

CSE_236 WEB DEVELOPMENT FINAL PROJECT REPORT FOR HOME AUTOMATION SYSTEMS

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Done: Backend and database, Majorly
Project's github page: <https://github.com/electus-1/home-automation-project>

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Done: Styling and CSS, Majorly

To login Use these parameters please:

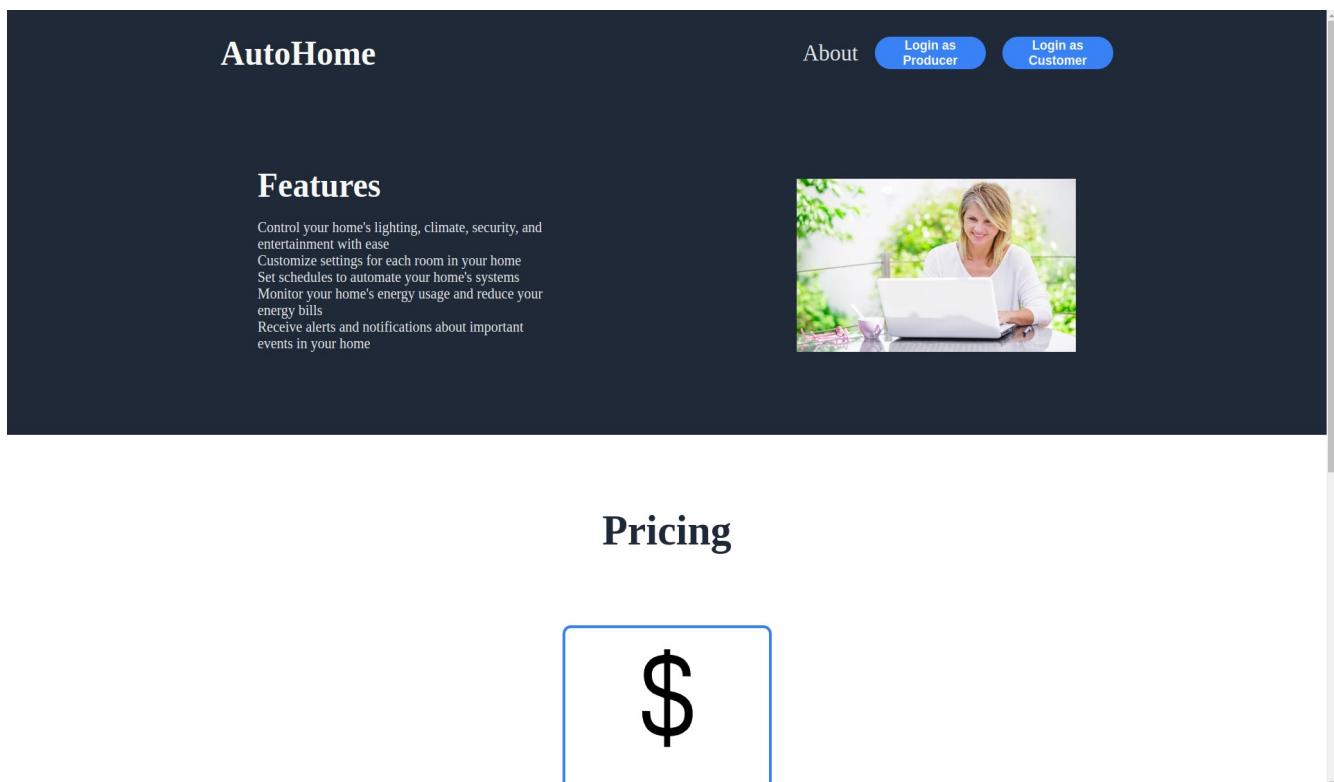
producer email: b@gmail.com
producer password: 123

consumer email: a@gmail.com
consumer password: 1234

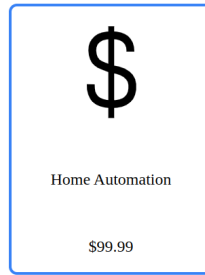
A) SCREENSHOTS

1) Landingpage:

- There are 2 different buttons for login. One for the customer another one for the producer.



