

CS 432 - DATABASES

ASSIGNMENT - 3



TEAM: OCTACORE

Assignment 3: Implementing a Web App using MySQL

| G1 | G2 |
|-----------------------------|-----------------------|
| Sujith - 21110100 | Jethru - 21110089 |
| Uday - 21110084 | Himasagar - 21110158 |
| Keerthi - 21110176 | Sudharshan - 21110218 |
| Ajith - 21110045 | Rudreshwar - 21110172 |
| Karna Pardheev Sai-21110097 | Vinay - 21110125 |

3.1 Responsibility of G1:

We have successfully designed the application's front end using HTML, CSS, and JavaScript to create a visually appealing user interface. The design follows modern standards and user experience principles to ensure users' ease of use and clarity.

Additionally, We have integrated Flask into the application to provide dynamic content generation, handle form submissions, and manage user sessions. Flask enables efficient communication between the front and back end, allowing for seamless interaction and data processing.

Overall, the combination of front-end design with HTML/CSS/JSL and Flask and MySQL database integration for the backend creates a robust and user-friendly web application that meets the specified requirements.

3.2 Responsibility of G2:

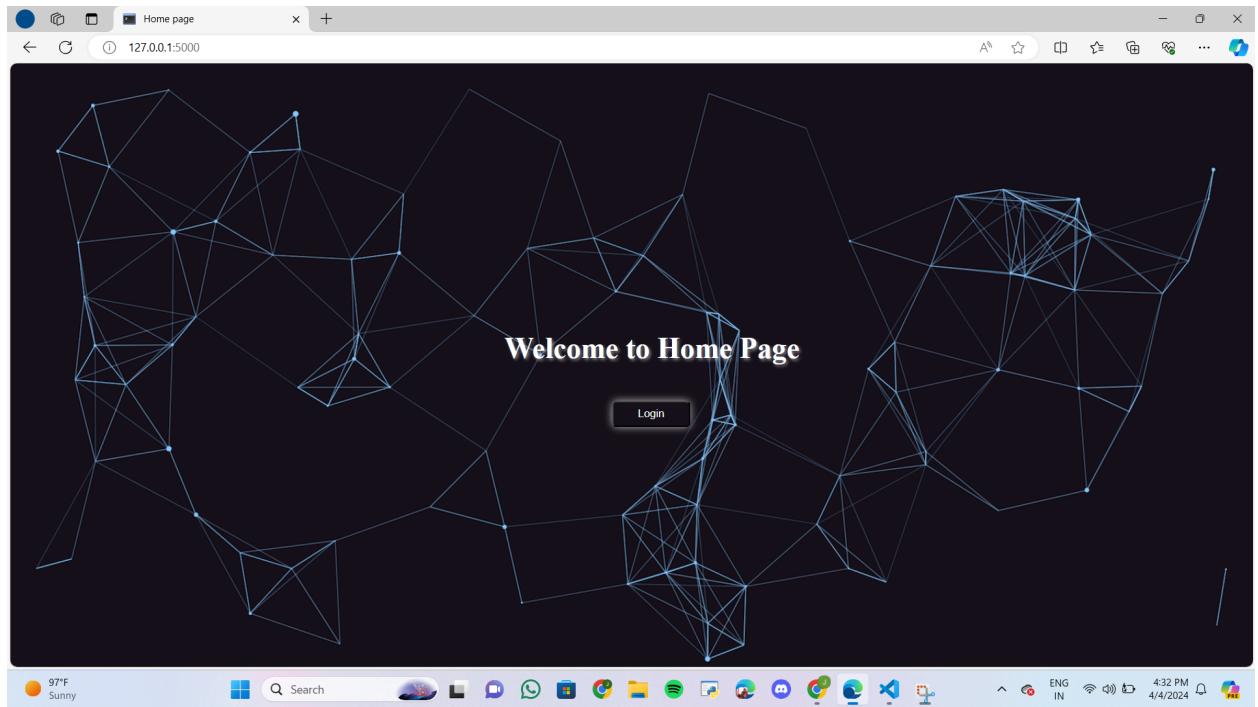
After integrating MySQL into WebApp, we ensured that the backend functions correctly by managing the database interactions, ensuring data integrity, and handling queries efficiently. This involves:

- Establishing a connection to the MySQL database from the Flask application.
- Implementing CRUD (Create, Read, Update, Delete) operations to interact with the database.
- Creating and maintaining database schemas, tables, and relationships.
- Executing SQL queries to retrieve, update, and delete data based on user input.
- Optimizing database queries and performance to ensure scalability and responsiveness of the WebApp.
- Testing database functionality to ensure the reliability and correctness of data operations.

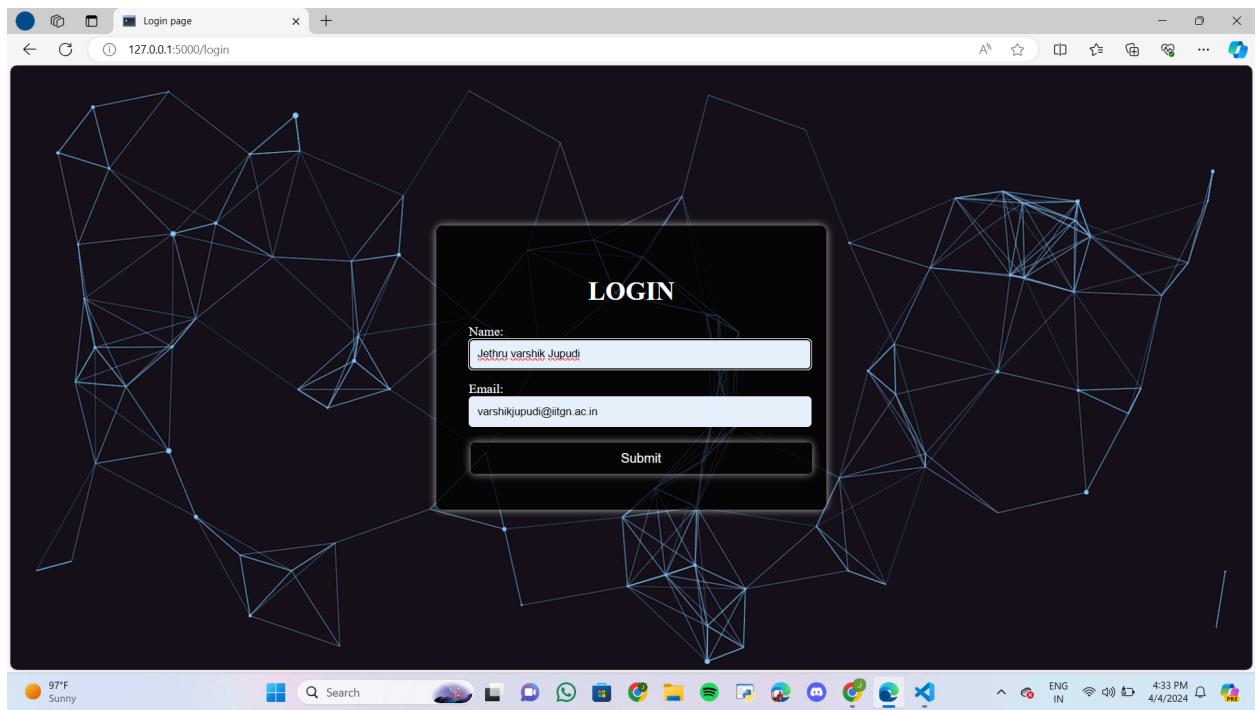
Overall, G2 played a crucial role in integrating MySQL into WebApp and ensuring the proper functioning of the backend to manage data effectively and support the application's overall functionality.

3.3 Responsibility of G1 & G2:

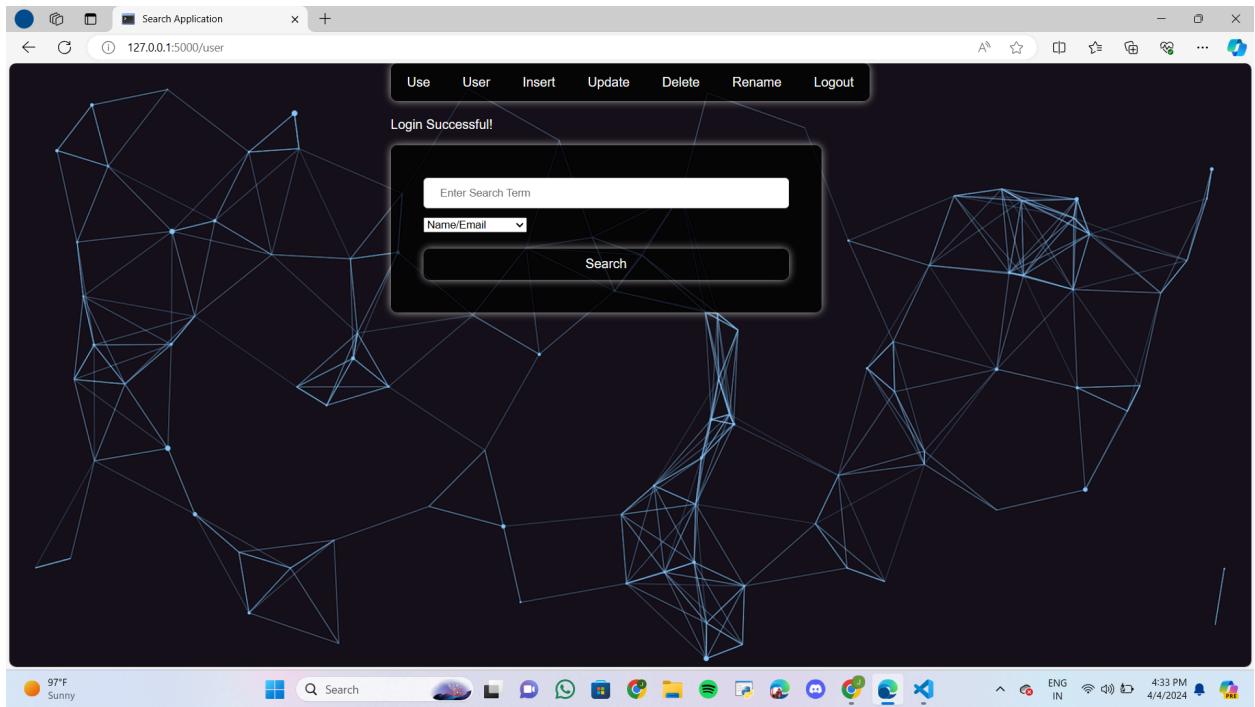
First, we will land on the homepage and configure the MySQL database correctly. Here is what it looks like



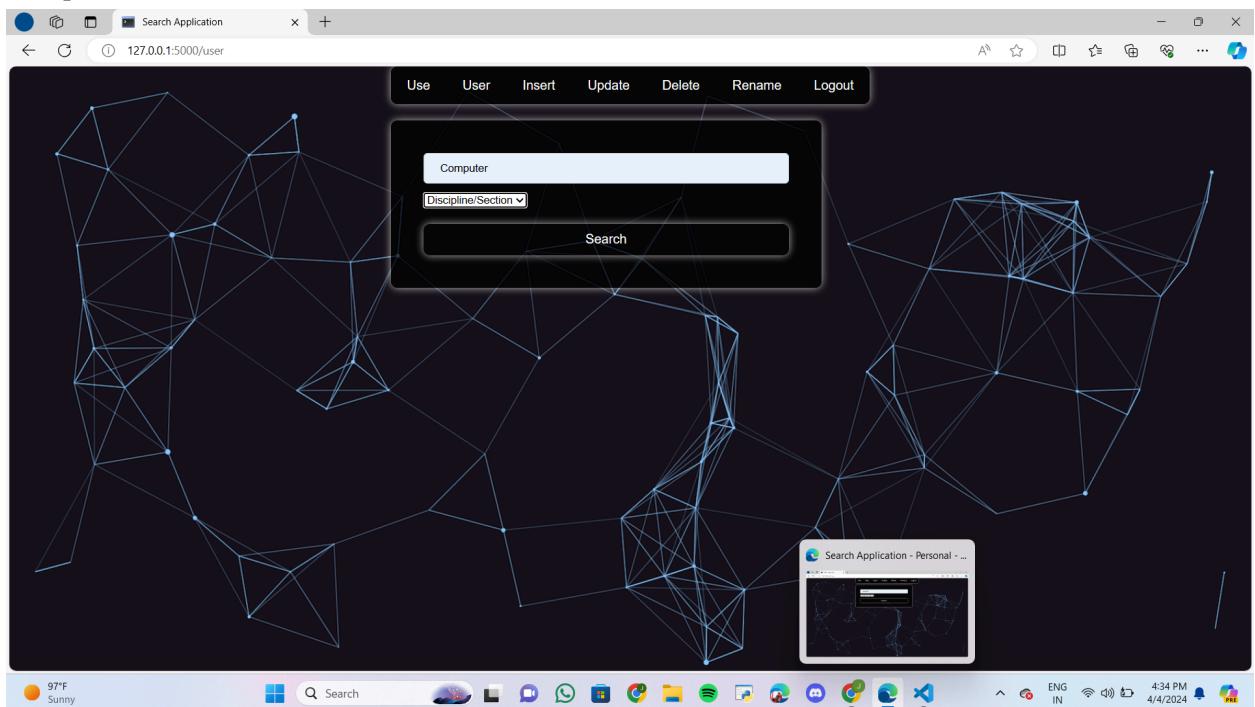
Next, we will log in as a regular user who is not an Administrator.



