

SMART DOOR LOCK for Apartments

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GitHub link:

<https://github.com/chkrish9/2019-Fall-CC-Team7-SmartLockForApartments>

Demo link:

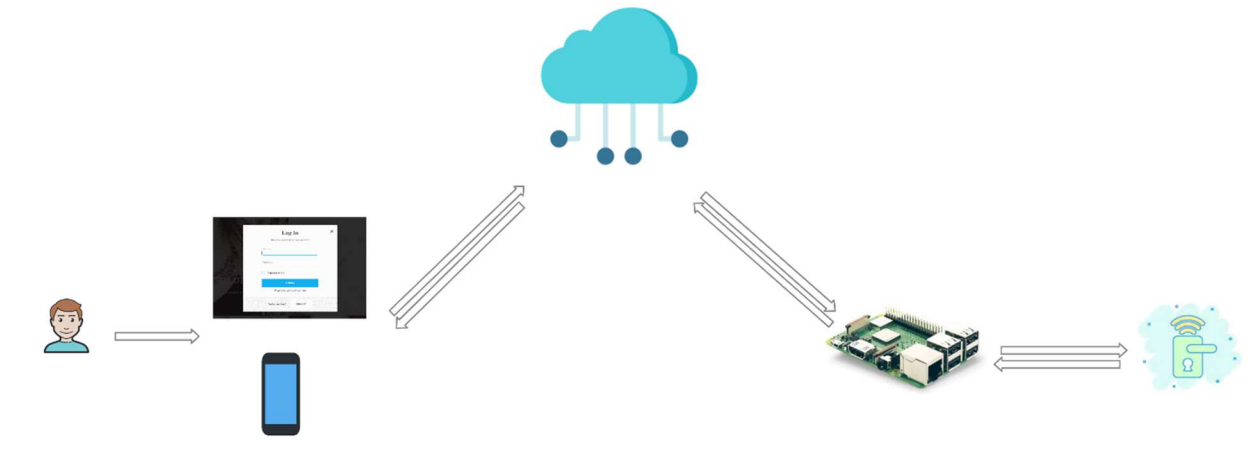
<https://youtu.be/VssRSiM6BqI>

Introduction:

Now a days, everyone is using ecommerce website for shopping. But online delivery has become major problem as the order is not delivered on time due to apartment main door lock. Not only that when our friends or family members want to visit our home, they are facing the same issue.

Smart door lock will give the solution for this problem by generate pass code for certain period of time.

Architecture:



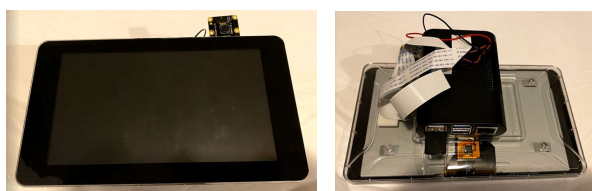
The above architecture shows all the connections are bi directional. User can login from web or mobile and connect to cloud to get the information. The raspberry pi connects to cloud to verify the access code and unlock the door. When the person enters the access code the raspberry pi takes the picture of the person and upload that to cloud.

Technologies used:

- MEAN Stack.
- Electron Js.
- Heroku.
- Html.
- jQuery.
- Bootstrap.

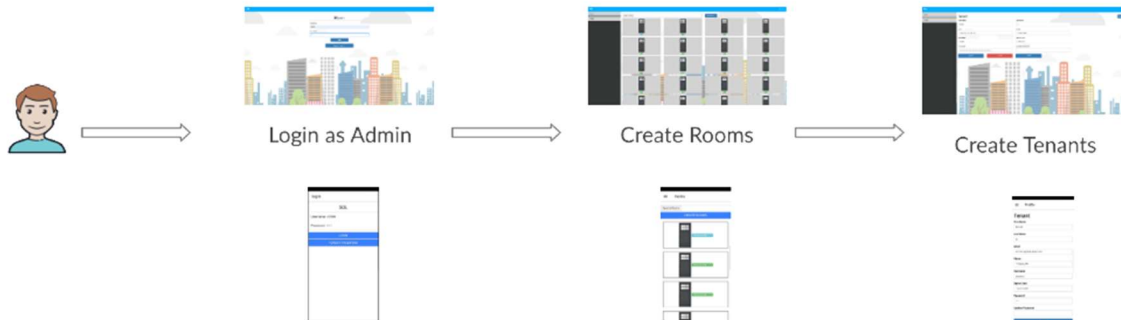
Hardware Used:

- Raspberry pi 4.
- Raspberry pi camera.
- Raspberry pi 7" inch touch screen display.