Pricing

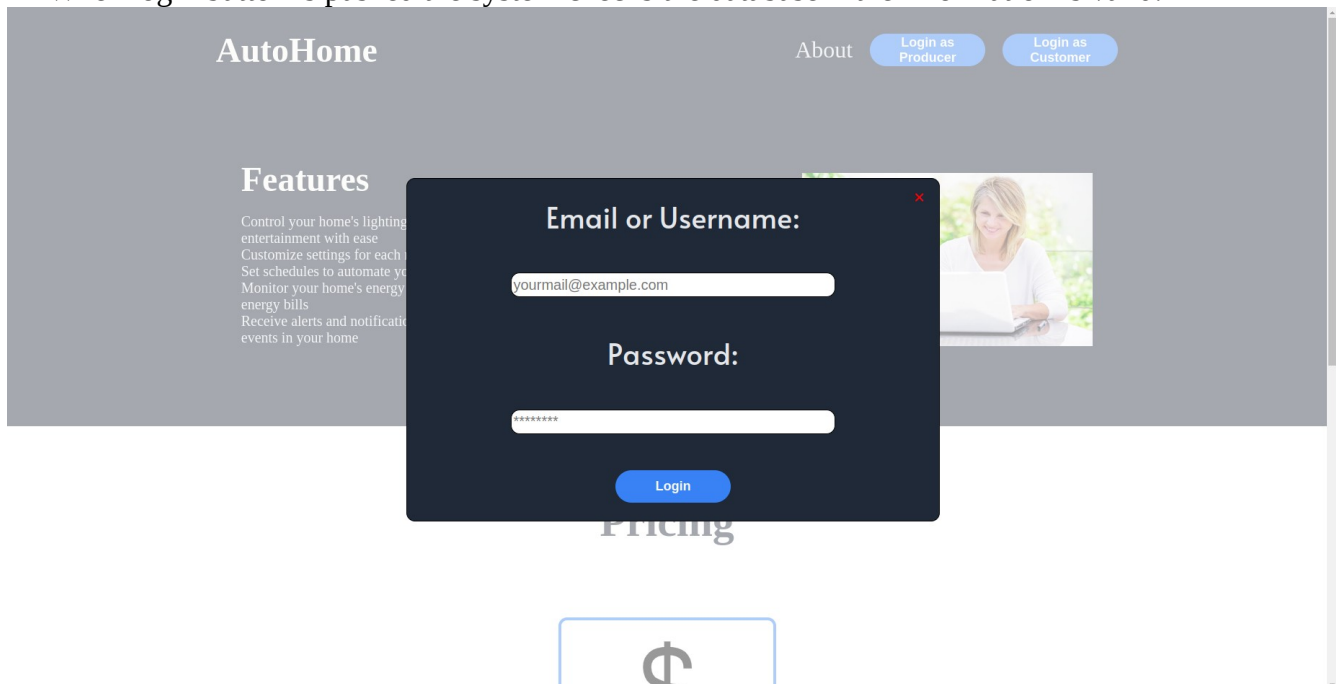


SOMETIMES WE MAKE THE PROCESS MORE COMPLICATED THAN WE NEED TO. WE WILL NEVER MAKE A JOURNEY OF A THOUSAND MILES BY FRETTING ABOUT HOW LONG IT WILL TAKE OR HOW HARD IT WILL BE. WE MAKE THE JOURNEY BY TAKING EACH DAY STEP BY STEP AND THEN REPEATING IT AGAIN AND AGAIN UNTIL WE REACH OUR DESTINATION.

-Joseph B. Wirthlin

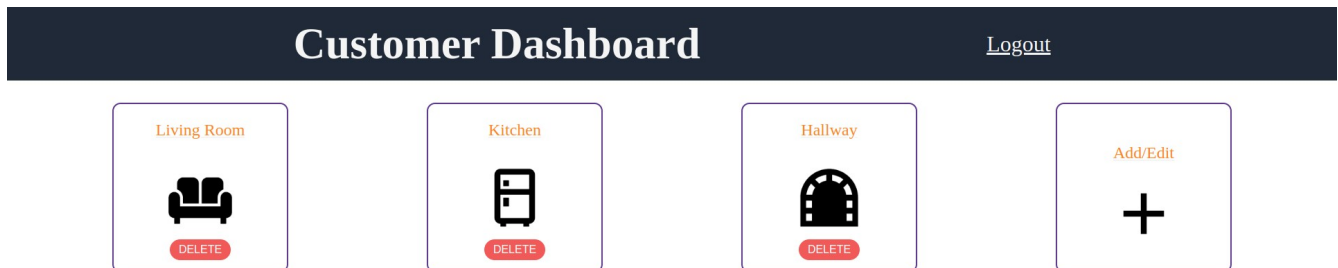
2) Login:

- Both producer and consumer have the same UI for login.
- A proper email is required to login
- Password is not shown to the user during login
- When login button is pushed the system checks the database if the information is valid.



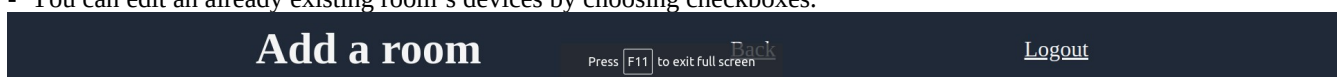
3) Customer Dashboard:

- The page the customer sees after logging in.
- Here is shown all the rooms an user has, a button to delete them and a card to edit or add a room.
- You can change the devices in a room from add/edit.
- It uses the same .php file to show different customer's rooms.
- There is a Logout button for logging out



4) Add A Room

- You can add a room and choose the devices in that room from the checkboxes.
- There is a total of 6 rooms and 8 devices you can choose from.
- You can edit an already existing room's devices by choosing checkboxes.



Room type: Kitchen

Choose Devices:

Light Sensor

Light Color Sensor

Temperature Capturer

Sound System

Security System

Door Locking Mechanism

Roomba Cleaner

Water Heating System

Add


5)Customer Room

- You can see and change the state of a device by choosing a state and then clicking the buttons.
- You can go back to the previous page by clicking the back button.
- You can see the past time's data by clicking the Device Info page.
- You can logout from the system.