Our phone directory/app is only accessible to the IITGN community. So, we should always log in using the @iitgn.ac.in email address. The below image shows how it will be after login. It will be redirected to the User page or index1.html. The earlier home page is index.html



In this user page, we can search for a person's complete information using search via Name/Email or Discipline/Section column:



As we search for "Computer" in the Discipline/Section column, we will get all records that have Computer in the Discipline/Section column regardless of whether the person is a Teaching staff or non-teaching staff member, Student Facility or Block. Below is the output:

The screenshot shows a web browser window titled "Search Application" at the URL "127.0.0.1:5000/user". The navigation bar includes options: Use, User, Insert, Update, Delete, Rename, and Logout. A search interface with a search term input field and dropdown menu is visible. Below it is a table with columns: Name, Designation, Email, Discipline/Section, Work, Home/Emergency, and Office. The table data is as follows:

| Name | Designation | Email | Discipline/Section | Work | Home/Emergency | Office |
|---------------------|---------------------|--------------------------|----------------------------------|------------|----------------|-----------|
| Abhishek Bichhawat | Assistant Professor | abhishek.b@iitgn.ac.in | Computer Science and Engineering | 2573 | 1573/ | AB13/405A |
| Anirban Dasgupta | Professor | anirbandg@iitgn.ac.in | Computer Science and Engineering | 2463 | 1463/ | AB13/405G |
| Bhavesh B Jain | Btech | jainbhavesh@iitgn.ac.in | Computer Science Engineering | 9000000006 | / | |
| Dhairya Balaji Shah | Btech | shahdhairy@iitgn.ac.in | Computer Science Engineering | 9000000004 | / | |
| Mayank Singh | Assistant Professor | singh.mayank@iitgn.ac.in | Computer Science and Engineering | 2538 | 1538/ | AB13/403B |
| Progyan Balaji Das | Btech | progyandas@iitgn.ac.in | Computer Science Engineering | 9000000003 | / | |

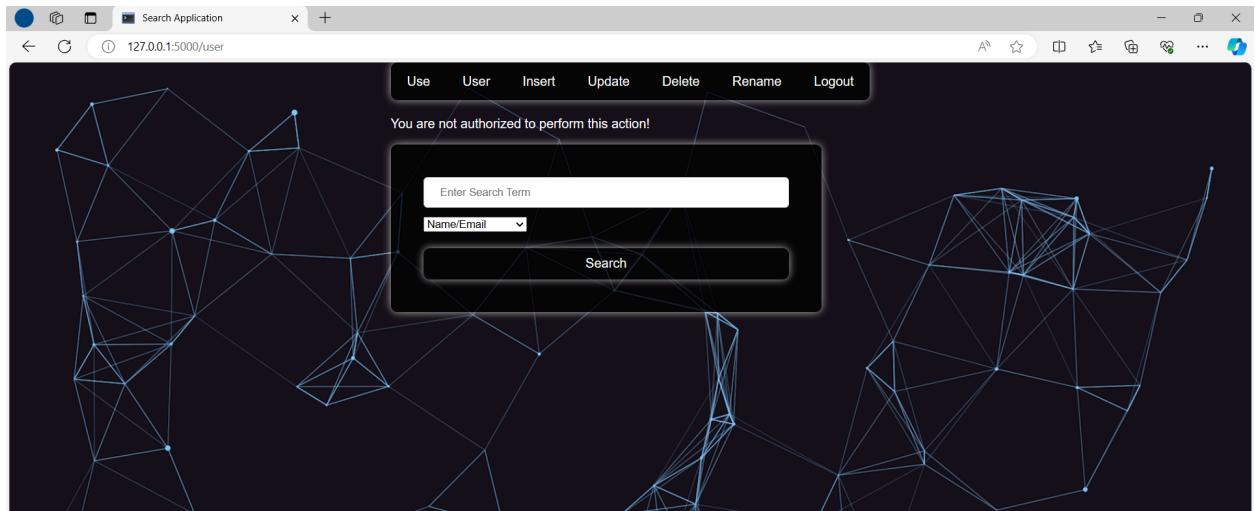
Similarly, we can search for information about anyone according to our needs.

Now, let us look at the different options on the navigation bar. We are currently on the user page, so if we click User, We are redirected to the same page without any table showing. But if we opt for anything other than the User page, say Use page. Here is what it looks like select the Use option.

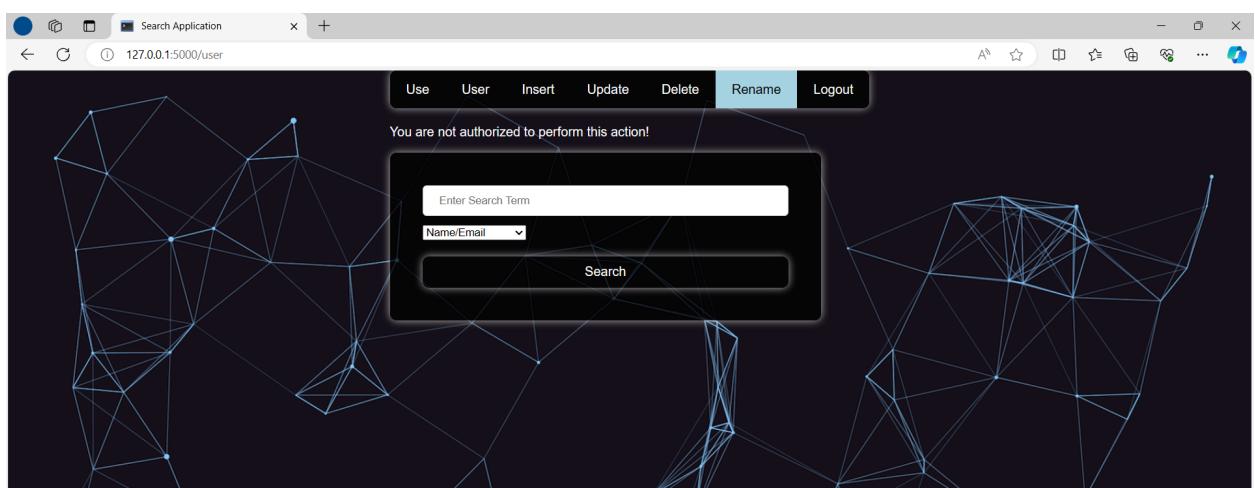
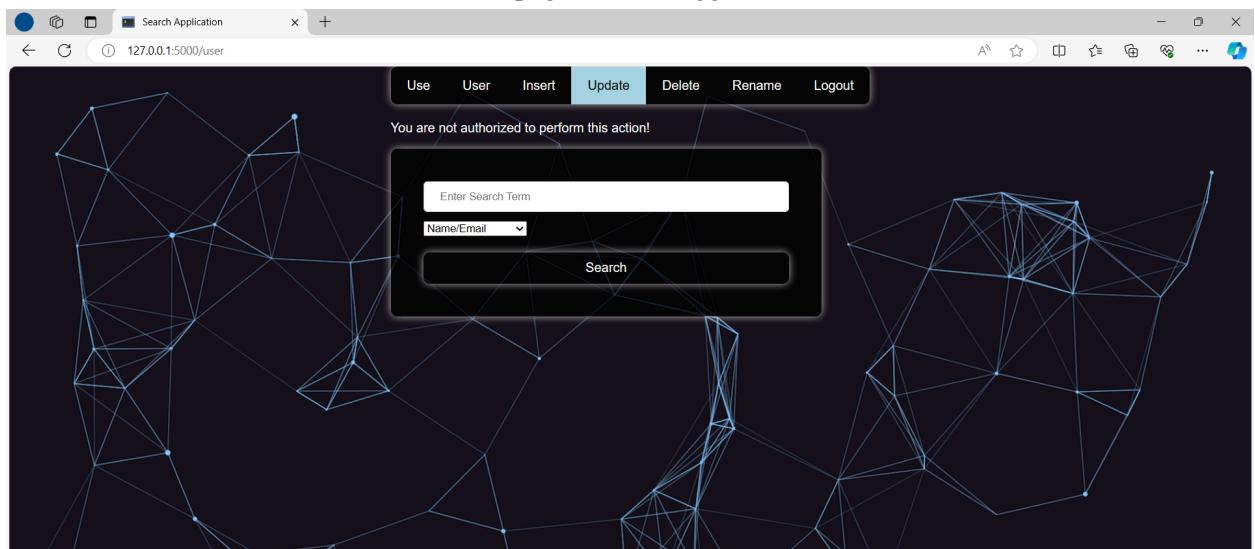
The screenshot shows a web browser window titled "Search Application" at the URL "127.0.0.1:5000/user". The navigation bar has "Use" selected, while "User" is highlighted in blue. The rest of the interface is identical to the previous screenshot, featuring a search interface and a table of user data.

| Name | Designation | Email | Discipline/Section | Work | Home/Emergency | Office |
|--------------------|---------------------|------------------------|----------------------------------|------|----------------|-----------|
| Abhishek Bichhawat | Assistant Professor | abhishek.b@iitgn.ac.in | Computer Science and Engineering | 2573 | 1573/ | AB13/405A |
| Anirban Dasgupta | Professor | anirbandg@iitgn.ac.in | Computer Science and Engineering | 2463 | 1463/ | AB13/405G |

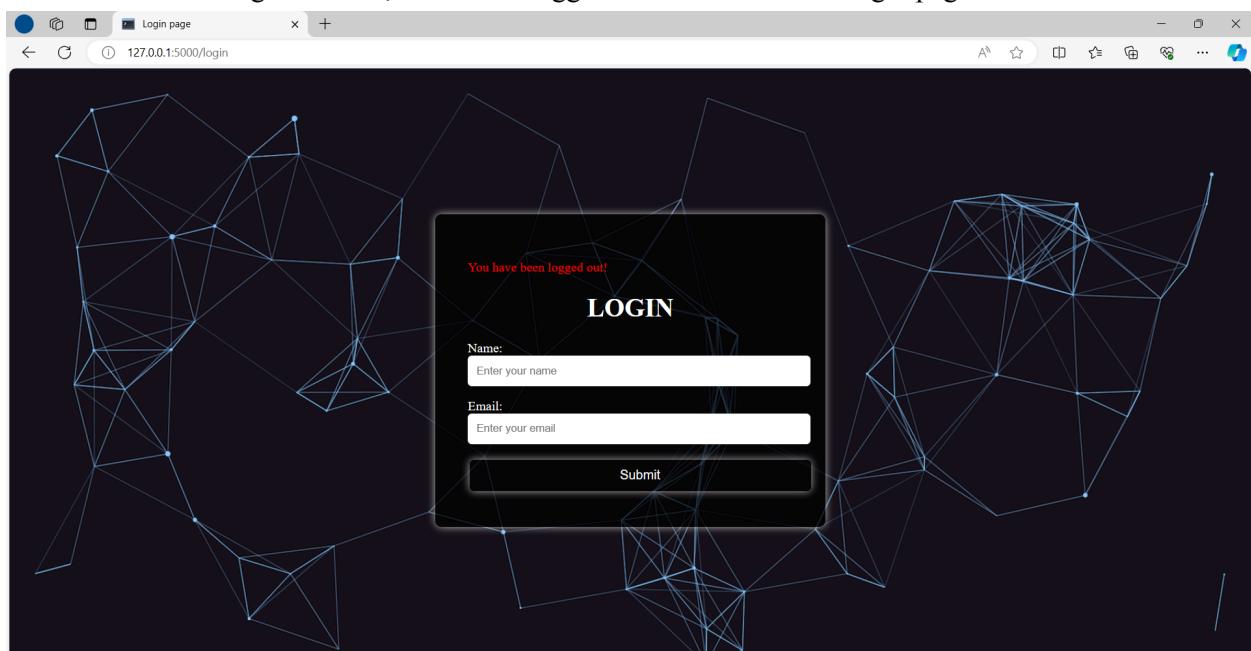
As shown below, we will be redirected to the User page, again saying, "You are not authorized to perform this action!" This is expected because we are not administrators. Only administrators can access the Use, Insert, Update, Delete, and Rename options. So, it will send a message and redirect you to the User page.