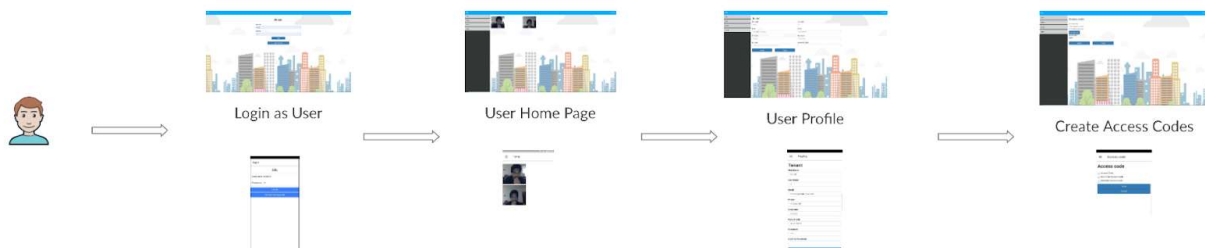
Application Flow:

Admin Flow:



By default, we are providing default “admin” user with password “admin”. The admin can able to create floors and rooms in the floor. Once the rooms are created the admin can able to add tenant information in each room. Once the tenant information is created, the tenant will get an email with username and password. Then the tenant user that information and update his information. He can install mobile or he can use web application to update the information.

Tenant Flow:



Tenant can login with his username and password. In the home page, he can able to see all the images who ever uses his generated access code. In the profile page he can update his password or email address etc., In the access code page he can create access codes. There are three types of access codes.

1. Normal Access code.
2. One-time Access code.
3. Schedule Access code.

Normal Access code:

Normal access code is used daily by the tenant to enter in to the apartment.

One-time Access code:

One-time access code is used by delivery person or some one who can use this code only once.

Schedule Access code:

Schedule access code is used by his family members or friends. This access code can be accessible only in particular period of time.

IOT Flow:



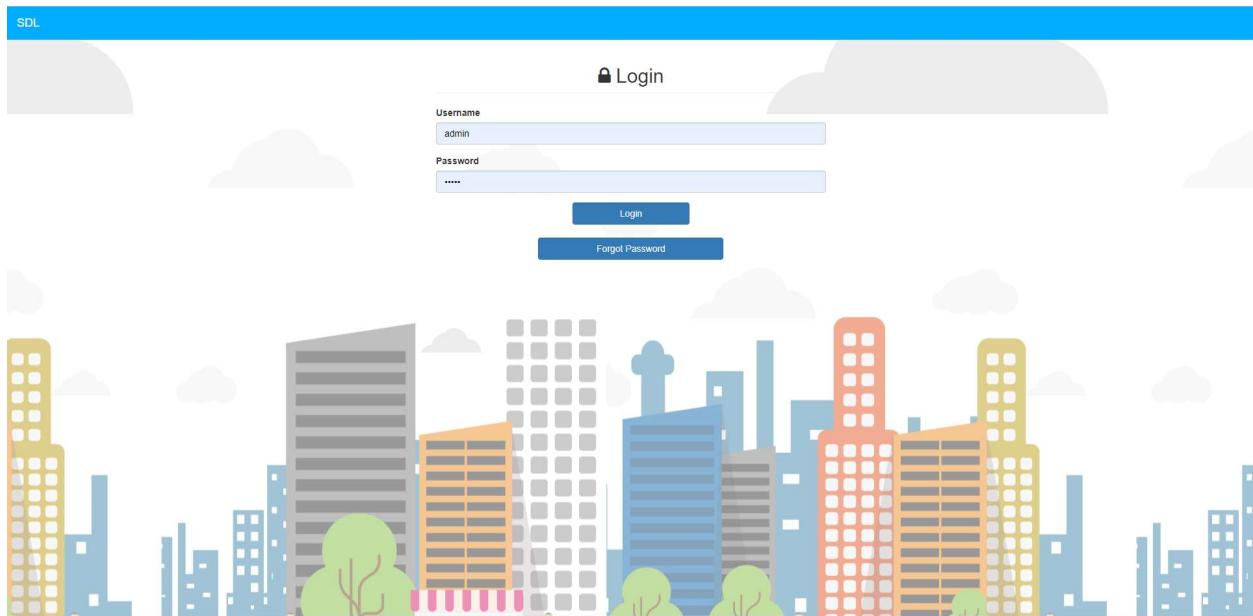
User enter the access code. Raspberry pi takes picture of the user and upload the image to the cloud and then verify the access code. If the access code is verified then the door unlock otherwise, the door remains lock.