Livingroom

Device InfoBackLogout


LIGHTS



OFF

TURN ON

LIGHT COLOR




RED

RED

APPLY CHANGES

ROOM TEMPERATURE




0

8

START AIR CONDITIONER


SOUND SYSTEM



OFF

TURN ON


SECURITY



LOW

LOW

ROOBMA



CHARGING

6) Device Info

- You can see the previous states of all the devices and the numbers of them.
- You can go back to the previous page or logout.

Device Livingroom1 Press F11 to exit full screenBackLogout								
Number	Light System	Light Color	Temperature (°C)	Sound System	Security System	Lock	Roomba	Water Heater
1	ON	green	25	ON	No device found	No device found	Charging	OFF
2	ON	red	25	ON	No device found	No device found	Charging	OFF
3	ON	red	25	ON	No device found	No device found	Charging	OFF
4	ON	red	25	OFF	No device found	No device found	Charging	OFF
5	ON	red	8	OFF	No device found	No device found	Charging	OFF
6	ON	red	8	OFF	No device found	No device found	Charging	OFF
7	ON	red	8	OFF	No device found	No device found	Charging	OFF
8	ON	red	8	OFF	No device found	No device found	Charging	OFF
9	ON	red	8	OFF	No device found	No device found	Charging	OFF
10	ON	red	8	OFF	No device found	No device found	Charging	OFF
11	ON	red	8	OFF	No device found	No device found	Charging	OFF
12	ON	red	8	OFF	No device found	No device found	Charging	OFF
13	ON	blue	8	OFF	No device found	No device found	Charging	OFF
14	OFF	blue	8	OFF	No device found	No device found	Charging	OFF
15	ON	blue	8	OFF	No device found	No device found	Charging	OFF
16	OFF	blue	8	OFF	No device found	No device found	Charging	OFF
17	OFF	No device found	0	No device found	No device found	No device found	No device found	No device found
18	OFF	red	0	No device found	No device found	No device found	No device found	No device found
19	OFF	red	0	No device found	No device found	No device found	No device found	No device found
20	ON	red	0	No device found	No device found	No device found	No device found	No device found
21	ON	red	8	No device found	No device found	No device found	No device found	No device found
22	OFF	No device found	0	OFF	No device found	No device found	Charging	OFF
23	OFF	red	0	OFF	No device found	No device found	Charging	OFF

7) Producer Entry

- The page the producer sees after logging in.
- He can see all the customers information and chose a customer to view their system.


Producer Dashboard Press F11 to exit full screen [Logout](#)


Email	Password	Select
a@gmail.com	1234	Select
c@gmail.com	1234	Select


8) Producer's Customer Room View

- After choosing a customer from the producer entry page you can see the customer's system.
- You can go back to the previous page by clicking back.
- By clicking a room you can see the devices the customer has.

a@gmail.com's Dashboard [Back](#) [Logout](#)

Living Room


Kitchen


Hallway


9) Producer's Customer Room View

- You can observe the states of the customer's devices inside a room.
- By clicking the device info you can see the information about the previous states of devices.
- In device info the most recent data can be found in the last row of the table.