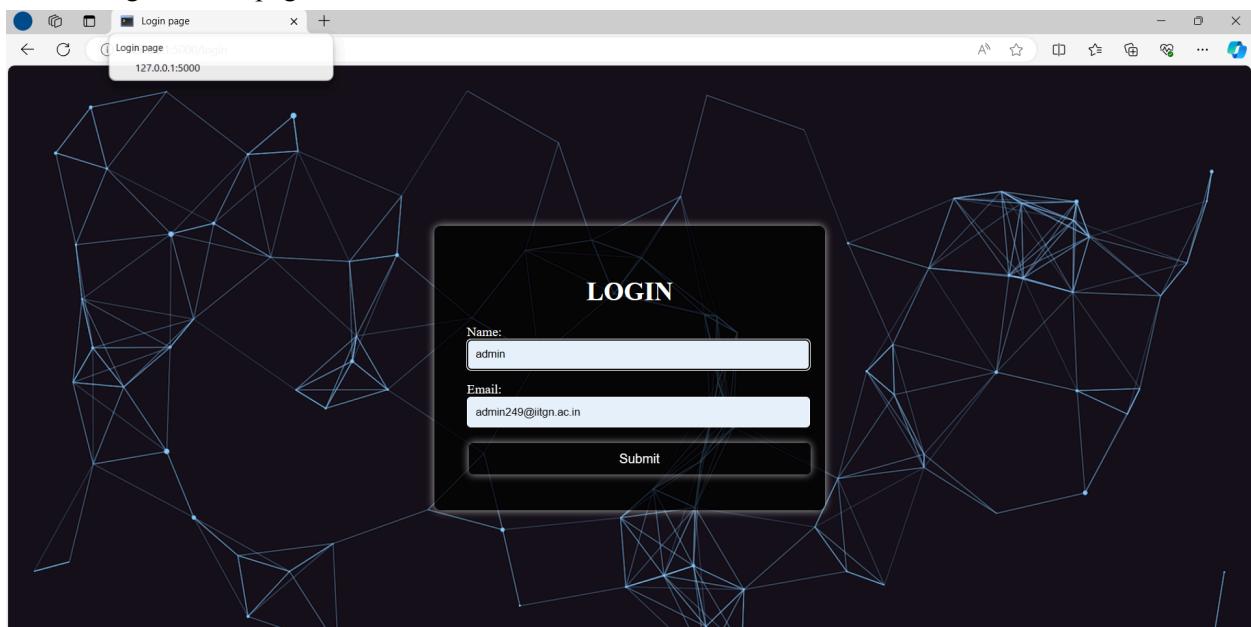
This is shown below; we can't access these pages unless logged in as administrators.

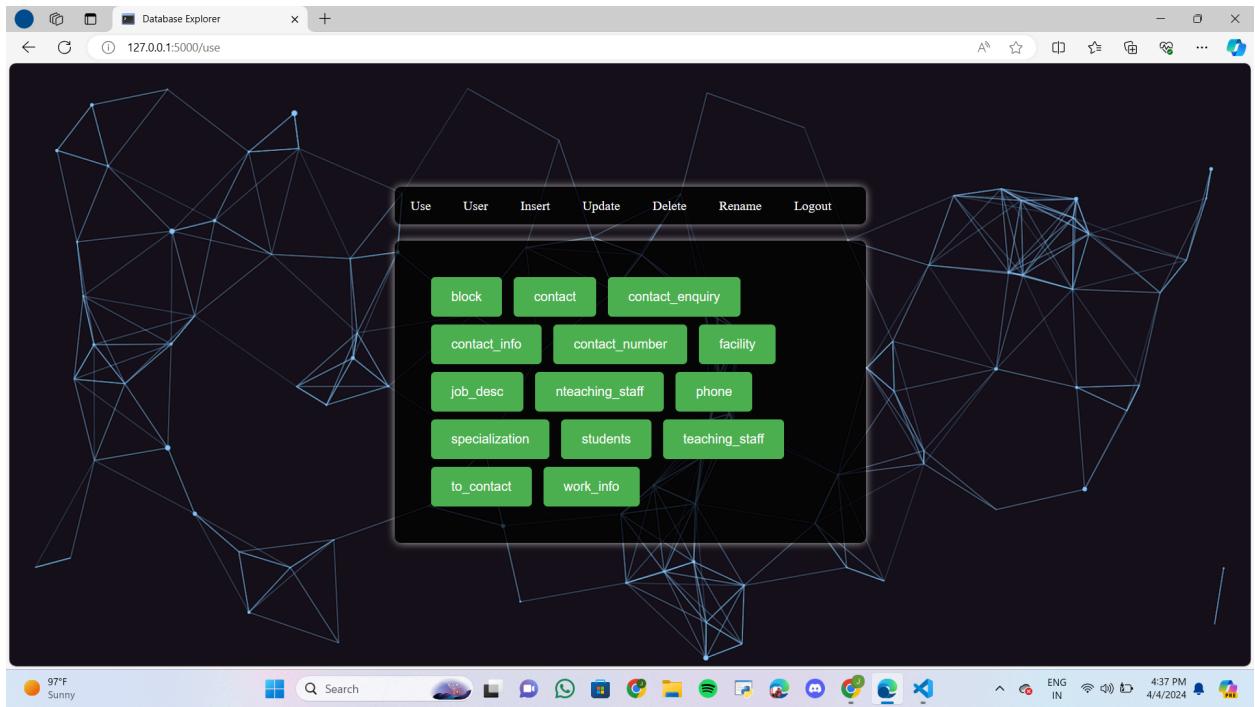


When we click the logout button, we will be logged out and land on the login page.

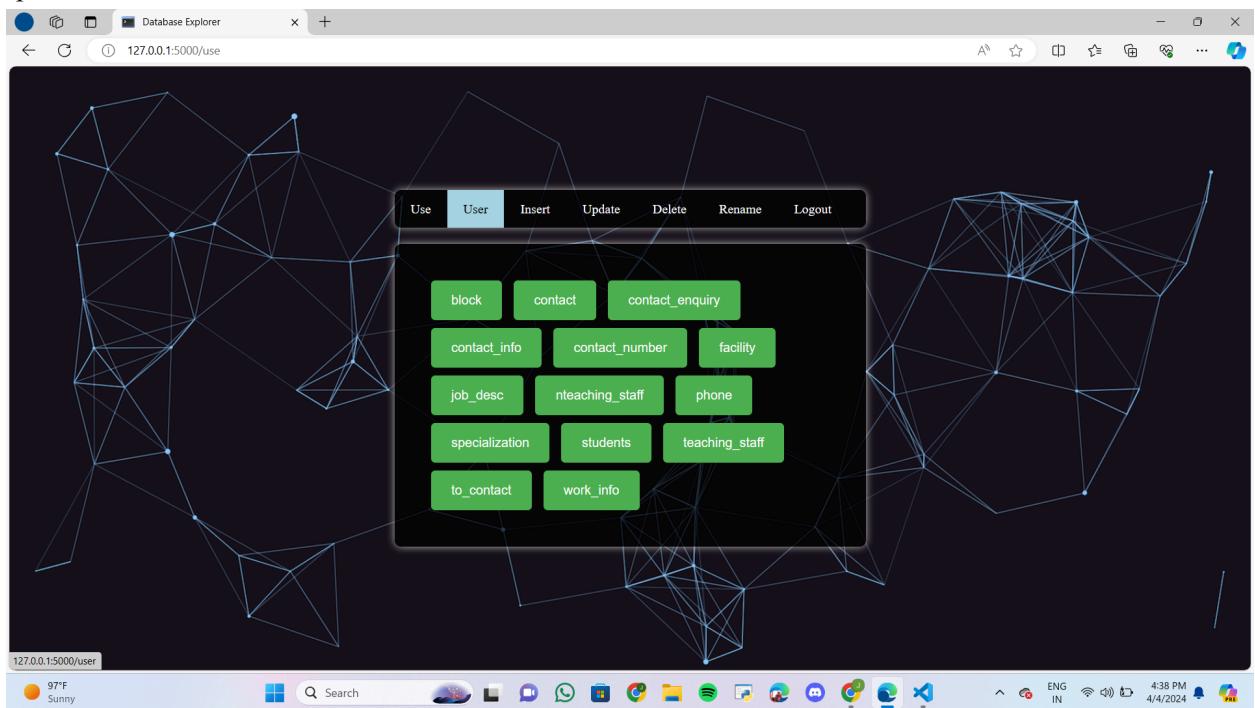


Now, we will try to log in as an administrator. The administrator's Name is "admin", and the email is "admin249@iitgn.ac.in". With this, we will log in as an administrator and land on the Use page rather than the regular User page.