Screenshots:

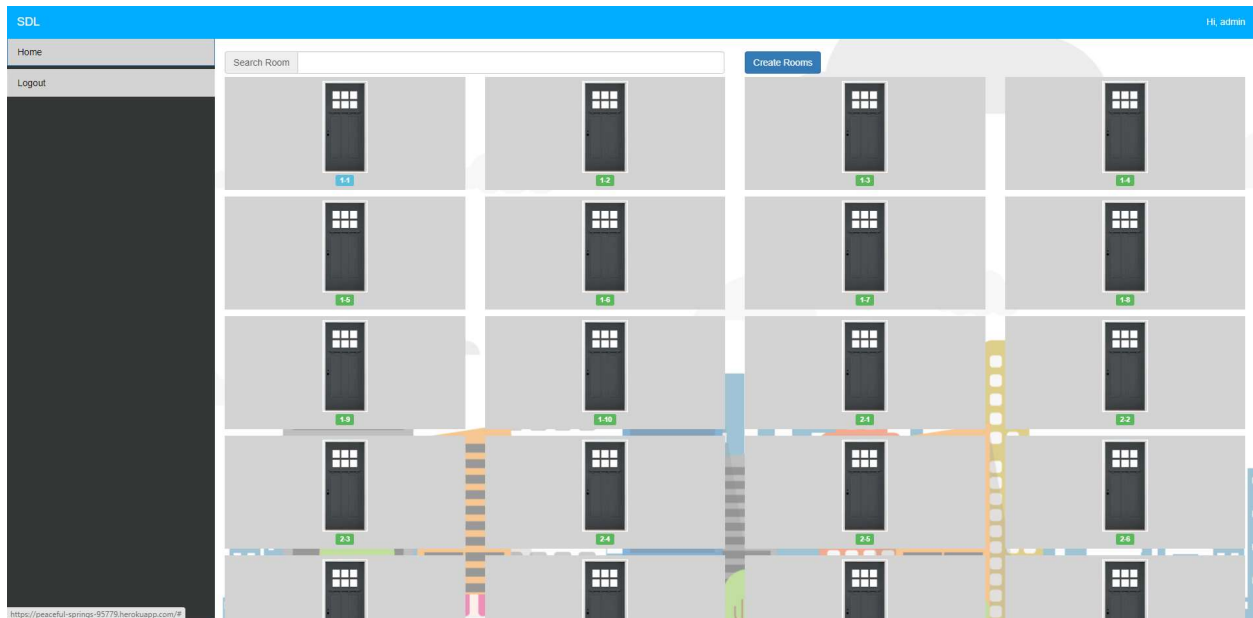
Web Application:

Admin:

1.Login page.



2. Home page.



3.Tenant information page.

The screenshot shows the 'Tenant' information page in the SDL system. The page has a blue header with 'SDL' on the left and 'HL admin' on the right. A sidebar on the left contains 'Home' and 'Logout' links. The main content area is titled 'Tenant' and contains a form with the following fields:

- First Name:** Murali
- Last Name:** C
- Email:** mcm5@mail.umkc.edu
- Phone:** 23244555645
- Username:** mcm5
- Date of Join:** 12-04-2019
- Password:** ****
- Confirm Password:** (empty)

At the bottom of the form are three buttons: 'Update' (blue), 'Vacate' (red), and 'Cancel' (blue). A 'Back to List' button is located in the top right corner. The background of the page features a stylized cityscape illustration with various colored buildings and green trees.

4.Creating more rooms.

The screenshot shows the room creation interface in the SDL system. A 'Create Rooms' modal dialog is open in the center of the screen. The dialog has a title bar with 'Create Rooms' and a close button (X). It contains two input fields:

- Enter Floor Number:** (empty)
- Enter Number of Rooms:** (empty)

At the bottom of the dialog are two buttons: 'Close' (grey) and 'Create' (blue). The background of the page shows a grid of room icons, each labeled with a number (e.g., 1.1, 1.2, 1.3, etc.). The interface has a blue header with 'SDL' on the left and 'HL admin' on the right. A sidebar on the left contains 'Home' and 'Logout' links. A 'Search Room' button is visible in the top left of the main content area.

Tenant:

1.Login.