Hallway

Device Info
Press F11 to exit full screen

Back


Logout

LIGHTS




ON

LIGHT COLOR




RED

ROOM TEMPERATURE




8

SECURITY



OFF

DOOR LOCK

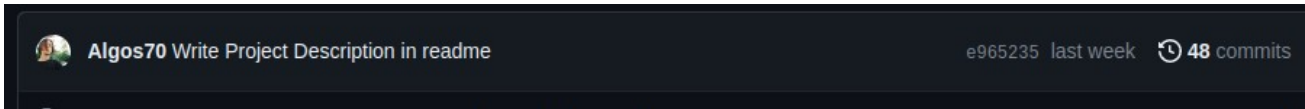


OPEN

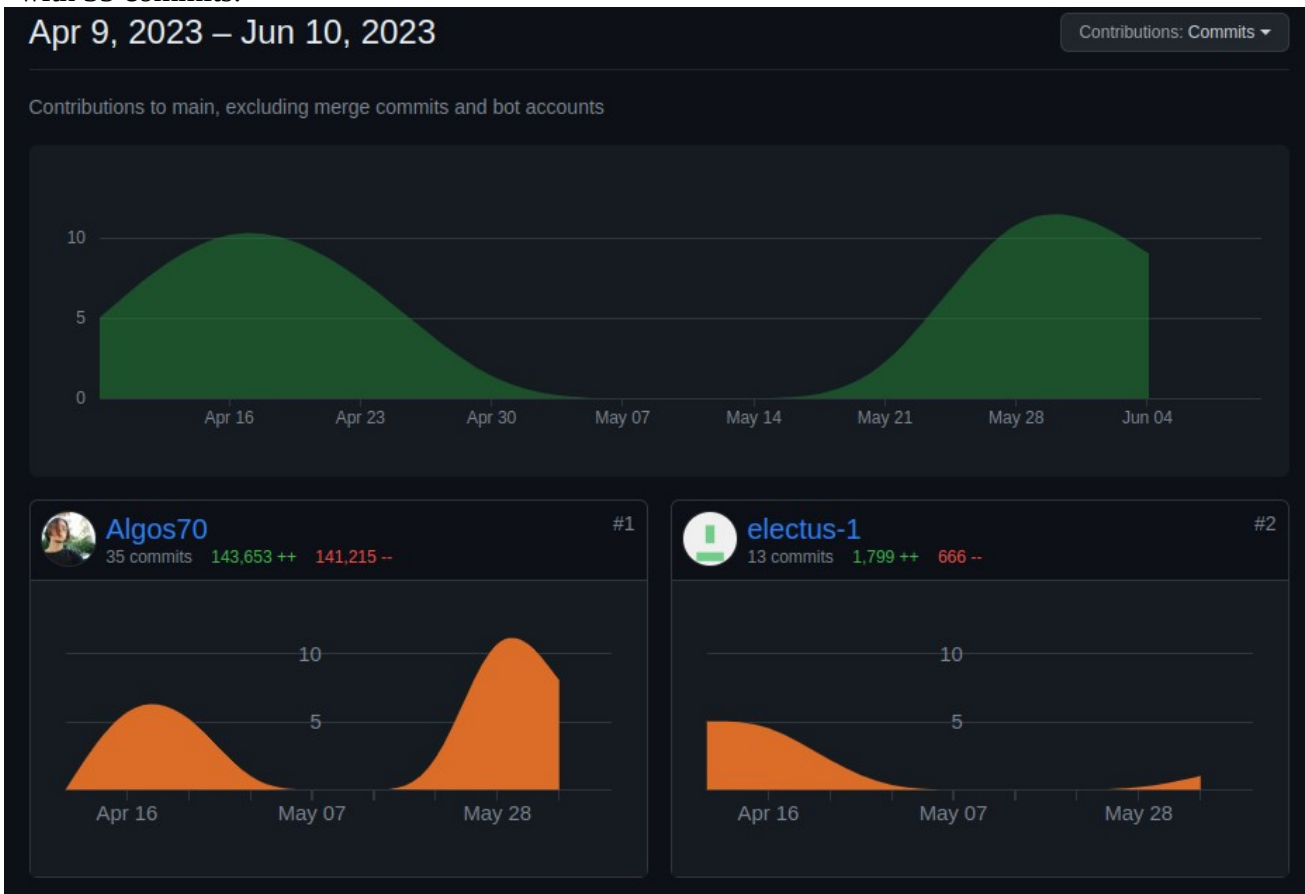
Device Hallway								
Press F11 to exit full screen								
Back								
Logout								
Number	Light System	Light Color	Temperature (°C)	Sound System	Security System	Lock	Roomba	Water Heater
1	ON	green	25	No device found	off	ON	No device found	No device found
2	ON	green	25	No device found	off	OFF	No device found	No device found
3	ON	green	25	No device found	off	ON	No device found	No device found
4	ON	red	25	No device found	off	ON	No device found	No device found
5	ON	red	8	No device found	off	ON	No device found	No device found
6	ON	red	8	No device found	high	ON	No device found	No device found
7	ON	red	8	No device found	low	ON	No device found	No device found
8	ON	red	8	No device found	off	ON	No device found	No device found
9	ON	red	8	No device found	high	ON	No device found	No device found
10	ON	red	8	No device found	high	OFF	No device found	No device found
11	ON	red	8	No device found	high	OFF	No device found	No device found
12	OFF	red	8	No device found	high	OFF	No device found	No device found
13	ON	red	8	No device found	high	OFF	No device found	No device found
14	ON	red	8	No device found	low	OFF	No device found	No device found
15	ON	red	8	No device found	off	OFF	No device found	No device found
16	ON	red	8	No device found	low	OFF	No device found	No device found
17	ON	red	8	No device found	off	OFF	No device found	No device found
18	ON	red	8	No device found	off	OFF	No device found	No device found
19	OFF	red	8	No device found	off	OFF	No device found	No device found
20	ON	red	8	No device found	off	OFF	No device found	No device found
21	OFF	red	8	No device found	off	OFF	No device found	No device found
22	ON	red	8	No device found	off	OFF	No device found	No device found
23	OFF	red	8	No device found	off	OFF	No device found	No device found

B) GIT SECTION

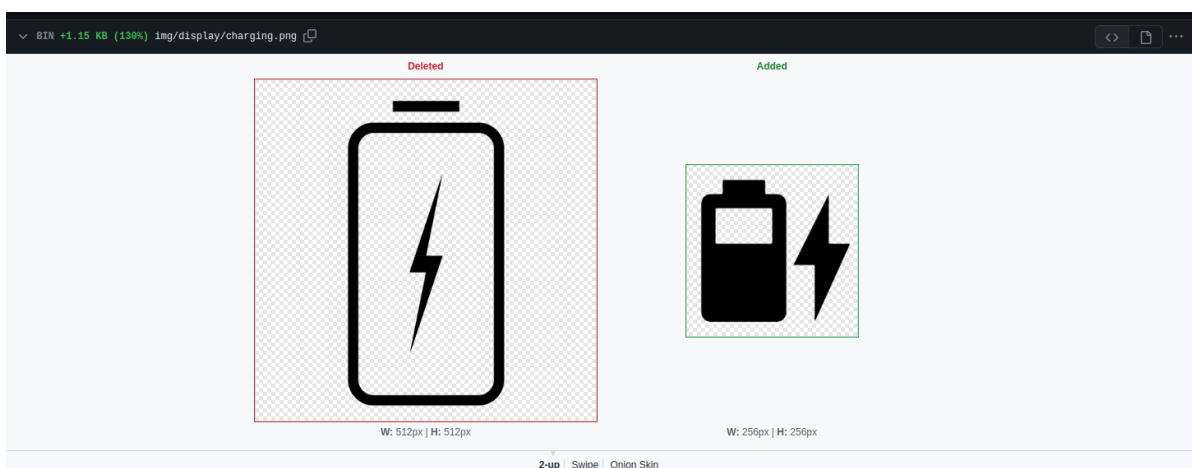
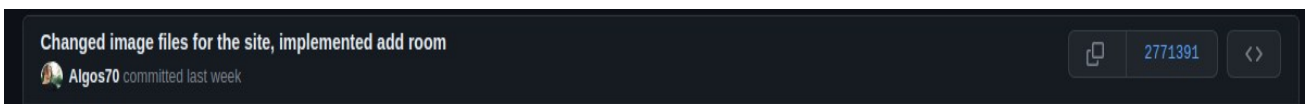
There is a total of 48 git commits in our current directory.
We used git via terminal, and we built the entire site using linux systems.