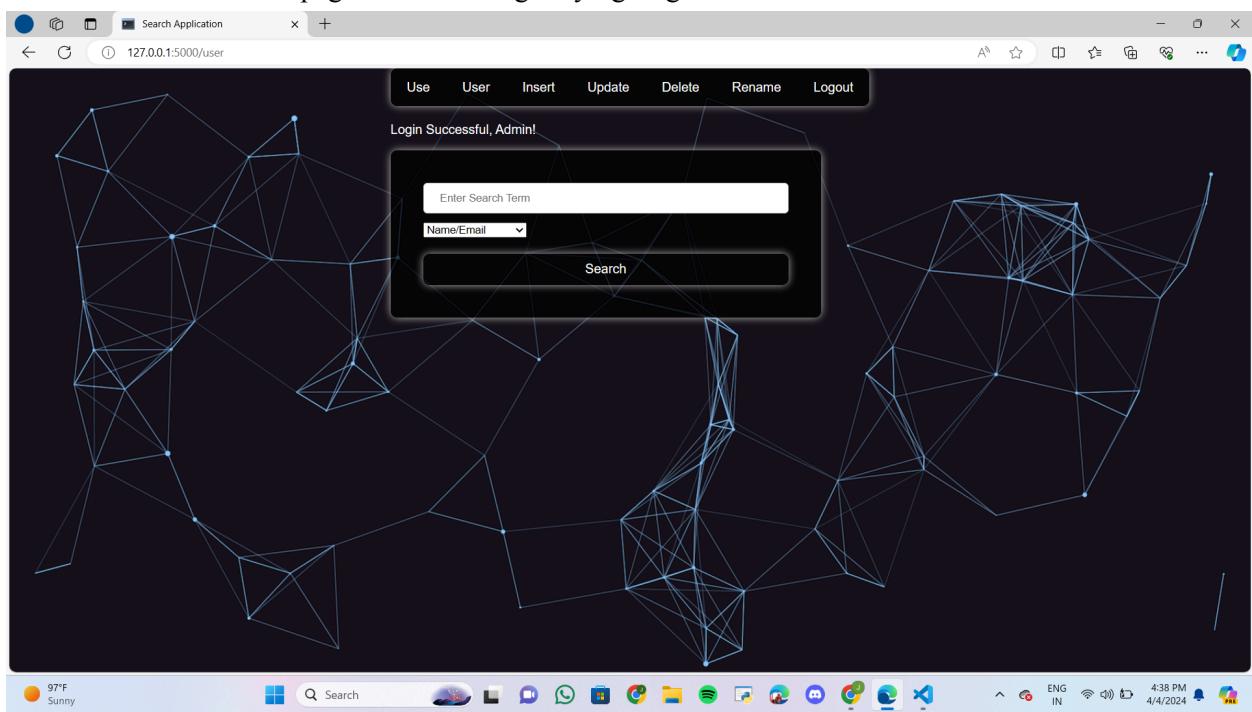




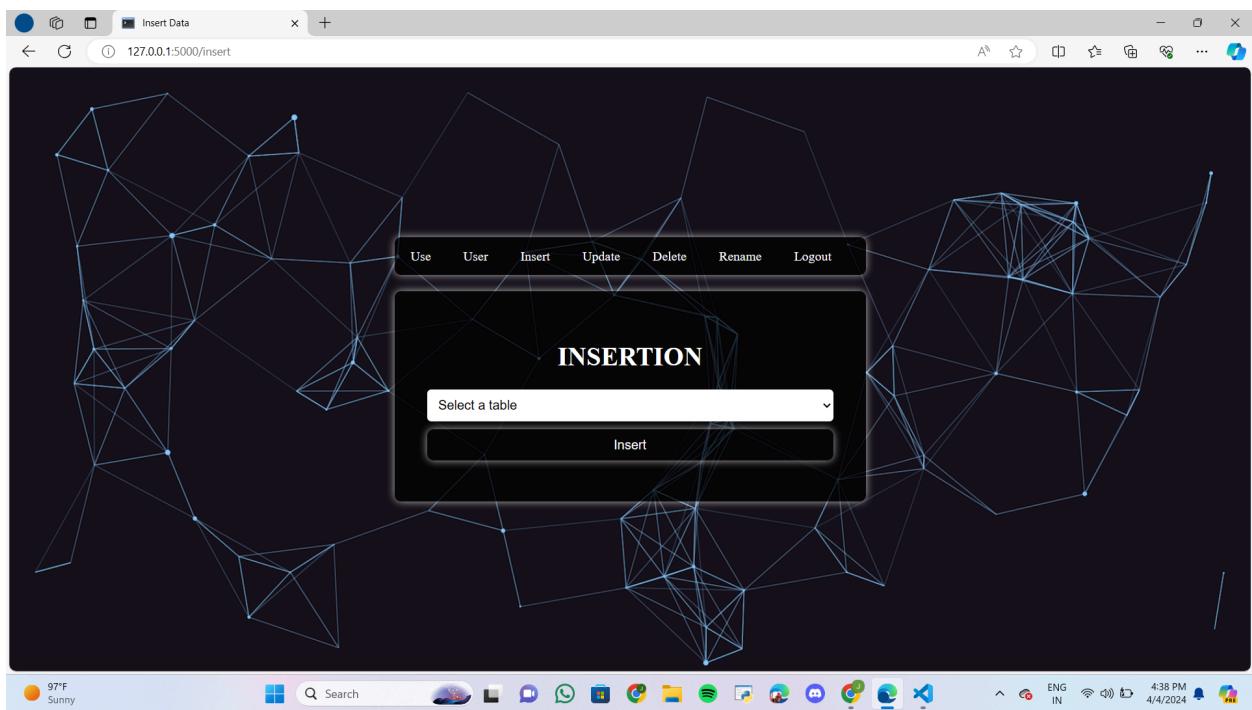
The above page is the Use page; here we can see all the tables in our database. Now, let's check the User option in Navbar.



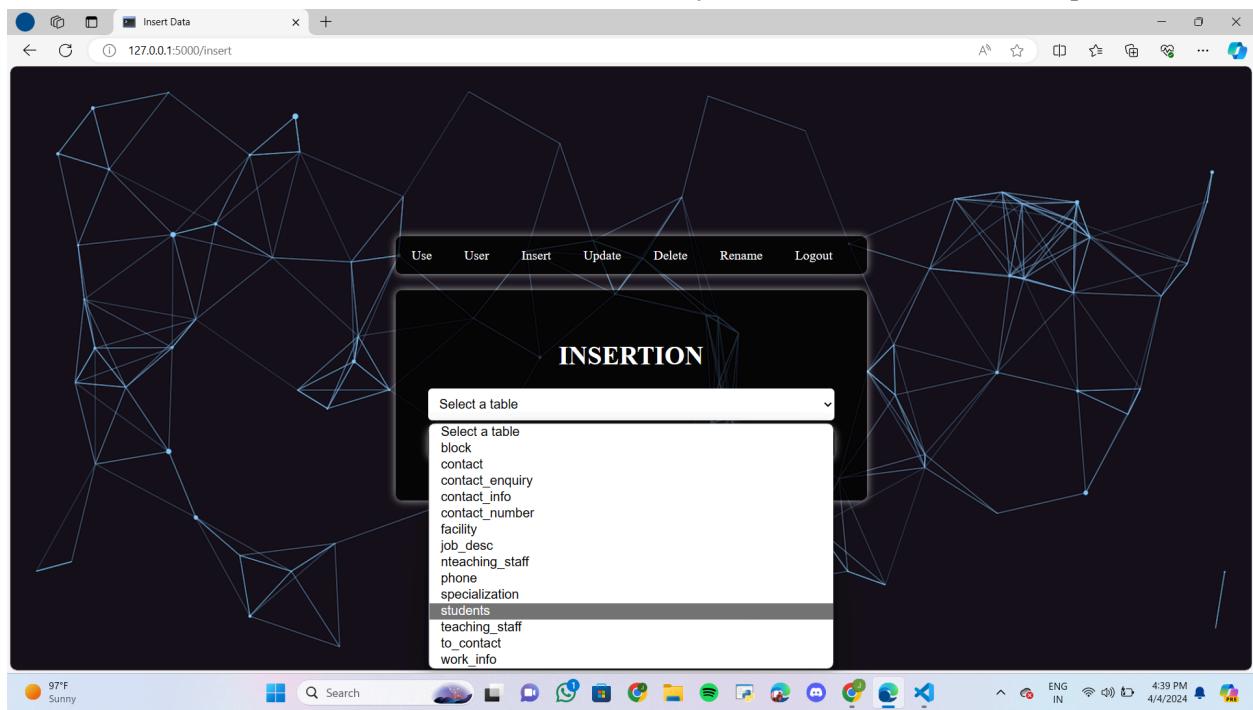
We will land on the User page with a message saying Login successful Admin!



As we log in as the admin, we can access the Use, Insert, Update, Delete, and Rename options. Shown Below:



Let us see how this insertion is done; select the table name you want to insert into from dropdown:

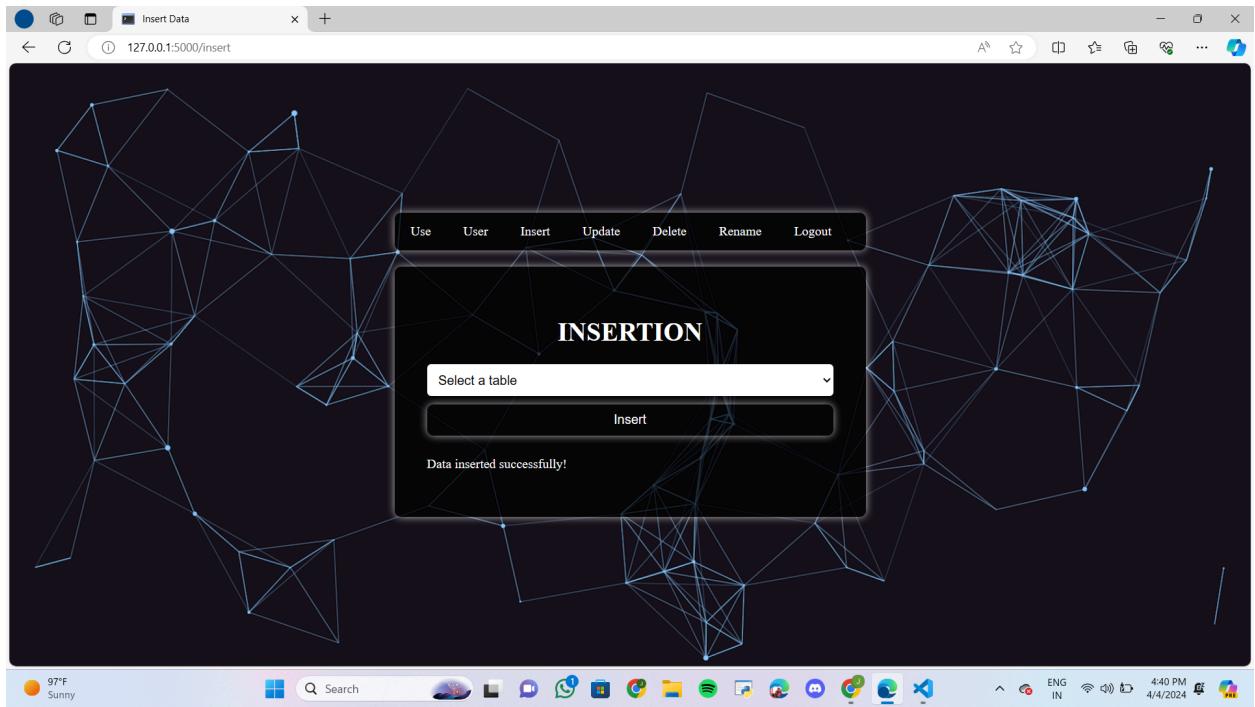


Within the same page, we will get attributes of the selected table, asking to insert the values:

The screenshot shows a web browser window titled "Insert Data" with the URL "127.0.0.1:5000/insert". The page has a dark background with a light blue network graph overlay. At the top is a navigation bar with links: Use, User, Insert, Update, Delete, Rename, and Logout. Below the navigation bar is a central "INSERTION" form. The form has a dropdown menu set to "students" and seven input fields. The input fields are labeled: Enter Roll_number, Enter First_name, Enter Middle_name, Enter Last_name, Enter Email_id, Enter Discipline, and Enter Program. A large "Insert" button is at the bottom of the form.

This screenshot shows the same web application after some values have been entered into the form. The "Roll_number" field contains "2111007", the "First_name" field contains "K", and the "Middle_name", "Last_name", "Email_id", "Discipline", and "Program" fields all contain "K". The rest of the fields remain empty. The "Insert" button is visible at the bottom.

As shown above, give some values to insert. Note that we did not handle exceptions here. So when we try to provide Null values to an attribute with NOT NULL constraint, it will give a MySQL error. This can be done and could have a popup saying not good insertion in future. Once inserted it will say data inserted.



We may check this on the Use page. Go to the Use page and select the button we want to check, which is the Students table here: We can see the 2111007 entry. This can also be seen on the MySQL workbench with the right code. When checked, it works wonderfully.

| Roll_number | First_name | Middle_name | Last_name | Email_id | Discipline | Program |
|-------------|------------|-------------|-----------|-------------------------------|------------------------------|---------|
| 20110002 | Abhishek | Balaji | Mungekar | abhishek.mungekar@iitgn.ac.in | Mechanical Engineering | Btech |
| 20110003 | Progyan | Balaji | Das | progyandas@iitgn.ac.in | Computer Science Engineering | Btech |
| 20110004 | Dhairya | Balaji | Shah | shahdhairyा@iitgn.ac.in | Computer Science Engineering | Btech |
| 20110005 | Varad | Desh | Seshpande | varadseshpande@iitgn.ac.in | Chemical Engineering | Btech |
| 20110006 | Bhavesh | B | Jain | jainbhavesh@iitgn.ac.in | Computer Science Engineering | Btech |
| 2111007 | K | None | K | K | K | K |
| 21110089 | JAY | None | JAY | ja@ | B | C |
| 252 | Vinay | Amit | Mappa | mappavinay@iitgn.ac.in | Mechanical Engineering | Btech |

Now let's check the update option. Let's update the Name of roll number 2111007 student's First name from K to Jay:

Update Data

127.0.0.1:5000/update

students

Enter value for Roll_number
2111007

Enter value for First_name
Enter value for First_name

Enter value for Middle_name
Enter value for Middle_name

Enter value for Last_name
Enter value for Last_name

Enter value for Email_id
Enter value for Email_id

Enter value for Discipline
Enter value for Discipline

Enter value for Program
Enter value for Program

Enter attribute to update:
First_name

Enter new value:
Jay

Tomorrow's high
To break record

Search

ENG IN 4/4/2024 4:41 PM

Database Explorer

127.0.0.1:5000/usage/students

| Roll_number | First_name | Middle_name | Last_name | Email_id | Discipline | Program |
|-------------|------------|-------------|-----------|-------------------------------|------------------------------|---------|
| 20110002 | Abhishek | Balaji | Mungekar | abhishek.mungekar@iitgn.ac.in | Mechanical Engineering | Btech |
| 20110003 | Progyan | Balaji | Das | progyandas@iitgn.ac.in | Computer Science Engineering | Btech |
| 20110004 | Dhairya | Balaji | Shah | shahdhairya@iitgn.ac.in | Computer Science Engineering | Btech |
| 20110005 | Varad | Desh | Seshpande | varadseshpande@iitgn.ac.in | Chemical Engineering | Btech |
| 20110006 | Bhavesh | B | Jain | jainbhavesh@iitgn.ac.in | Computer Science Engineering | Btech |
| 2111007 | Jay | None | K | K | K | K |
| 21110089 | JAY | None | JAY | ja@ | B | C |
| 252 | Viney | Amit | Mappa | mappavinay@iitgn.ac.in | Mechanical Engineering | Btech |

