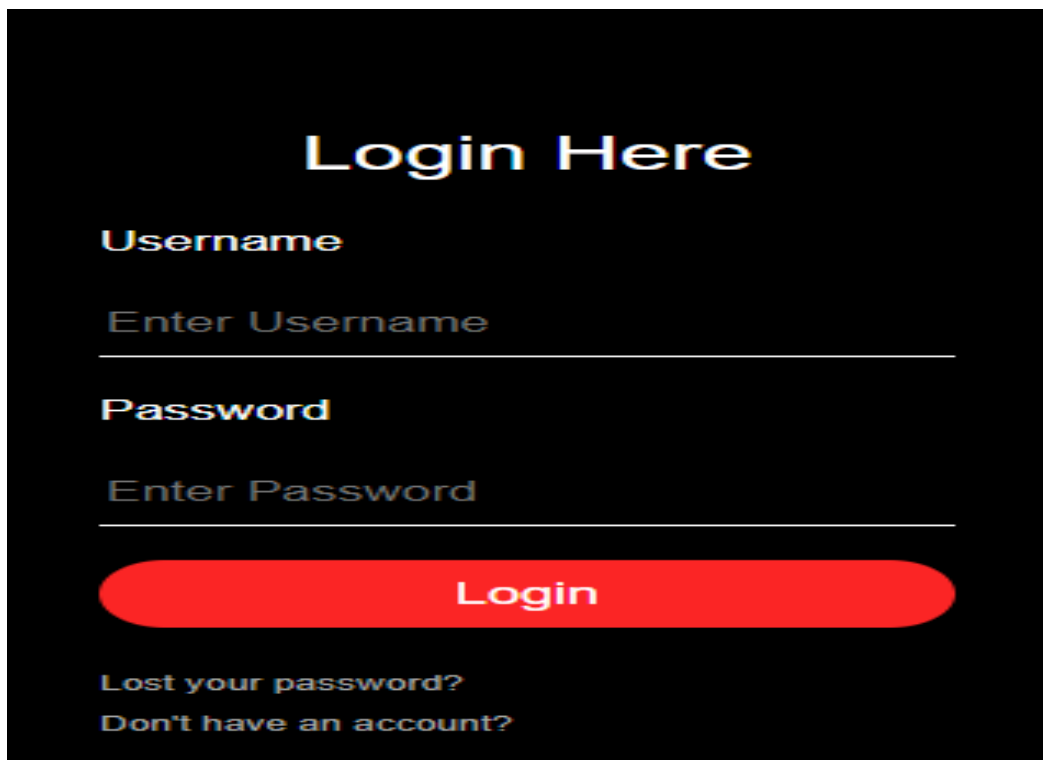
Lname:

Pnmb:

Address:

[Register](#) [Already have an account?](#)

Figure 5. 4: Registration Page



**Login Here**

**Username**  
Enter Username

**Password**  
Enter Password

[Login](#)

[Lost your password?](#)  
[Don't have an account?](#)