Here is the total contributions of our team.
The 143k lines are there because we tried to build our database using firebase but then decided against it and deleted all the related files. But still Algos70 has more than 3 thousand lines committed with 35 commits.



And here are some commit examples.



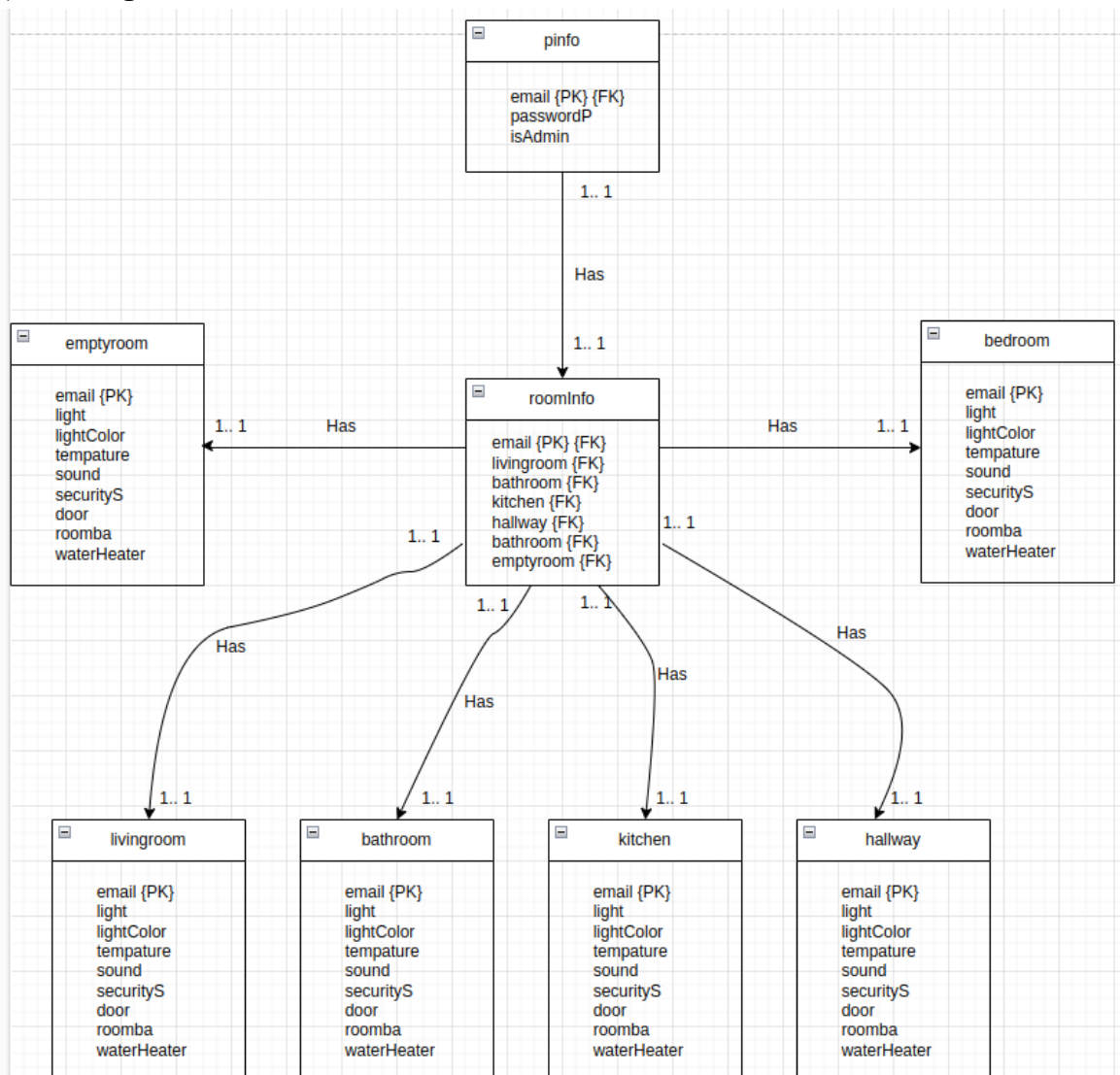
```
135 instance/add_room.php
...
1 + <?php
2 + $email = $_GET['variable'];
3 + $conn = mysqli_connect('localhost', 'algos', '123456', 'dbtest');
4 +
5 + //write query for all infos
6 + $sql = "SELECT email, kitchen, livingroom, hallway, bathroom, bedroom, emptyroom FROM userInfo WHERE email = '$email'";
7 +
8 + //make query and get result
9 + $result = mysqli_query($conn, $sql);
10 +
11 + //fetch the resulting rows as an array
12 + $infos = mysqli_fetch_all($result, MYSQLI_ASSOC);
13 +
14 + //frees result from memory for good practice
15 + mysqli_free_result($result);
16 +
17 + $last = count($infos) - 1;
18 + $light = $infos[$last]['light'];
19 + $color = $infos[$last]['lightColor'];
20 + $lightColor = $infos[$last]['lightColor'];
21 + $sound = $infos[$last]['sound'];
22 + $door = $infos[$last]['door'];
23 + $securityS = $infos[$last]['securityS'];
24 + $roomba = $infos[$last]['roomba'];
25 + $waterHeater = $infos[$last]['waterHeater'];
26 + $temperature = $infos[$last]['temperature'];
27 +
```