Search

Roll_number

First_name

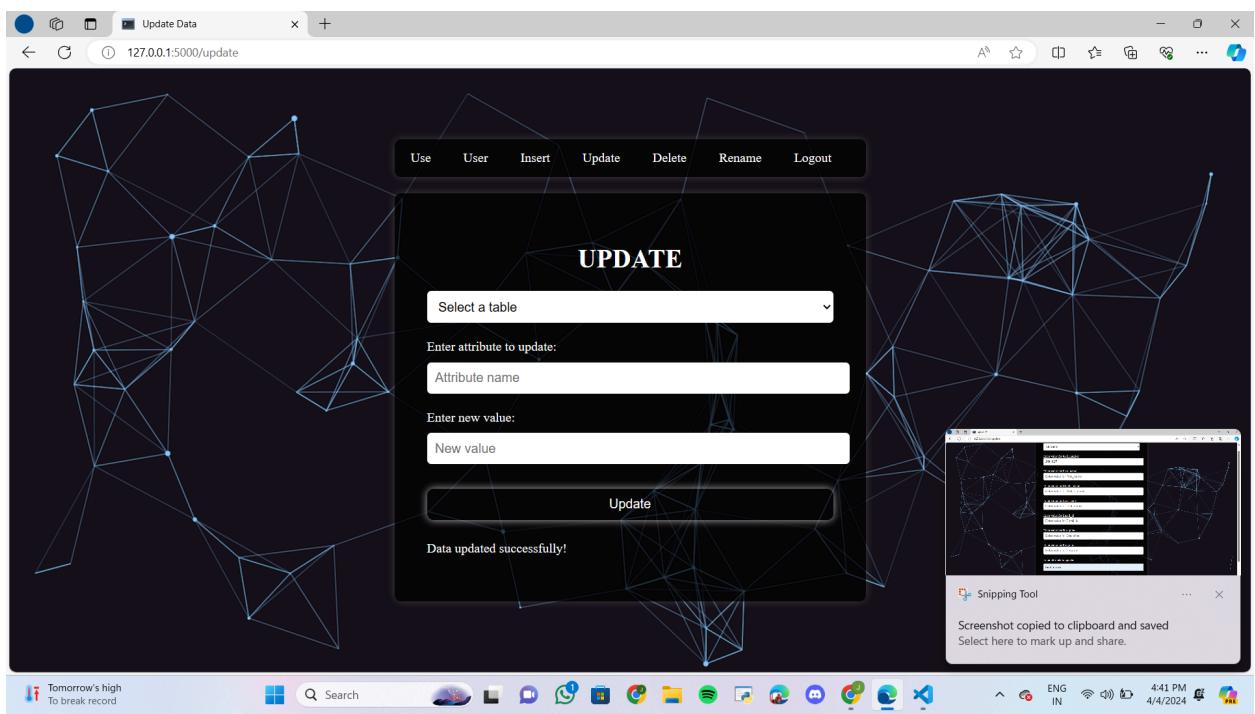
Middle_name

Last_name

Email_id

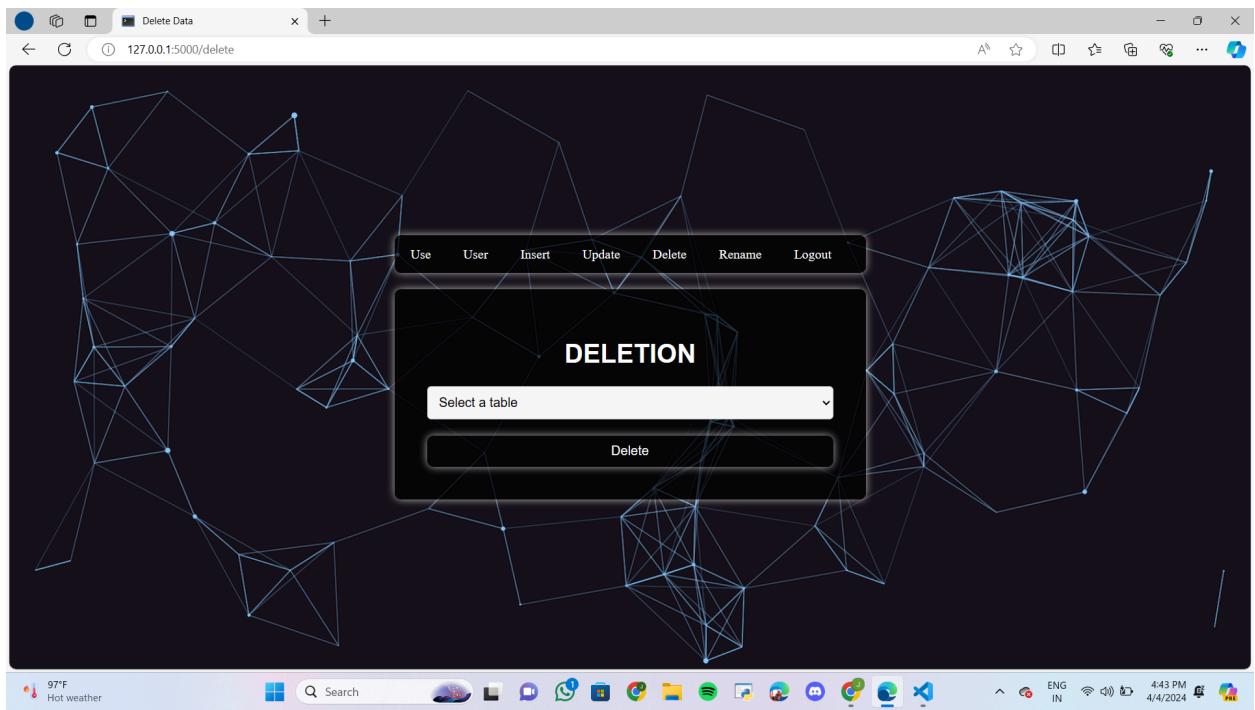
Discipline

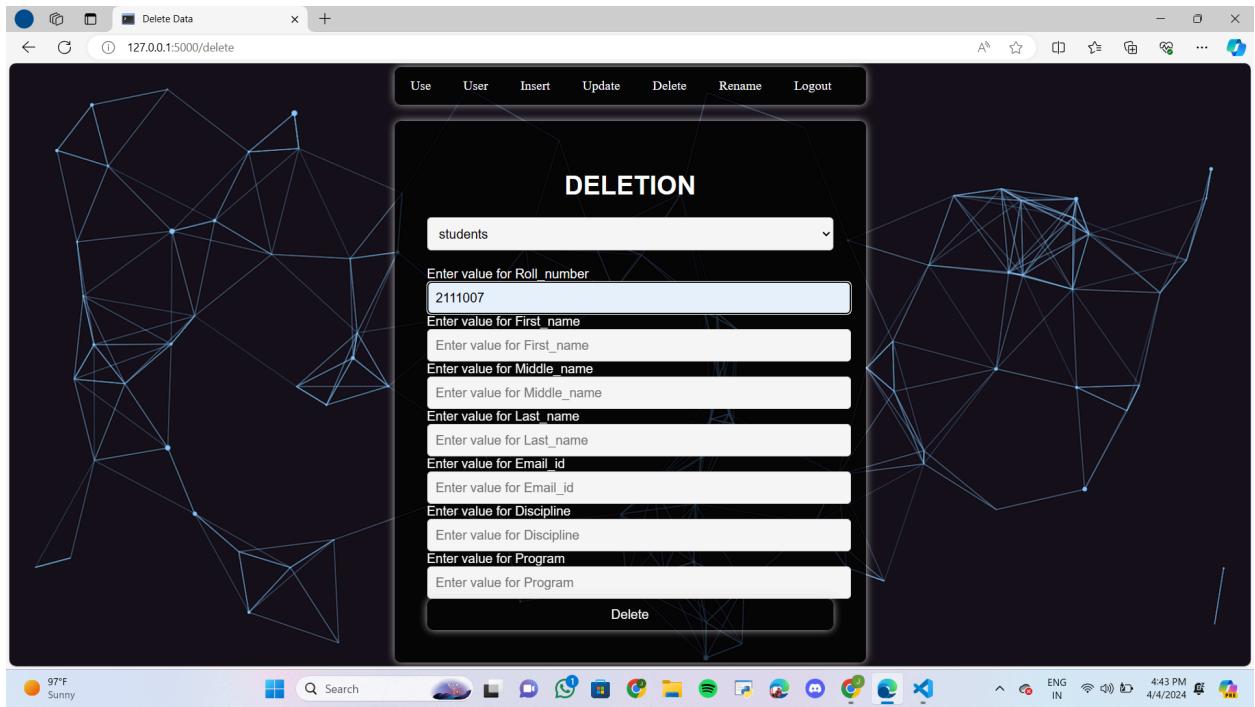
Program



We can see that it's updated in the Students table also 2111007 Jay None K K entry.

Now let us explore the delete page:





We can see that in the table the entry with roll number 2111007 is deleted:

| Roll_number | First_name | Middle_name | Last_name | Email_id | Discipline | Program |
|-------------|------------|-------------|-----------|------------------------------|------------------------------|---------|
| 20110002 | Abhishek | Balaji | Munekar | abhishek.munekar@iitgn.ac.in | Mechanical Engineering | Btech |
| 20110003 | Progyan | Balaji | Das | progyandas@iitgn.ac.in | Computer Science Engineering | Btech |
| 20110004 | Dhairya | Balaji | Shah | shahdhairya@iitgn.ac.in | Computer Science Engineering | Btech |
| 20110005 | Varad | Desh | Seshpande | varadseshpande@iitgn.ac.in | Chemical Engineering | Btech |
| 20110006 | Bhavesh | B | Jain | jainbhavesh@iitgn.ac.in | Computer Science Engineering | Btech |
| 21110089 | JAY | None | JAY | ja@ | B | C |
| 252 | Vinay | Amit | Mappa | mappavinay@iitgn.ac.in | Mechanical Engineering | Btech |