Figure 5. 5: Login Page



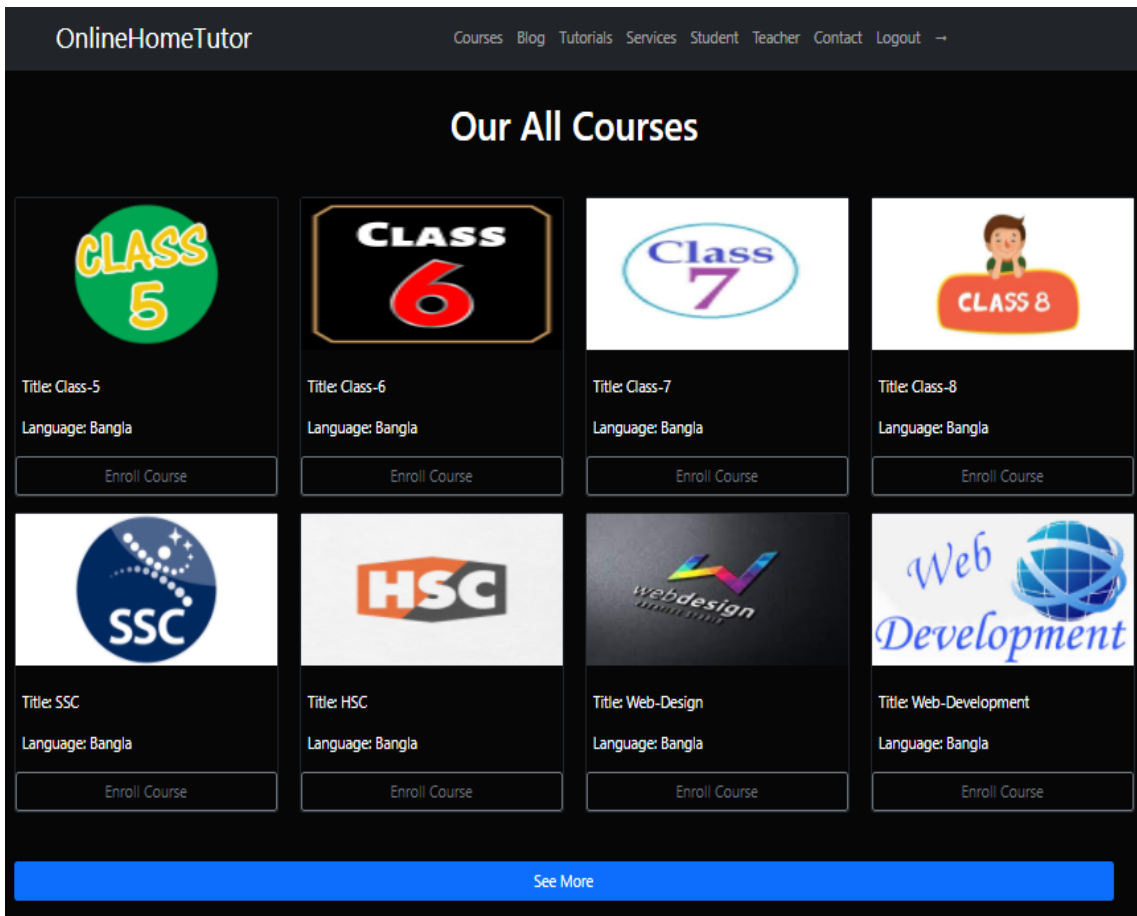


Figure 5. 6: Home Page

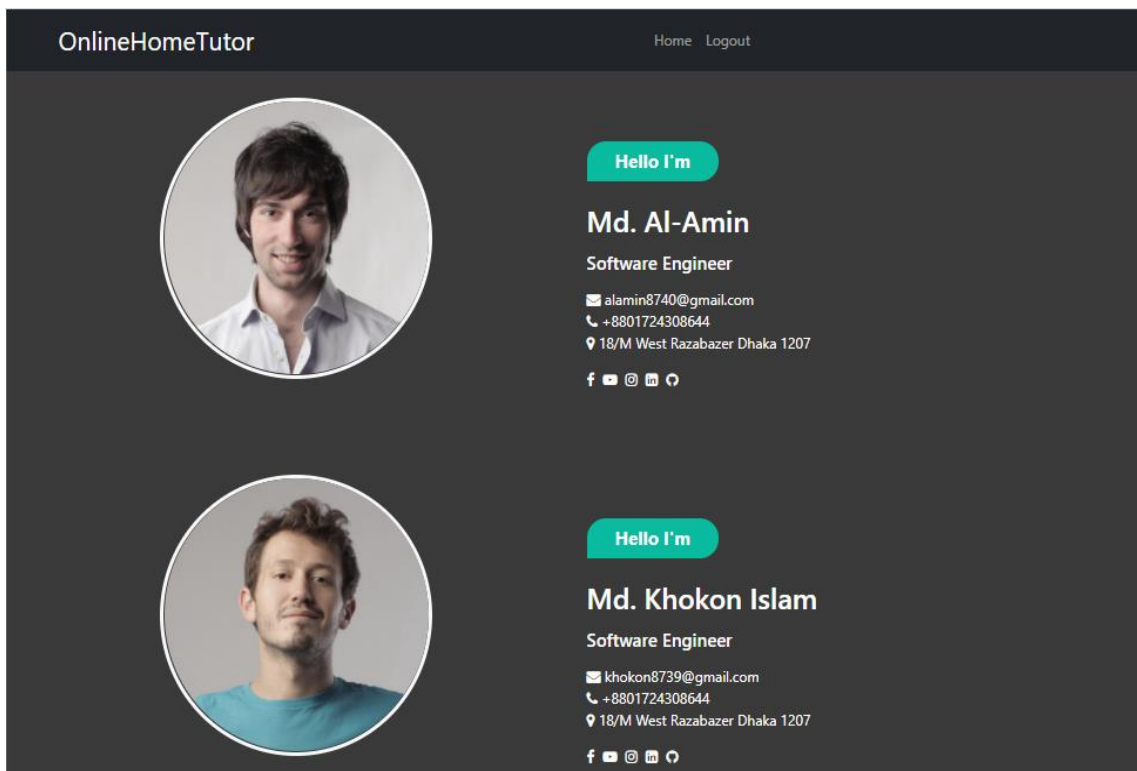


Figure 5.7: Teacher Information Page

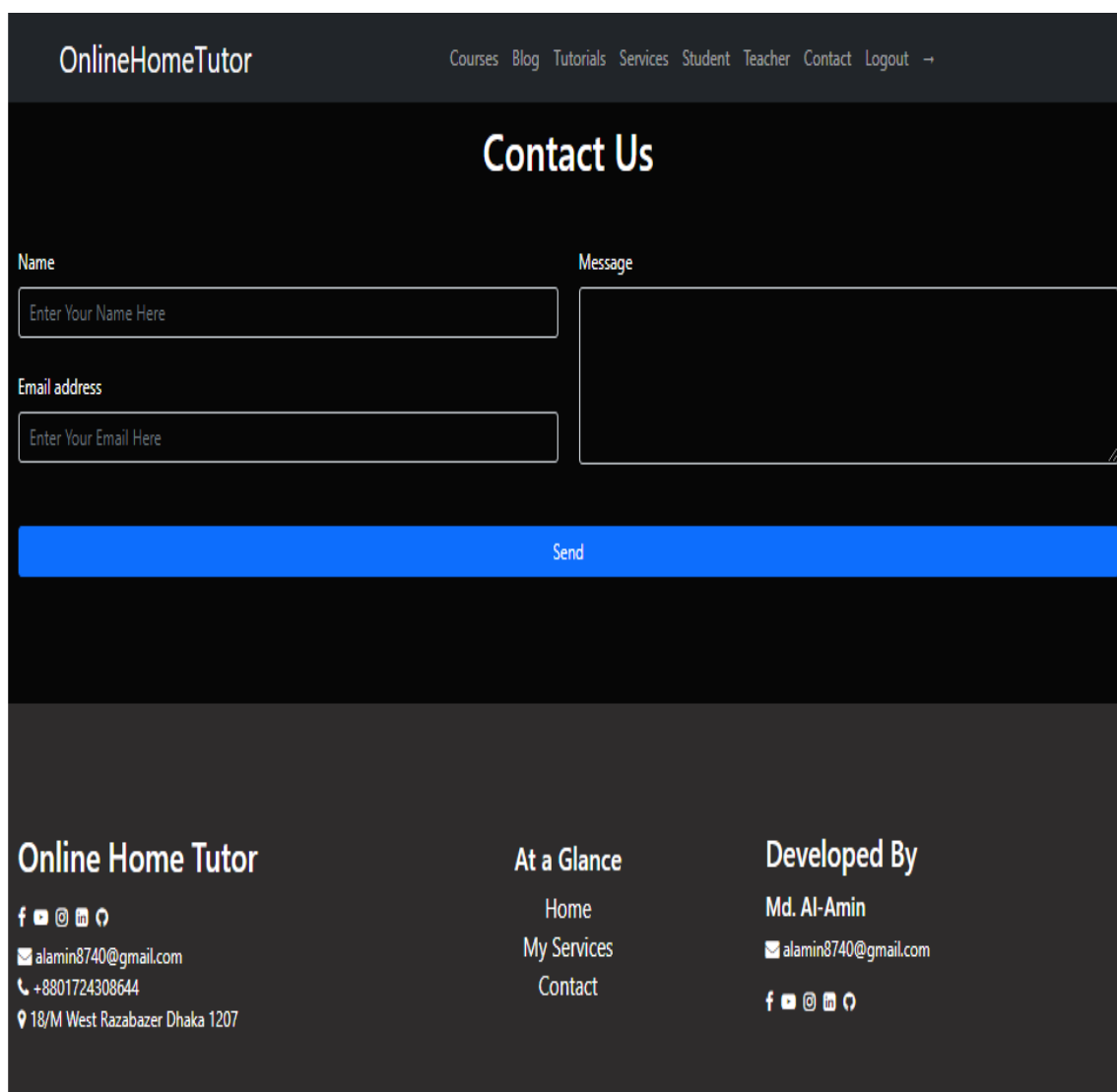


Figure 5.8: Contact Page

### 5.3 Implementation of Interactions

Here I have created an easy way to interact with the application. Any user can login to this system if they have already registered. And if someone has not registered then he has to register first by filling the registration form. And then he can login. And we can use this learning platform.