SDL

🔒 Login

Username
mcmc5

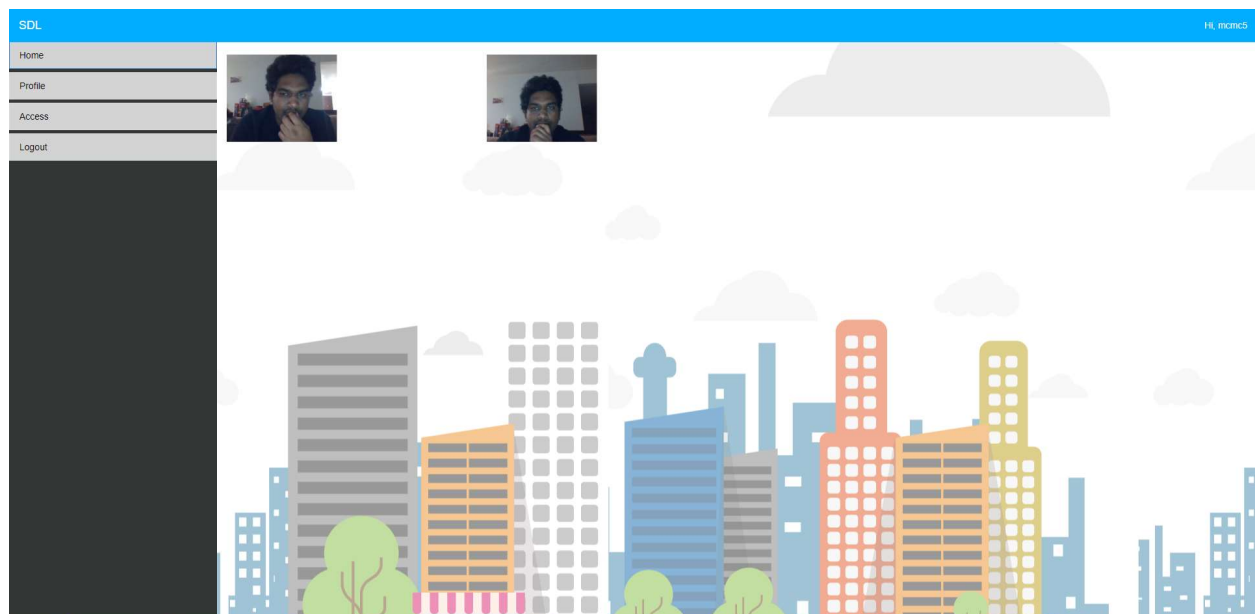
Password
....

Login

Forgot Password

<https://patoos.fun/spring/820729/40000/suapp.com/4/>

2.Home page.



3. Profile page.

SDL Hi, mcmc5

Home Profile Access Logout

Tenant

First Name: Murali

Last Name: C

Email: mcmc5@mail.umkc.edu

Phone: 23244555645

Username: mcmc5

Date of Join: 12-04-2019

Password:

Confirm Password:

Update Cancel

4. Access code.

a. Normal access code.

SDL Hi, mcmc5

Home Profile Access Logout

Access code

☒ Access Code

☐ One Time Access Code

☐ Schedule Access Code

Generate Code

Access code 944574

Update Cancel

b. One-time access code.

SDL Hi, memob

Home

Profile

Access

Logout

Access code

- ☐ Access Code
- ☒ One Time Access Code
- ☐ Schedule Access Code

[Generate One Time Access Code](#)

Access code
944453

[Save](#) [Cancel](#)

Success
Code saved successfully.

c. Schedule access code.

SDL Hi, memob

Home

Profile

Access

Logout

Access code

- ☐ Access Code
- ☐ One Time Access Code
- ☒ Schedule Access Code

Date of Entry
12-02-2019

Start Time
01 : 00

End Time
23 : 00

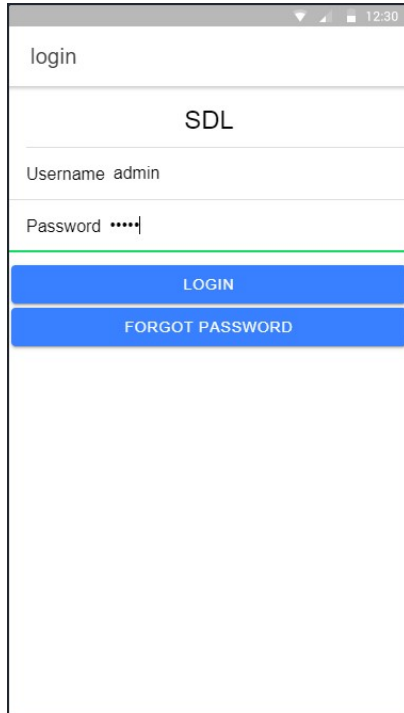
Access code
684298

[Update](#) [Cancel](#)

Mobile pages:

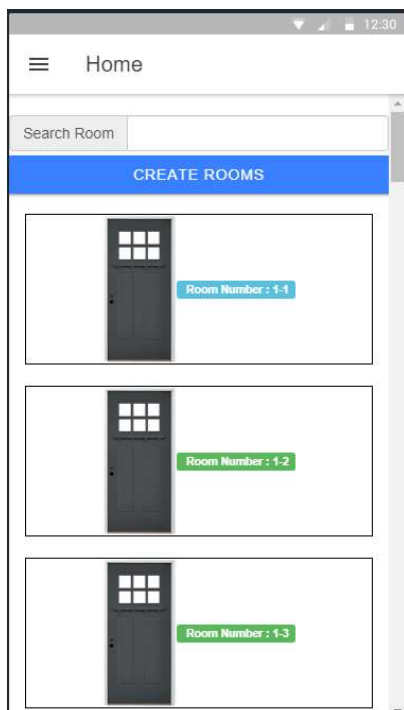
Admin:

1.Login.



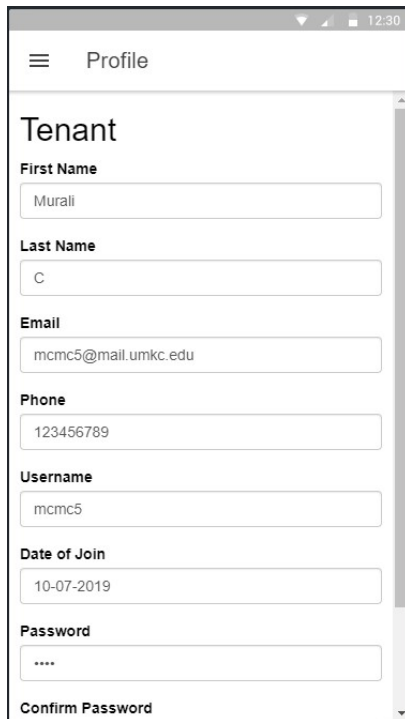
A screenshot of a mobile application's login screen. At the top, there's a status bar with signal, Wi-Fi, and battery icons, and the time 12:30. Below the status bar is a header with the word "login". Underneath is a section titled "SDL". There are two input fields: "Username admin" and "Password ****". Below the password field are two blue buttons: "LOGIN" and "FORGOT PASSWORD".

2.Home.



A screenshot of a mobile application's home screen. At the top, there's a status bar with signal, Wi-Fi, and battery icons, and the time 12:30. Below the status bar is a header with a hamburger menu icon and the word "Home". Underneath is a search bar labeled "Search Room". Below the search bar is a blue button labeled "CREATE ROOMS". There are three room cards, each featuring a door icon and a label: "Room Number : 1-1", "Room Number : 1-2", and "Room Number : 1-3".

3.Profile.



A mobile application interface for a user profile. The screen has a grey status bar at the top with a signal strength icon, a battery icon, and the time 12:30. Below the status bar is a white header with a hamburger menu icon on the left and the word "Profile" in the center. The main content area is white and contains a scrollable list of form fields. The title "Tenant" is displayed in a large, bold font. The form fields are labeled "First Name", "Last Name", "Email", "Phone", "Username", "Date of Join", "Password", and "Confirm Password". Each label is followed by a text input field. The input fields contain the following values: "Murali", "C", "mcmc5@mail.umkc.edu", "123456789", "mcmc5", "10-07-2019", "****", and an empty field. A vertical scrollbar is visible on the right side of the form fields.