Search

Roll_number

First_name

Middle_name

Last_name

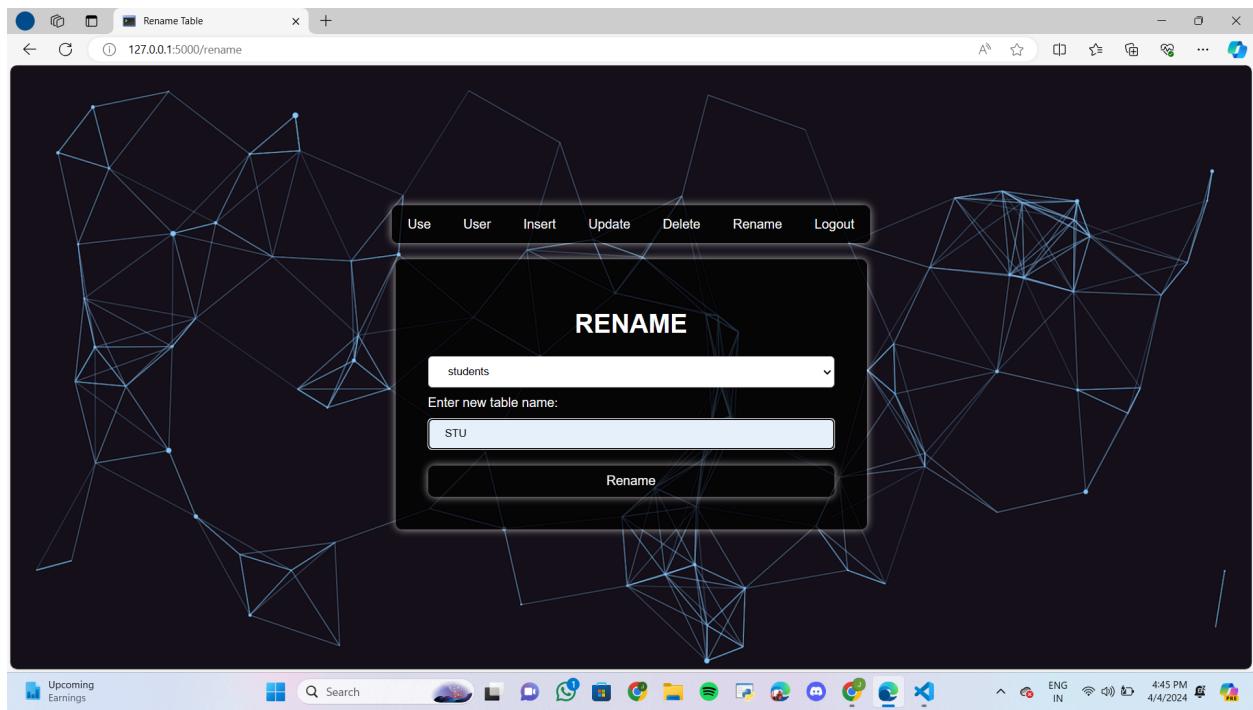
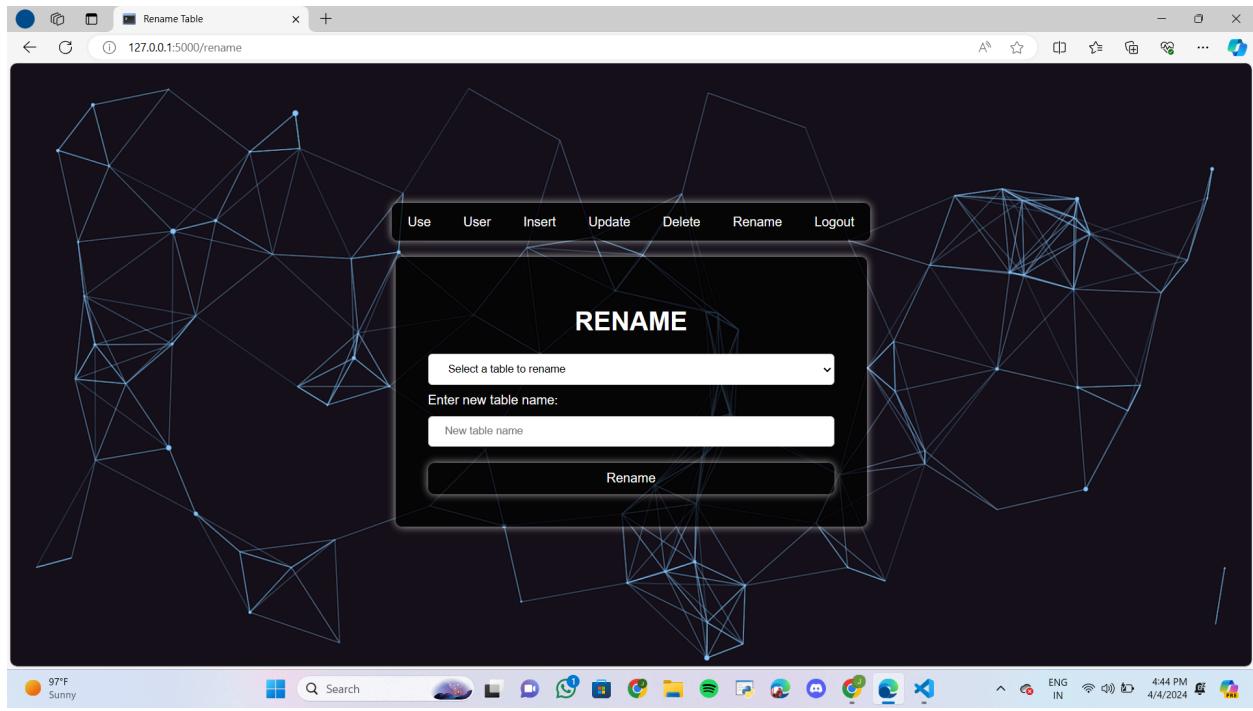
Email_id

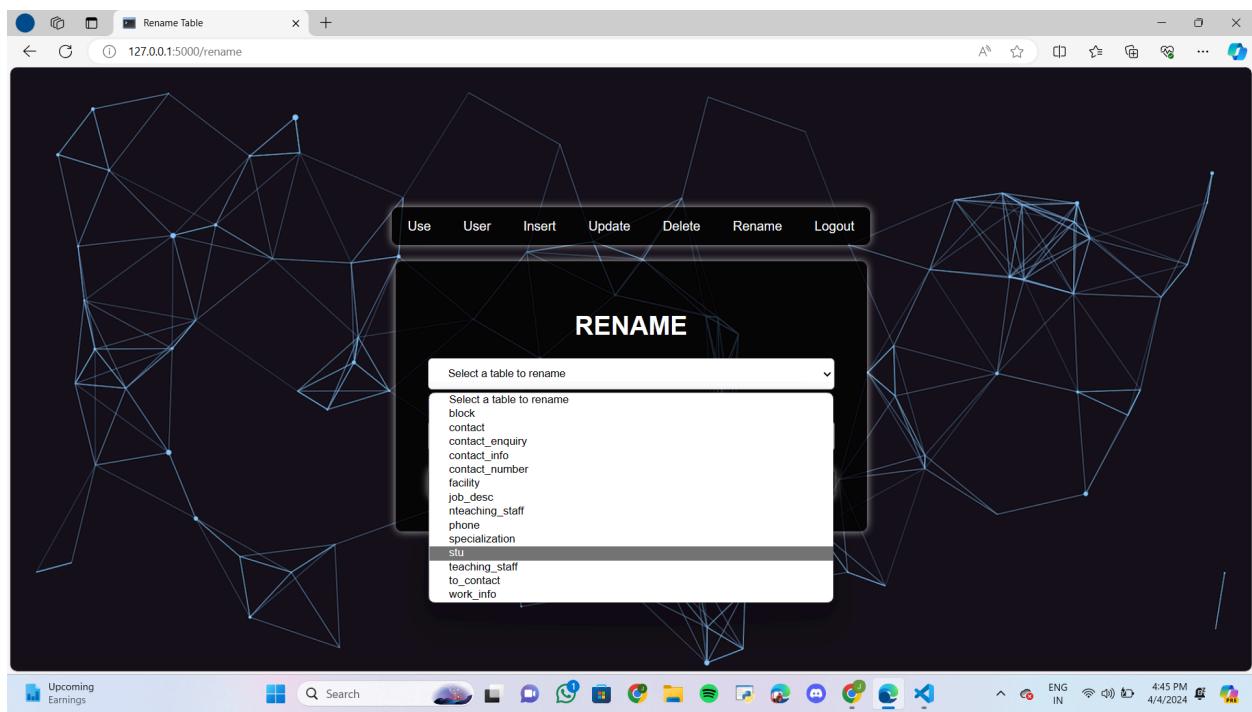
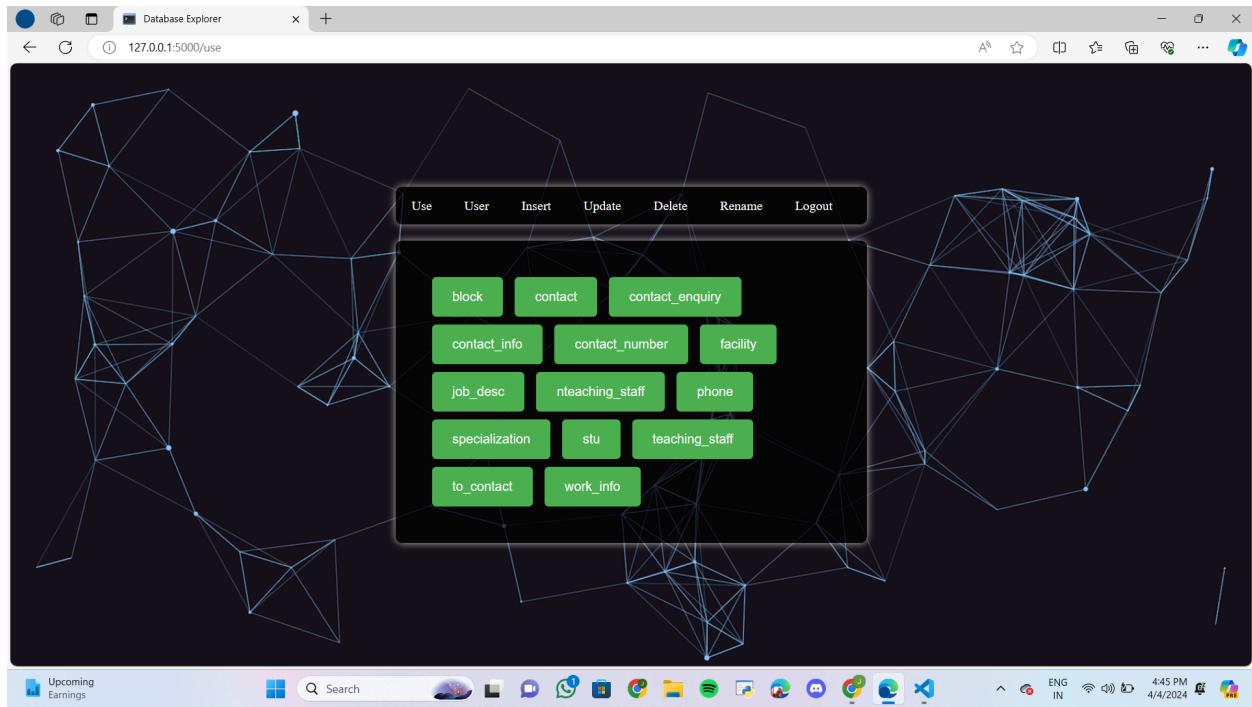
Discipline