### 5.4 Testing Implementation

After creating a system, it is checked whether there are any errors against the requirements of that system. Test implantation is a process where a tester tests the application with a variety of data. And through this test he can come to the conclusion. How our application is working. And if we detect a problem with this application, we fix it.

## 5.4.1 Table

5.4.1 Table: Testing Implementation

Id	First Name	Last Name	Phone Number	Address	User Id
Login	Login email, password via	Successfully Log in	Successfully Log in	Pass	30-10-2018

## 5.5 Test Results and Reports

We need to create a test result in a formal way so that we can find out the test result in a very simple way. From the above test table we can come to a conclusion that our application is working properly.

## Principles of Testing

All the test should meet the customer requirements

- To make our software testing should be performed by third party
- Exhaustive testing is not possible. As we need the optimal amount of testing based on the risk assessment of the application.
- All the test to be conducted should be planned before implementing it
- Start testing with small parts and extend it to large parts.

Basically through test result we can decide how well the application is working.

## **CHAPTER 6**

### **CONCLUSION AND FUTURE SCOPE**

This is the last chapter of our project work, here we will discuss finally what we have manage to achieve and how it could have been more.

#### **6.1 Discussion and Conclusion**

Eventually I had to create my own application. It feels like a dream come true. I wasn't sure about anything when I first thought of this application. My Father once said “dreams don't work if they don't work”.

If by this application millions of students in remote areas of our country can learn good quality education from the best teachers in the country. Then I will think that my hard work has been justified. My first goal was to create an application that would help students in remote areas of the country to complete their studies easily and well. Nowadays students go far and wide to read a subject privately from a good teacher. There are some remote areas where students do not get this opportunity. Therefore, through this application, the good quality reading rate of all the students as well as the students especially in remote areas will increase a lot. Since with the help of this application you can take lessons from the best teachers of the country at home. So anyone sitting at home will get the right direction in the right environment to keep pace with the times.

Nothing was possible except the grace of Almighty God, I am very happy and satisfied with where I have reached

#### **6.2 Scope for Further Developments**

There are many more development opportunities for this application as discussed below.

- This application should be made in IOS version.
- Using a faster server.
- Identify different types of students using artificial intelligence and provide them with different types of advertisements.
- Arrange your own online chatting for the users of this application.
- Creating a system to automatically provide directions to students on which courses they have taken and which courses they should take at the moment.
- Creating more user-friendly user interfaces in the future.

- Proper maintenance and publicity.
- Keep updating the application regularly.
- Create job opportunity
- Creating some free content for students

## **APPENDIX**

### **Appendices A**

**Project Reflection:** The summer 2020 semester I have started working on creating this online home tutor web app. In this journey I encountered many obstacles. I have followed the instructions of my esteemed supervisor. And my determination has forced me to reach the goal. I have followed the model to implement my project. The journey of creating this application was not easy for me at all. But in the end it was an eventful journey.

My main inspiration for creating this app has been through my own bitter experience. I grew up in a remote village. So I went to the village school from my childhood. My main problem there was the lack of good teachers. The teacher who used to take Bangla classes in the village school sometimes took math classes but we didn't understand anything. There are teachers everywhere but when I got up to a little bigger class, class seven, eight, SSC, HSC it became dangerous for me. Because there are no good science teachers in the village. So I cycled 12 to 15 miles [12 to 15 km] each day to get to private schools to study with different teachers. And after so many journeys every day, studies were not done well. From that experience, I now thought that if there was a platform where I could sit in my village and read privately to any BUET student. Then it would be very convenient for me. Let's start building this application with that in mind. With the help of this application, students will be able to easily learn from the best teachers of the country from different remote areas while sitting at home. Which will greatly reduce their suffering. You don't have to make a long journey every day. So this application is a very necessary application. Which is able to meet many urgent needs of students.

I hope this app will help students a lot. And we want to keep an eye on this app and create new features in the future.

## **Appendices B**

### **Combination and Acronyms**

UX: User Experience.

UI: User Interface.

JSON: JavaScript Object Notation.

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