Profile

Tenant

First Name
Murali

Last Name
C

Email
mcmc5@mail.umkc.edu

Phone
123456789

Username
mcmc5

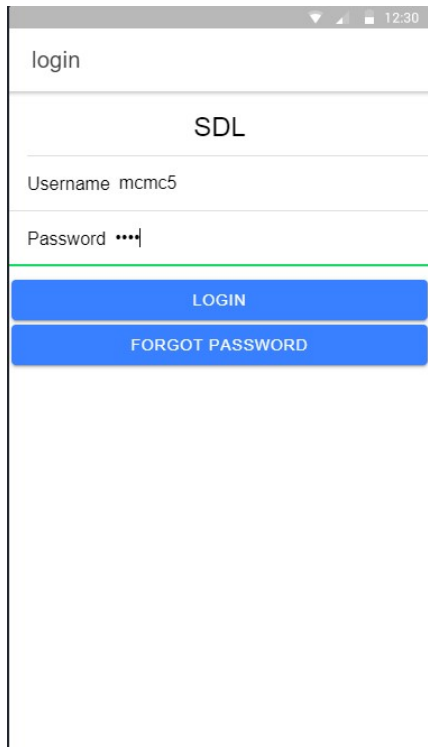
Date of Join
10-07-2019

Password

Confirm Password

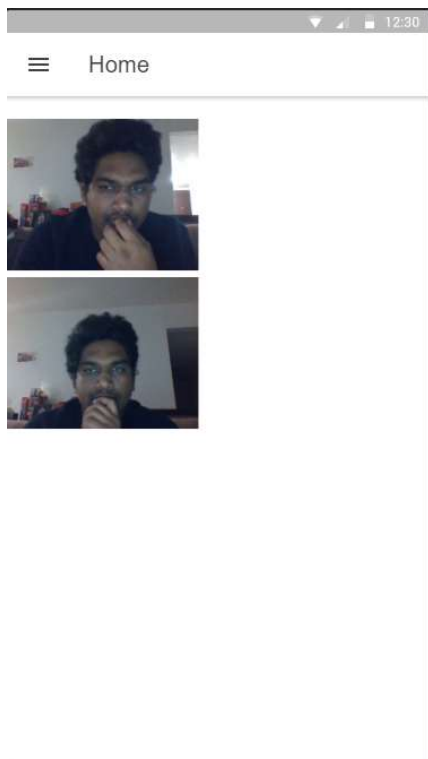
Tenant:

1.Login.

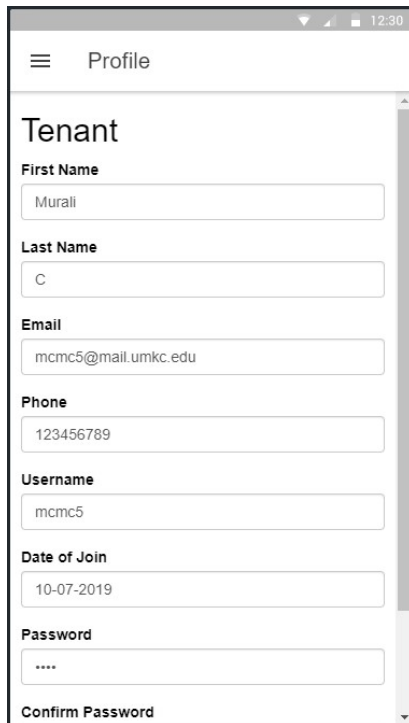


A screenshot of a mobile application's login screen. At the top, a status bar shows signal strength, Wi-Fi, and the time 12:30. Below the status bar, the word "login" is displayed. A horizontal line separates the title from the content. The text "SDL" is centered. Below "SDL", there are two input fields: "Username mcmc5" and "Password ****". A green horizontal line is positioned below the password field. At the bottom, there are two blue buttons: "LOGIN" and "FORGOT PASSWORD".

2.Home.



3.Profile.



A mobile application screenshot of the 'Profile' page. The page has a grey header bar with a hamburger menu icon and the title 'Profile'. Below the header, the word 'Tenant' is displayed in a large, bold font. The profile information is organized into a list of fields, each with a label and a text input box. The fields are: 'First Name' (Murali), 'Last Name' (C), 'Email' (mcmc5@mail.umkc.edu), 'Phone' (123456789), 'Username' (mcmc5), 'Date of Join' (10-07-2019), 'Password' (masked with four dots), and 'Confirm Password' (label visible, input box not fully shown). A vertical scrollbar is visible on the right side of the form.

Profile

Tenant

First Name
Murali

Last Name
C

Email
mcmc5@mail.umkc.edu

Phone
123456789

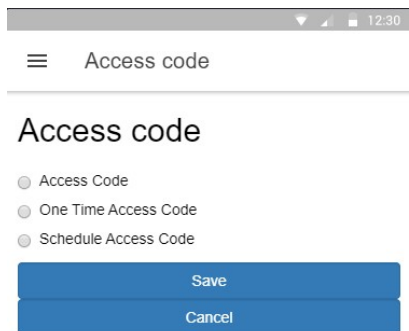
Username
mcmc5

Date of Join
10-07-2019

Password
....

Confirm Password

4.Access code.



A mobile application screenshot of the 'Access code' page. The page has a grey header bar with a hamburger menu icon and the title 'Access code'. Below the header, the title 'Access code' is displayed in a large, bold font. There are three radio button options: 'Access Code', 'One Time Access Code', and 'Schedule Access Code'. The 'Access Code' option is selected. At the bottom of the page, there are two blue buttons: 'Save' and 'Cancel'.

Access code

☒ Access Code
☐ One Time Access Code
☐ Schedule Access Code

Save


Cancel

IOT:

1.Home.

Welcome to SDL Apartments

Please look camera while entering the pin.



1

2

3

4

5

6

7

8

9

⬅️✖


0

➡️✔

2.Enter the code.

Welcome to SDL Apartments

Please look camera while entering the pin.