Program

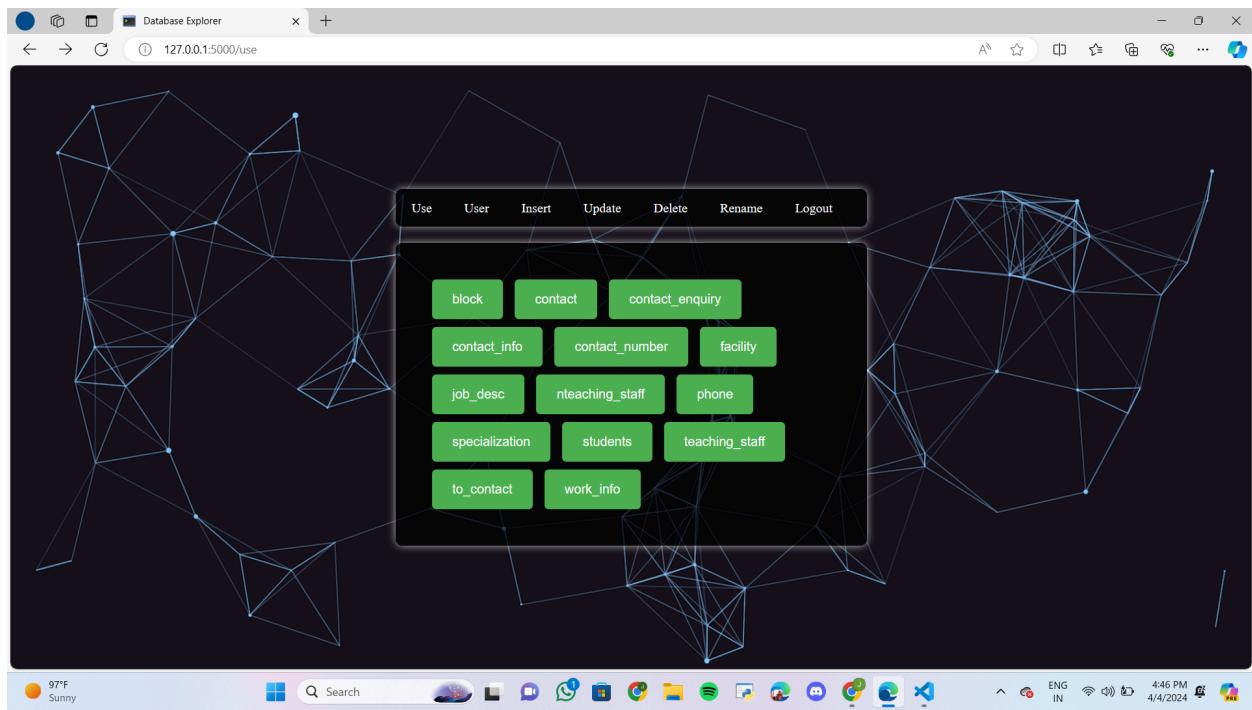
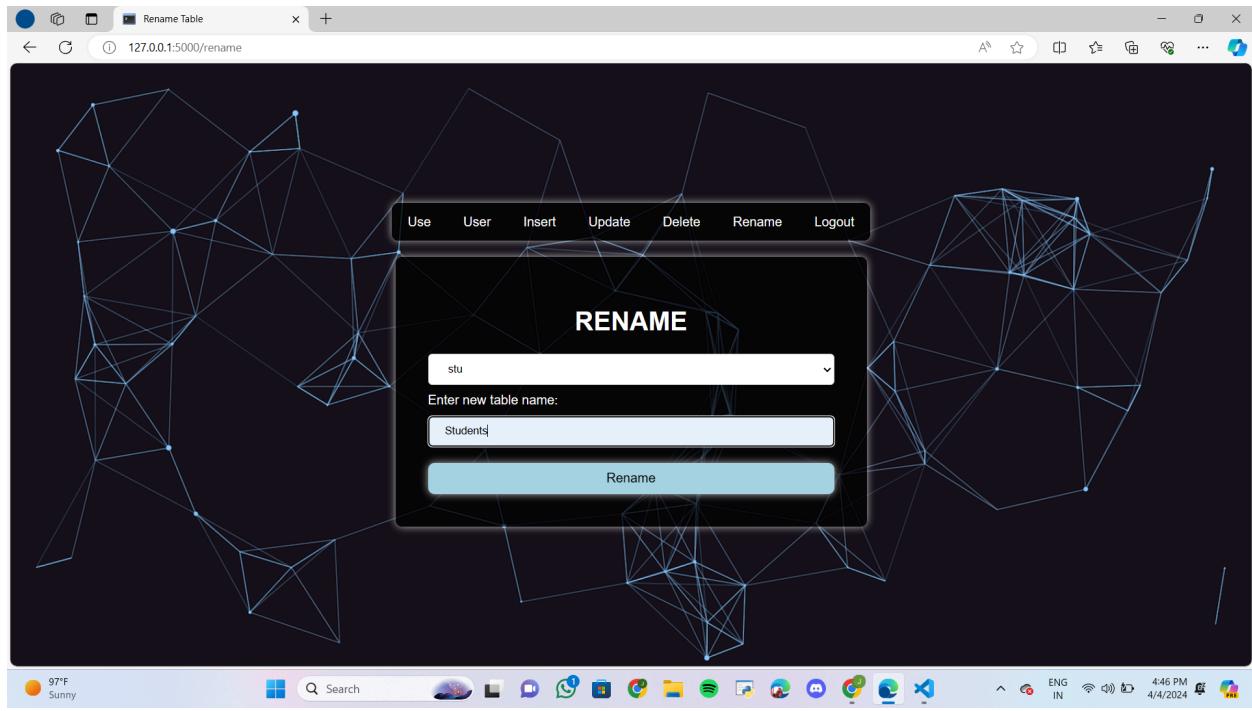
Search

Similarly, for Rename, we are renaming the table name as of now and keeping the foreign key constraints in mind, we will again change it back to its previous name, but in between, we can see it updated on our app at the Use page showing all the tables in the database. Rename table Students to STU.





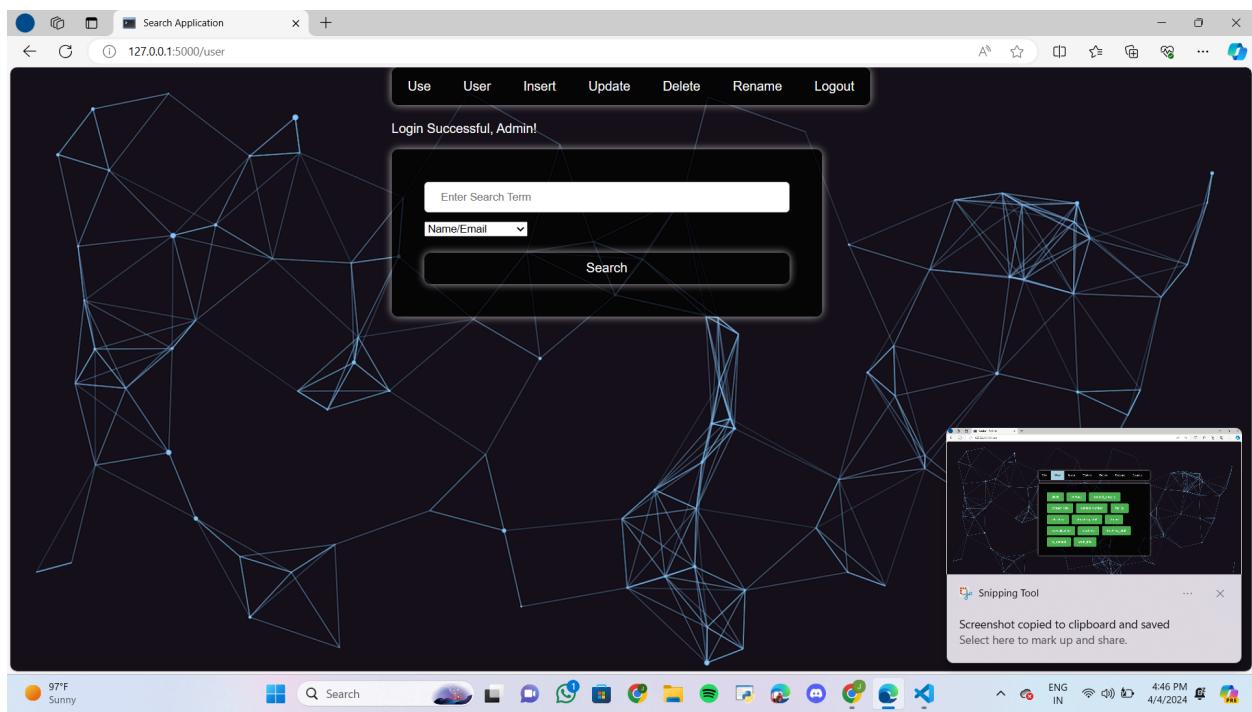
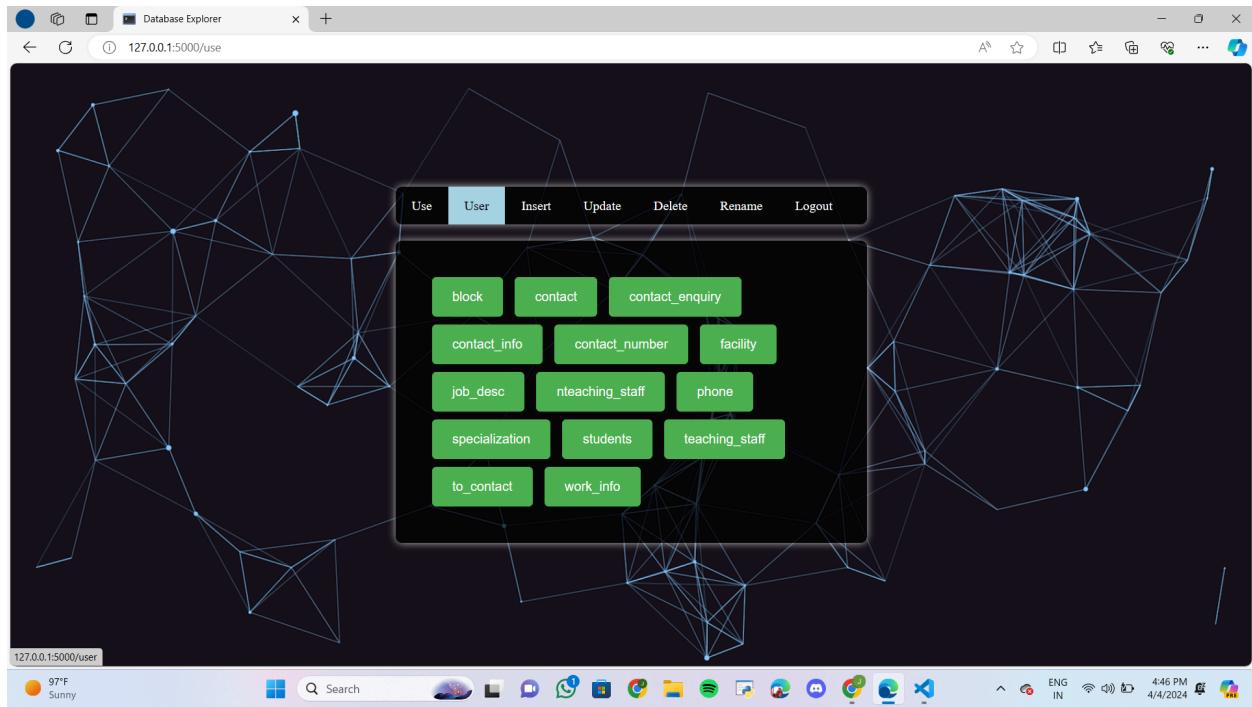
In the above snap, we can see that it is also dynamically updated in the dropdowns.



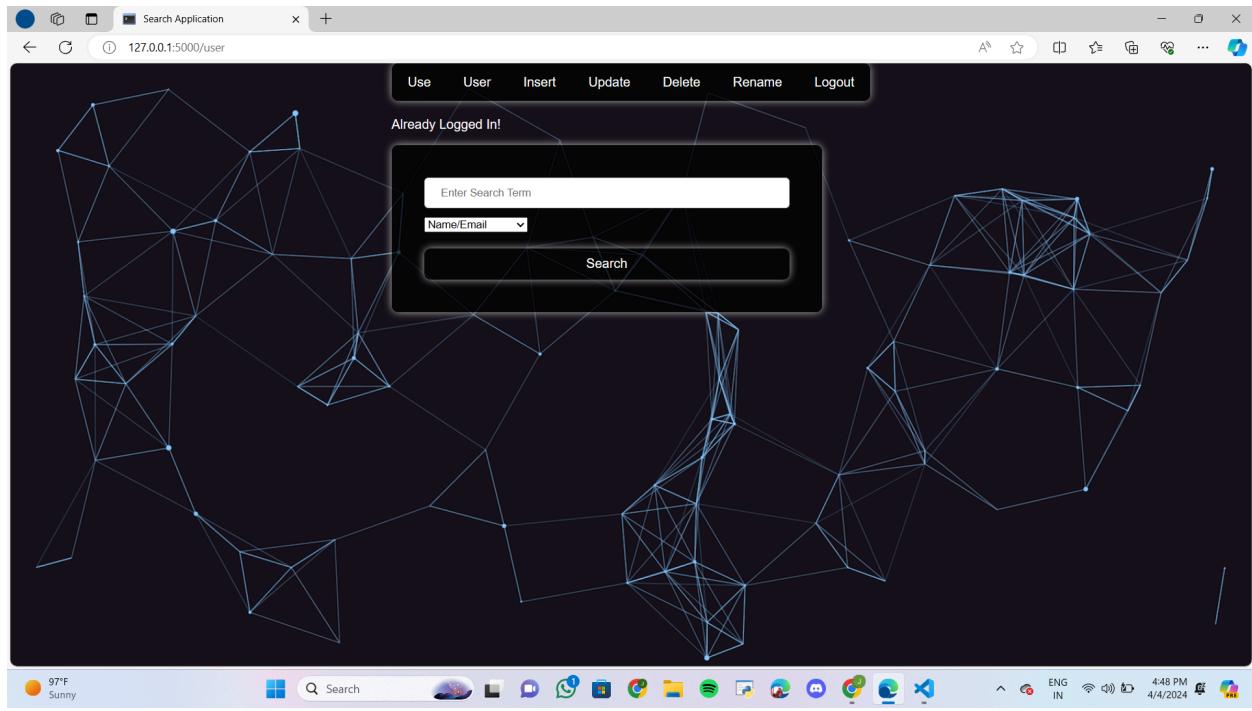
The above is after changing the name back to its original name.