Finished producer's backend, added dynamic room viewing to customer
Algos70 committed last week

style buttons, tables, cards, change font size and colors
electus-1 committed last week

Add table device section
Algos70 committed last week

C) ER Diagram



pinfo: Represents accounts of our users, it stores email, password and a boolean field of isAdmin so that our system can differentiate whether the account is admin or not. One pinfo can have one and only one roominfo.

roominfo: Represents with rooms an user has, it stores email as a varchar and 6 rooms as a boolean variable, if an user has a type of room that room's value is assigned as TRUE else FALSE .One roominfo can have one and only one emtyroom. One roominfo can have one and only one bedroom. One roominfo can have one and only one livingroom. One roominfo can have one and only one bathroom. One roominfo can have one and only one kitchen. One roominfo can have one and only one hallway.

emtyroom: Represents an empty room in the house and all the devices that room can contain, if a device is present in a room that device is assigned TRUE value. An empty room can have one and only one roominfo.

bedroom: Represents a bedroom in the house and all the devices that room can contain, if a device is present in a room that device is assigned TRUE value. A bedroom can have one and only one roominfo.

livingroom: Represents a living room in the house and all the devices that room can contain, if a device is present in a room that device is assigned TRUE value. A livingroom can have one and only one roominfo.

bathroom: Represents a bathroom in the house and all the devices that room can contain, if a device is present in a room that device is assigned TRUE value. A bathroom can have one and only one roominfo.

kitchen: Represents a kitchen in the house and all the devices that room can contain, if a device is present in a room that device is assigned TRUE value. A kitchen can have one and only one roominfo.

hallway: Represents a hallway in the house and all the devices a hallway can contain, if a device is present in a hallway that device is assigned TRUE value. A hallway can have one and only one roominfo.

D) Security

When getting email and password from the database we used filter_var function to secure our data.

```
$email = filter_var($_POST['email'], FILTER_SANITIZE_FULL_SPECIAL_CHARS);  
$password = filter_var($_POST['password'], FILTER_SANITIZE_FULL_SPECIAL_CHARS);
```

When updating the database we used mysqli function.

```
$new_value = mysqli_real_escape_string($conn, $val);
```

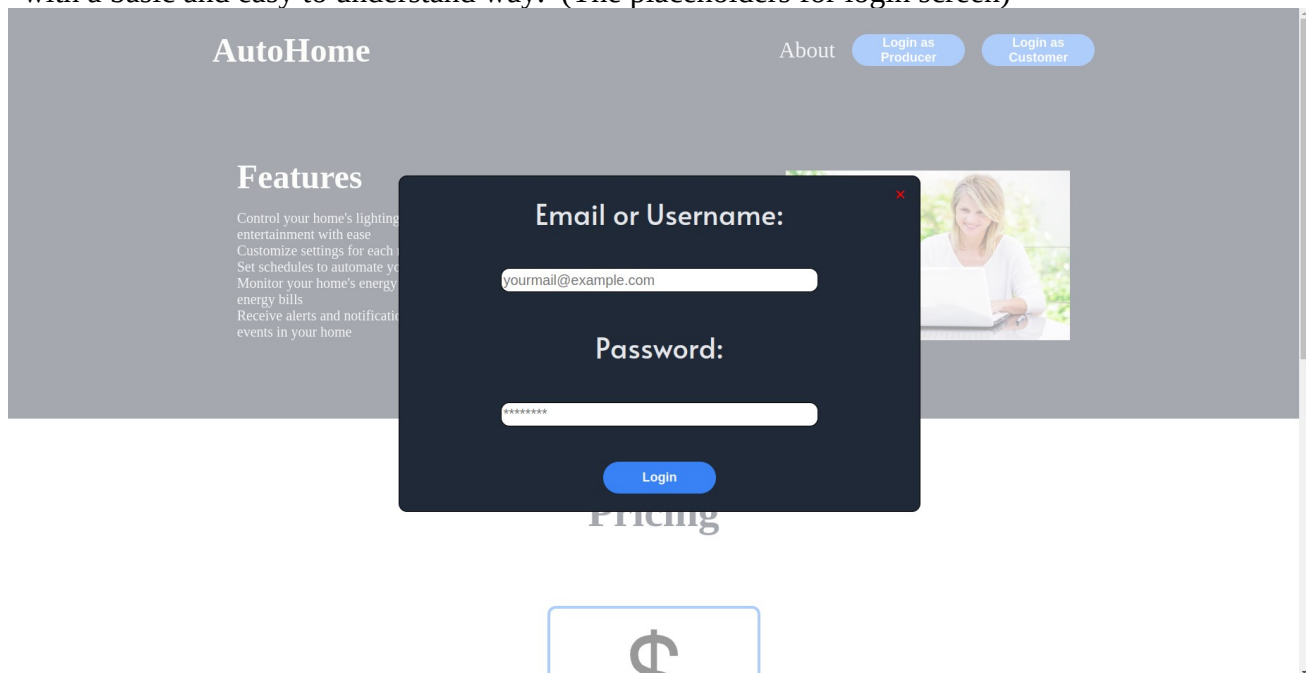
We stored our data in a local database instead of storing them in a txt or other file format with the rest of our codes.