1

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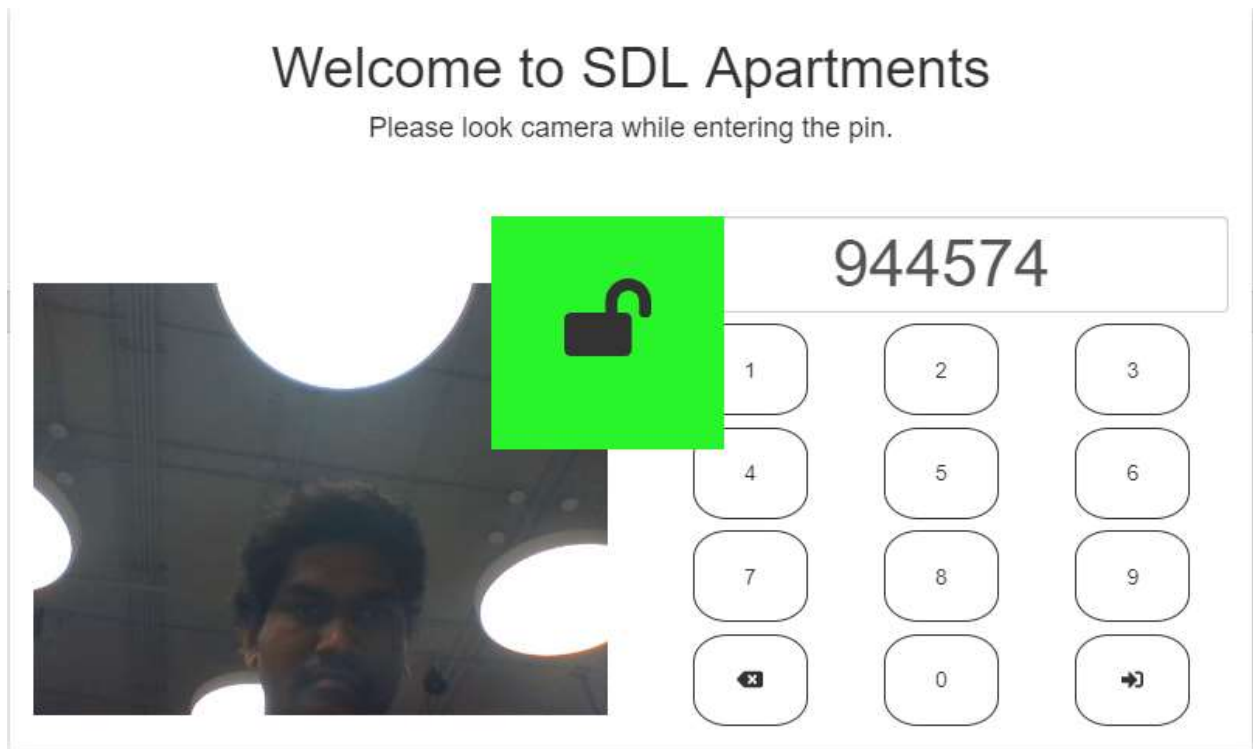
9

⬅️✖

0

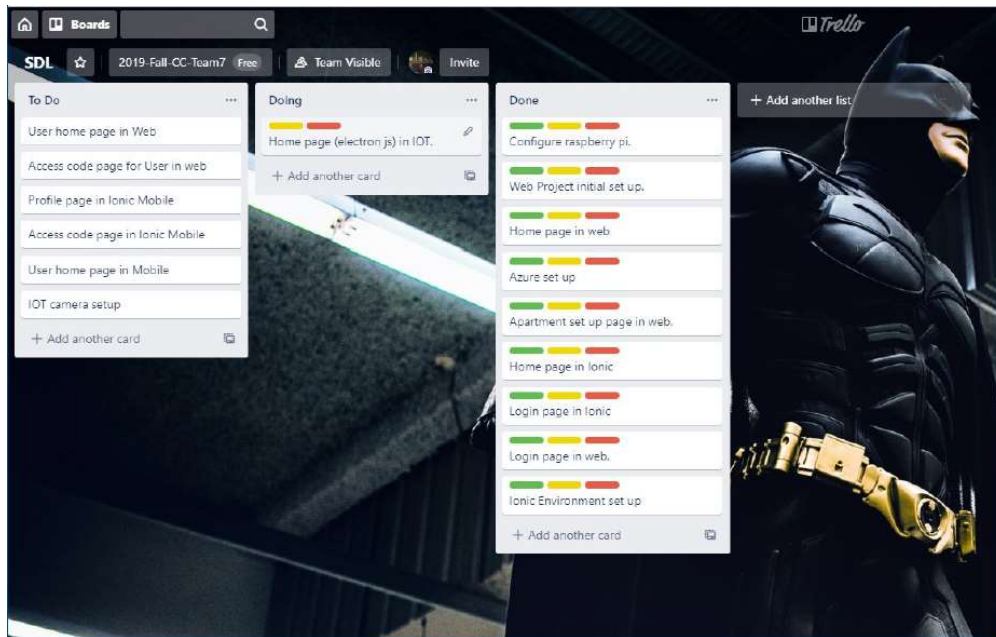
➡️✔

3.Unlock.