One more point we are using direct original names in the code/app and using joins to fetch data for the table in the User page so when we are doing this we will miss records from the table renamed.

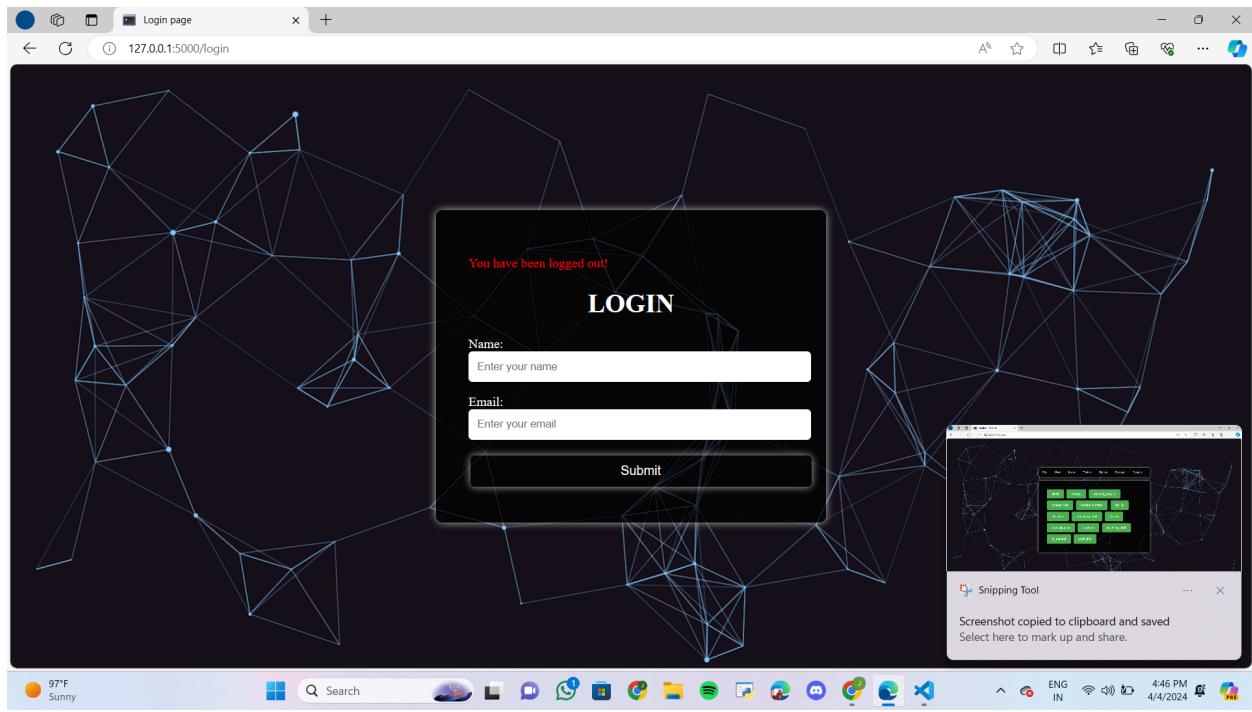
When we try to choose a User page as an admin it will be not different from that of the non administrator one's.



Refresh it to get already logged in as previous this is because we are using sessions for a 5 minute period so that is why this is happening.



Logout page also no difference it will be as below:



As for the Where clause asked we are using it in the User page only while searching by Name/Email or Discipline/Section. The following code is from t2.py and User definition.

```

if search_by == 'Name/Email':
    cur.execute(query + " WHERE Name LIKE %s OR Email LIKE %s ORDER BY Name", (f"%{search_term}%", f"%{search_term}%"))
else: # search_by == 'Discipline/Section'
    cur.execute(query + " WHERE Discipline_Section LIKE %s ORDER BY Name", (f"%{search_term}%",))

data.extend(cur.fetchall())

cur.close()

return render_template('index1.html', data=data)

```

When we go to the Use page as admin we can see all the table names, now when we click a button we will get the picture below. This is when we select the Students table, we will go from the Use page to Usage/table_name page. On the left side we will get the entire table and it is scrollable. In future we could add pagination to these. On the right side we can search that particular table with its attributes.

The screenshot shows a web application interface. At the top, there is a header bar with icons for refresh, back, forward, and search. Below the header, the URL '127.0.0.1:5000/usage/students' is visible. The main content area contains a table with the following data:

| Roll_number | First_name | Middle_name | Last_name | Email_id | Discipline | Program |
|-------------|------------|-------------|-----------|-------------------------------|------------------------------|---------|
| 20110002 | Abhishek | Balaji | Mungekar | abhishek.mungekar@iitgn.ac.in | Mechanical Engineering | Btech |
| 20110003 | Progyan | Balaji | Das | progyandas@iitgn.ac.in | Computer Science Engineering | Btech |
| 20110004 | Dhairya | Balaji | Shah | shahdhairya@iitgn.ac.in | Computer Science Engineering | Btech |
| 20110005 | Varad | Desh | Seshpande | varadseshpande@iitgn.ac.in | Chemical Engineering | Btech |
| 20110006 | Bhavesh | B | Jain | jainbhavesh@iitgn.ac.in | Computer Science Engineering | Btech |
| 21110089 | JAy | None | JAy | ja@ | B | C |
| 252 | Vinay | Amit | Mappa | mappavinay@iitgn.ac.in | Mechanical Engineering | Btech |

To the right of the table is a search sidebar titled 'Search' with fields for Roll_number, First_name, Middle_name, Last_name, Email_id, Discipline, and Program. A green 'Search' button is at the bottom of the sidebar. The browser's status bar at the bottom shows weather information ('94°F Mostly sunny'), a search bar, and system icons.

The screenshot shows a web application interface. On the left, there is a scrollable table titled "teaching_staff" with columns: Faculty_ID, First_name, Middle_name, Last_name, and Email_id. The table contains 23 rows of data. On the right, there is a search sidebar titled "Search" with fields for Faculty_ID, FirstName, MiddleName, LastName, and Email, each with a corresponding input field. A green "Search" button is located at the bottom of the sidebar. The browser's address bar shows the URL "127.0.0.1:5000/usage/teaching_staff". The system tray at the bottom indicates it is 94°F, Mostly sunny, and shows the date and time as 4/4/2024 6:10 PM.

| Faculty_ID | First_name | Middle_name | Last_name | Email_id |
|------------|----------------|---------------|-------------|-----------------------|
| 1011 | First_name_6 | Middle_random | Last_random | email1011@example.com |
| 1012 | First_name_7 | Middle_random | Last_random | email1012@example.com |
| 1013 | First_name_8 | Middle_random | Last_random | email1013@example.com |
| 1014 | First_name_9 | Middle_random | Last_random | email1014@example.com |
| 1015 | First_name_10 | Middle_random | Last_random | email1015@example.com |
| 1016 | First_name_11 | Middle_random | Last_random | email1016@example.com |
| 1017 | First_name_12 | Middle_random | Last_random | email1017@example.com |
| 1018 | First_name_13 | Middle_random | Last_random | email1018@example.com |
| 1019 | First_name_14 | Middle_random | Last_random | email1019@example.com |
| 102 | First_name_101 | Middle_random | Last_random | email102@example.com |
| 1020 | First_name_15 | Middle_random | Last_random | email1020@example.com |
| 1021 | First_name_16 | Middle_random | Last_random | email1021@example.com |
| 1022 | First_name_17 | Middle_random | Last_random | email1022@example.com |
| 1023 | First_name_18 | Middle_random | Last_random | email1023@example.com |

The above picture depicts the scrollable left side table. In the below we will see the working of the search operations in the Students table.

The screenshot shows a web application interface. On the left, there is a scrollable table titled "students" with columns: Roll_number, First_name, Middle_name, Last_name, Email_id, Discipline, and Program. The table contains 8 rows of data. On the right, there is a search sidebar titled "Search" with fields for Roll_number, First_name, Middle_name, Last_name, Email_id, Discipline, and Program, each with a corresponding input field. A green "Search" button is located at the bottom of the sidebar. The browser's address bar shows the URL "127.0.0.1:5000/usage/students". The system tray at the bottom indicates it is 94°F, Sunset, and shows the date and time as 4/4/2024 6:11 PM.

| Roll_number | First_name | Middle_name | Last_name | Email_id | Discipline | Program |
|-------------|------------|-------------|-----------|------------------------------|------------------------------|---------|
| 20110002 | Abhishek | Balaji | Munekar | abhishek.munekar@iitgn.ac.in | Mechanical Engineering | Btech |
| 20110003 | Progyan | Balaji | Das | progyandas@iitgn.ac.in | Computer Science Engineering | Btech |
| 20110004 | Dhairya | Balaji | Shah | shahdhairya@iitgn.ac.in | Computer Science Engineering | Btech |
| 20110005 | Varad | Desh | Seshpande | varadseshpande@iitgn.ac.in | Chemical Engineering | Btech |
| 20110006 | Bhavesh | B | Jain | jainbhavesh@iitgn.ac.in | Computer Science Engineering | Btech |
| 21110089 | JAY | None | JAY | ja@ | B | C |
| 252 | Vinay | Amit | Mappa | mappavinay@iitgn.ac.in | Mechanical Engineering | Btech |

Last_name == "JAy" in Students table will give us:

The screenshot shows a web browser window with a search interface for a database application. The URL is 127.0.0.1:5000/usage/students. The search form on the right has fields for Roll_number, First_name, Middle_name, Last_name, Email_id, Discipline, and Program. Below the form is a table with one row of data:

| Roll_number | First_name | Middle_name | Last_name | Email_id | Discipline | Program |
|-------------|------------|-------------|-----------|----------|------------|---------|
| 21110089 | JAy | None | JAy | ja@ | B | C |

With this all the possible and required operations are done and made in the application.

CONTRIBUTIONS:

Group 1 Members:

Uday Kumar:

- Involved in designing the front-end user interface.
- Contributed innovative ideas and actively participated in group discussions.
- Brainstormed the required information regarding front-end development.
- Assisted in documenting the whole file.

Sujith:

- Contributed to front-end development, focusing on user experience and interface design.
- I also contributed to answering the questions in section 3.3.
- Brainstormed the required information regarding front-end development.
- Assisted the other team members of G2 to complete the responsibility of G1 and G2 (3.3 section).

Ajith:

- Participated in designing front-end elements and user interactions.

- Assisted the teammates of G2 with the final draft of the responsibility of the G2 section.
- Assisted in drafting the whole document.

Keerthi:

- Contributed to front-end development, focusing on user experience and interface design
- Assisted the other team members of G1 to complete the responsibility of G1 and G2 (3.3 section).
- Actively engaged in the responsibility of G1 and provided creative and original ideas.
- Assisted in completing tasks related to G1 and G2 responsibilities.

Pardheev Sai:

- Contributed to front-end development using Html and CSS.
- Assisted the other team members of G1.

Group 2 Members:

Jethru:

- Guided and motivated the whole team from the beginning to the end of the assignment.
- Worked on the back-end development, integrating MySQL into the WebApp.
- Actively engaged in the responsibility of G2 and provided creative and original ideas.
- Made sure that every team member gets enough to work on.

Sudharshan:

- I worked on the back-end development and performed the update, delete, and rename operations.
- Actively engaged in the responsibility of G2 and provided creative and original ideas.
- Assisted the other team members in completing the responsibility of G1 and G2 (3.3 section).
- Assisted in documenting the whole file.

Vinay Marka:

- Contributed to the back-end development, integrating MySQL into WebApp.
- Engaged in brainstorming sessions to determine the essential information needed.
- I also contributed to answering the last section 3.3.
- Assisted in documenting the whole file.

Hima Sagar:

- I worked on the back-end development, primarily performing the update, delete, and rename operations.
- Assisted the other team members in completing the responsibility of G1 and G2 (3.3 section).
- Also assisted in documenting the responsibility of the G1 and G2 sections.
- Assisted the teammates in documenting the whole file.

Rudreshwar:

- Worked on the back-end development, integrating MySQL into the WebApp.
- Assisted in completing tasks related to G1 and G2 responsibilities.
- Participated in discussions to ensure all necessary information was identified and included.
- Responsible for answering the last section.

In our team, we ensured each person had a fair share in the project, showing our commitment to fairness and collaboration. Whether in Group 1 or Group 2, everyone played their part, ensuring that our collective effort led to a fruitful outcome.