E) UI principles

1) Our UI is consistent. It uses the same color and styling schema for all the pages (For samples you can check the A section of our report at page 1 to 6)

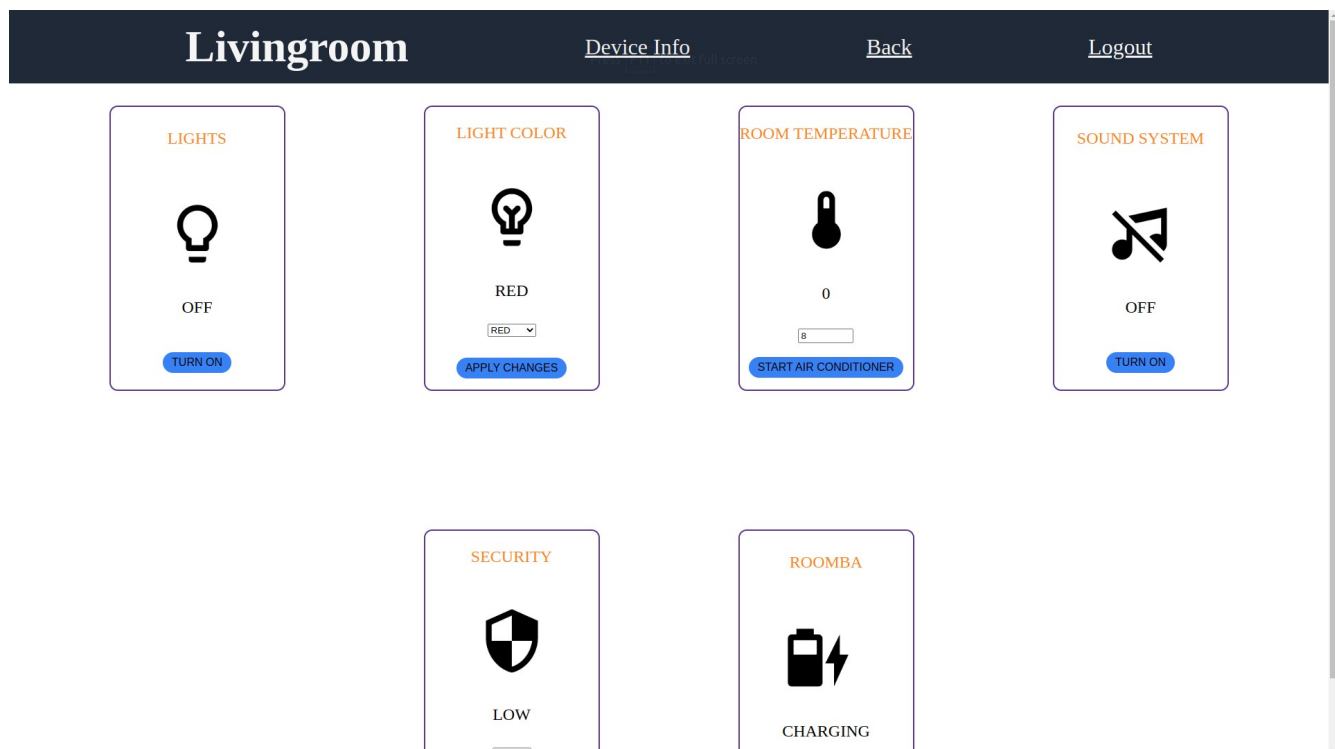
2) Clarity

There is little to no elements in our system that will create confusion for our users. We designed it with a basic and easy to understand way. (The placeholders for login screen)



3) Familiarity

We used already existing and widely used websites as an example for our system. So there is no confusion for our users when using our system. (The menu is on the top of the screen for easy access and the buttons are looking attractive so the user can notice them)



4) User control

Our users can easily go back a page or logout from any page they enter through the ‘Back’ and ‘Logout’ section which they can find them on the menu at the top of the screen.