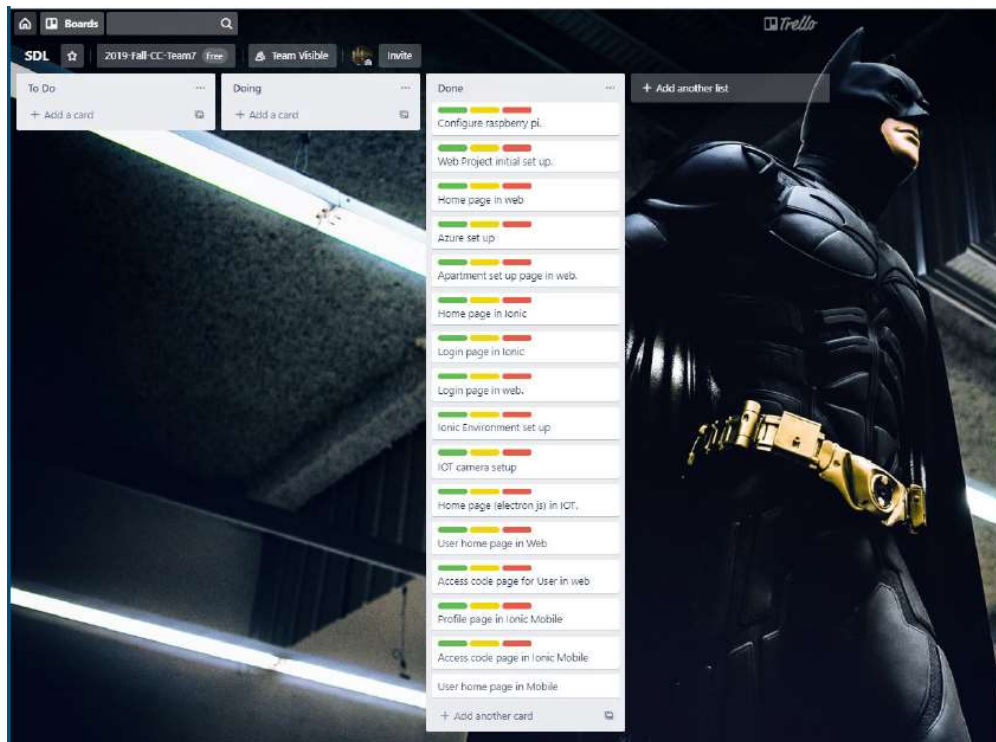


Trello:

Increment 1:



Final Increment:



Challenges faced:

Cloud set up.

- For the first increment, we used Azure cloud platform but, when we tried to deployed the second increment azure stopped working. The application is not showing any error in the telnet. When we try to open the application in browser it is showing an error message site can't reach. I checked all the ports not changed. We wasted around 2 days to resolve the issue but we didn't find any solution because, we have only terminal access to the machine. So, at last we decided to deploy in Heroku.

IOT hardware setup.

- Setup the IOT hardware is a big thing. If the cables are not connected properly it will burn the circuits. We face same problem while connecting the camera. The cable connection is not proper results the reboot raspberry pi repeatedly. We bought a new cable then it works fine.

Electron js version problem.

- We used electron js in the raspberry pi to create standalone application using JavaScript. This is the first time we are using electron js for standalone application. While implementing on the windows machine the application works fine. But when we moved to raspberry pi the application is not working properly. This is because of the platform. The new electron js version has few issues while running on raspberry pi OS. We fixed this issue by downgrading the version of electron js.

Integration issues between devices.

- We have 3 different kinds of applications.
 - o Web Application (MEAN stack).
 - o Mobile Application (Ionic).
 - o IOT Application (Electron js).
- When we try to communicate from one kind to other, we faced few issues.

References:

<https://electronjs.org/docs>

<https://www.youtube.com/watch?v=1tRLveSyNz8>

<https://projects.raspberrypi.org/en/projects/getting-started-with-picamera>

<https://thepihut.com/blogs/raspberry-pi-tutorials/45295044-raspberry-pi-7-touch-screen-assembly-guide>

<https://www.youtube.com/watch?v=r2ga-iXS5i4>