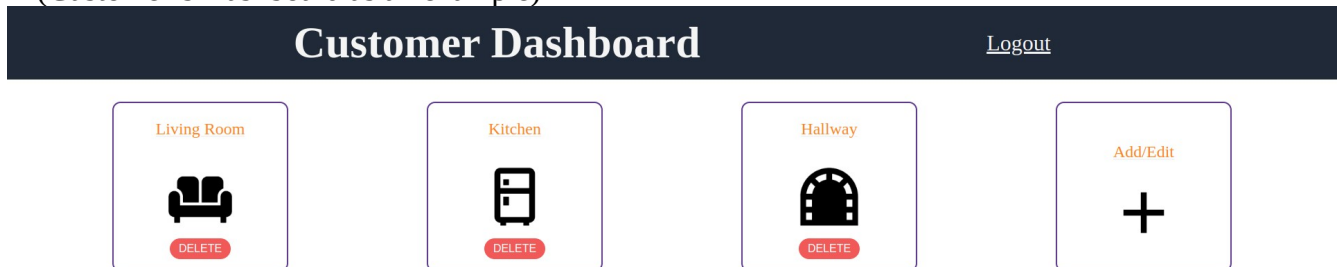
(As an example our device info page)

Device Livingroom1 <small>Press F11 to exit full screen</small> Back Logout								
Number	Light System	Light Color	Temperature (°C)	Sound System	Security System	Lock	Roomba	Water Heater
1	ON	green	25	ON	No device found	No device found	Charging	OFF
2	ON	red	25	ON	No device found	No device found	Charging	OFF
3	ON	red	25	ON	No device found	No device found	Charging	OFF
4	ON	red	25	OFF	No device found	No device found	Charging	OFF
5	ON	red	8	OFF	No device found	No device found	Charging	OFF
6	ON	red	8	OFF	No device found	No device found	Charging	OFF
7	ON	red	8	OFF	No device found	No device found	Charging	OFF
8	ON	red	8	OFF	No device found	No device found	Charging	OFF
9	ON	red	8	OFF	No device found	No device found	Charging	OFF
10	ON	red	8	OFF	No device found	No device found	Charging	OFF
11	ON	red	8	OFF	No device found	No device found	Charging	OFF
12	ON	red	8	OFF	No device found	No device found	Charging	OFF
13	ON	blue	8	OFF	No device found	No device found	Charging	OFF
14	OFF	blue	8	OFF	No device found	No device found	Charging	OFF
15	ON	blue	8	OFF	No device found	No device found	Charging	OFF
16	OFF	blue	8	OFF	No device found	No device found	Charging	OFF
17	OFF	No device found	0	No device found	No device found	No device found	No device found	No device found
18	OFF	red	0	No device found	No device found	No device found	No device found	No device found
19	OFF	red	0	No device found	No device found	No device found	No device found	No device found
20	ON	red	0	No device found	No device found	No device found	No device found	No device found
21	ON	red	8	No device found	No device found	No device found	No device found	No device found
22	OFF	No device found	0	OFF	No device found	No device found	Charging	OFF
23	OFF	red	0	OFF	No device found	No device found	Charging	OFF

5) Hierarchy

Our system has a consistent style for all pages and that style is designed so that it explains the level of importance of each element and guide users to take the desired action.

(Customer’s Dashboard as an example)



F) Third party feedback

We asked a fellow classmate of ours to use our system and give us a feedback. The results as follows:

Minus:

He said he found the font style of the web site a bit too harsh to the eye and wanted us to change it to something else.

He found the padding of our buttons a bit too little and said they could be a bit bigger.

He found the landing page a bit too basic but he said he likes it a bit more complex and robust.

Plus:

He really liked our system for adding a room and that rooms devices. He said it was really simple and easy to understand.

He liked how he can see the past states of the devices in each room and said this makes the system a bit more attractive for him.

Aside from these he said he pretty much liked the system, and said he could see himself using this system in his own home for some basic devices that he owns.

G) Workflows

-To open the Customer Dashboard

- 1) Open the landing page
- 2) Click the customer login button
- 3) Enter the customer's e-mail and password

-When you already have Access to customer dashboard you can:

- 1) Choose a room to see their devices
- 2) Delete an already existing room
- 3) Add or edit a room by clicking add/edit card

*You can only have one room per room type and if you select an already existing room you can change which devices that room is containing.

*You can have one device sensor per device type.

-When you click a room you can:

- 1) Turn on or turn off your lights.
- 2) Change the color of home's lights
- 3) Change the rooms temperature with air conditioner
- 4) Turn on or turn off the sound system
- 5) Change the security system of the house
- 6) Lock or unlock the doors(exterior door, balcony doors and garage doors)
- 7) Start the roomba to clean your house or send it to charging
- 8) Turn on the water heating system of the house to heat the water in the water tank
- 9) Click device info to see that room's previous device states
- 10)Logout

-To open producer dashboard

- 1) Open the landing page
- 2) Click the producer login button
- 3) Enter the producer's e-mail and password

-When you already have access to customer dashboard you can:

- 1) See all the customer's information.
- 2) Can choose a customer to view their system
- 3) Logout

-When you choose a customer you can:

- 1) See all the rooms a customer has
- 2) Can click a room to see all the devices a customer has

-When you click a room you can:

- 1) See all the devices and their state a user has.
- 2) Can click on the device information to see the previous states of the devices