SMART DOOR LOCK for Apartments

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GitHub link:

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

Demo link:

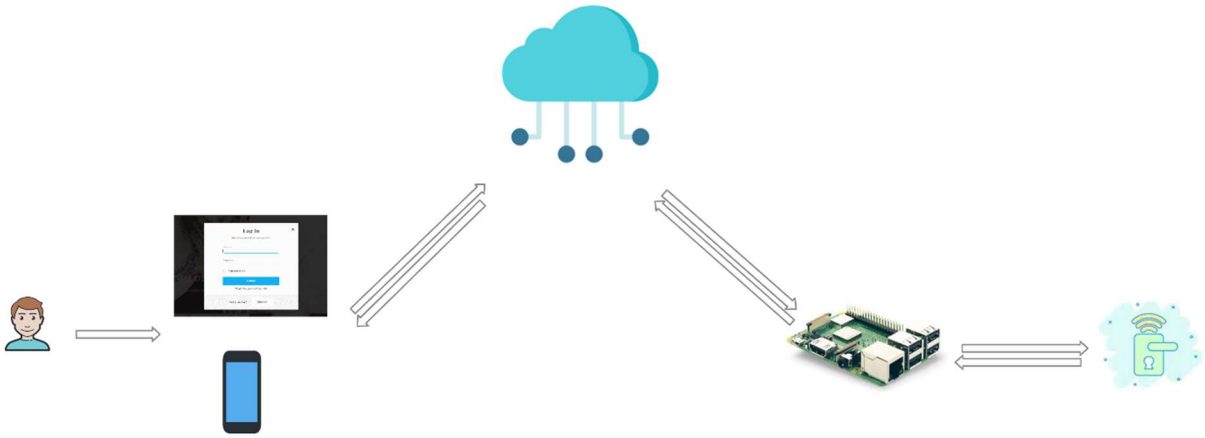
https://youtu.be/VssRSiM6BqI

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:



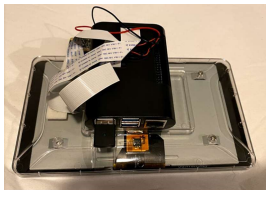
The above architecture shows all the connections are bi directional. User can login from web or mobile and connect to cloud to get the information. The raspberry pi connects to cloud to very the access code and unlock the door. When the person enters the access code the raspberry pi takes the picture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

Technologies used:

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

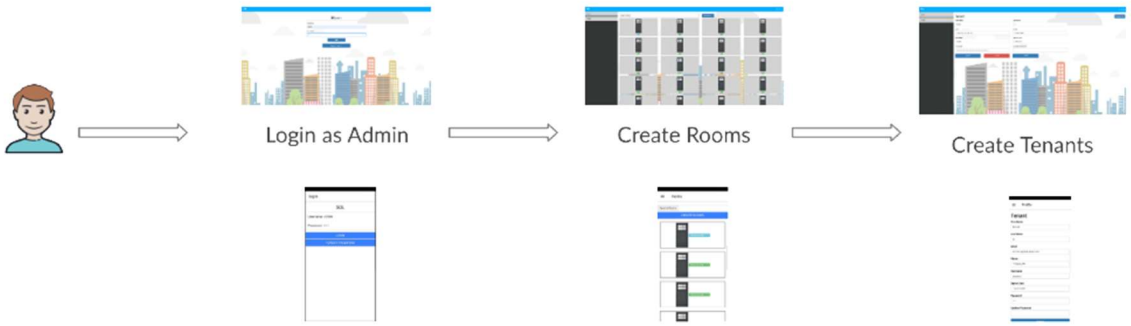
Hardware Used:

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



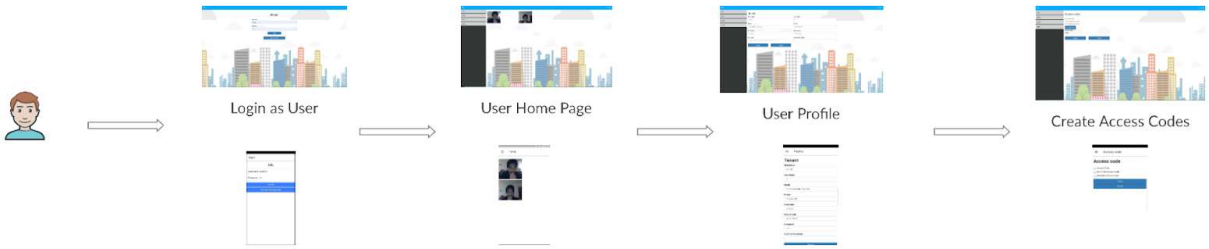
Application Flow:

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:

Home page | Enter the Access code | If Access code is correct it will unlock

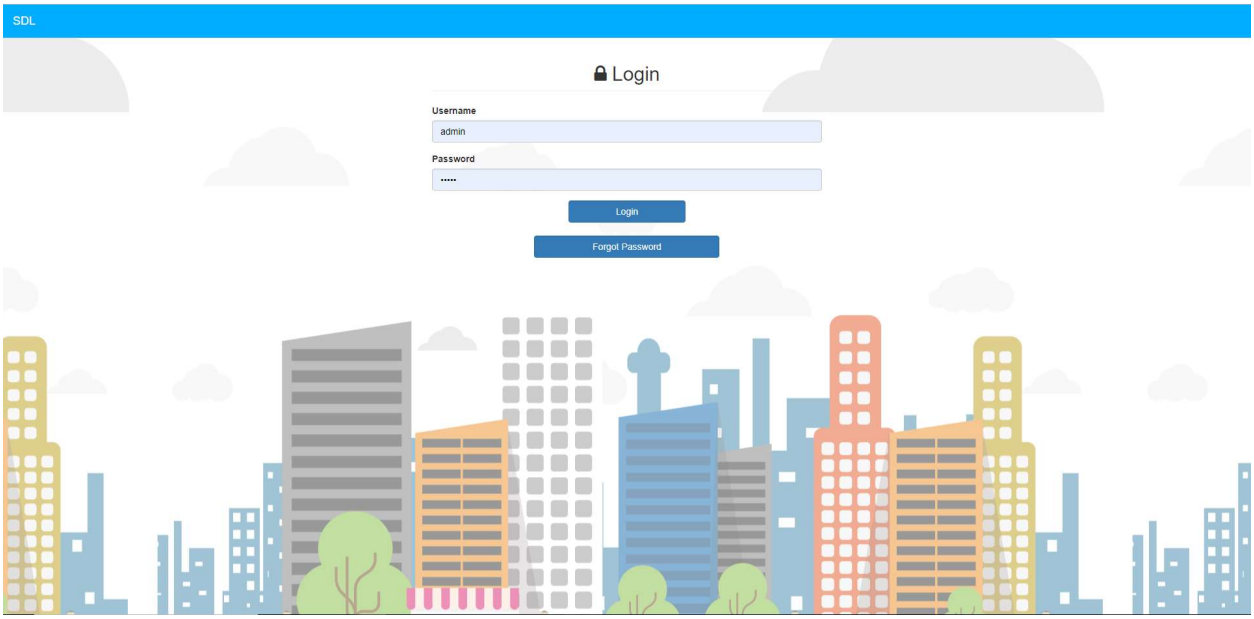
User enter the access code. Raspberry pi takes picture of the user and upload the image to the cloud and then verify the access code. If the access code is verified then the door unlock otherwise, the door remains lock.

Screenshots:

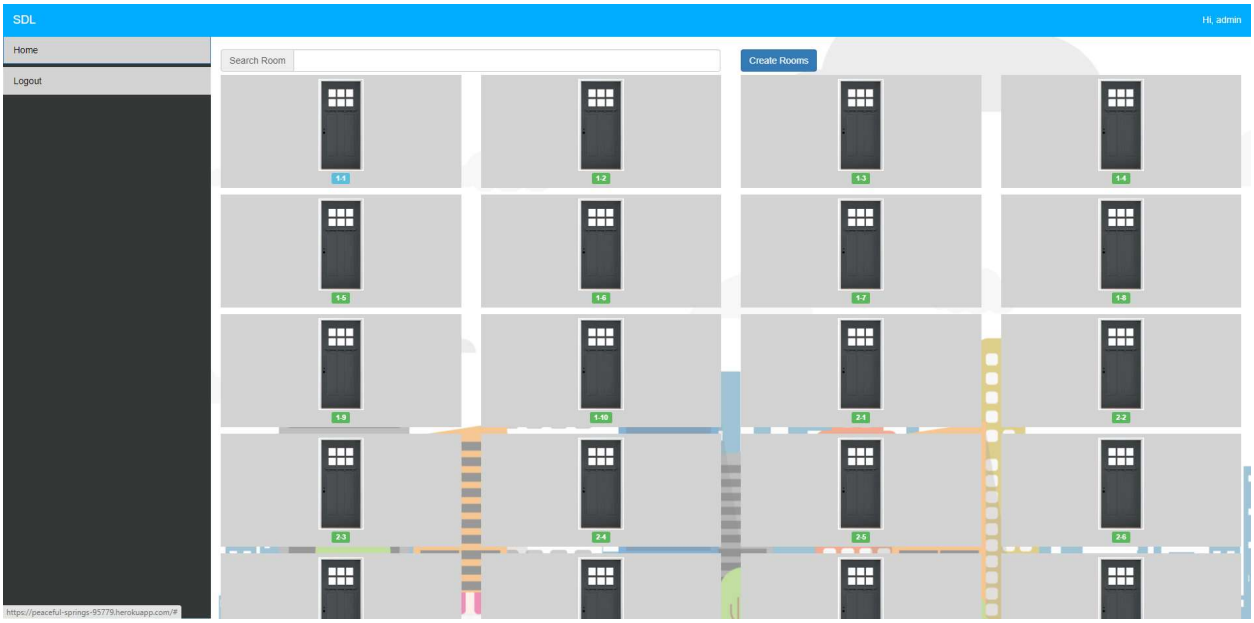
Web Application:

Admin:

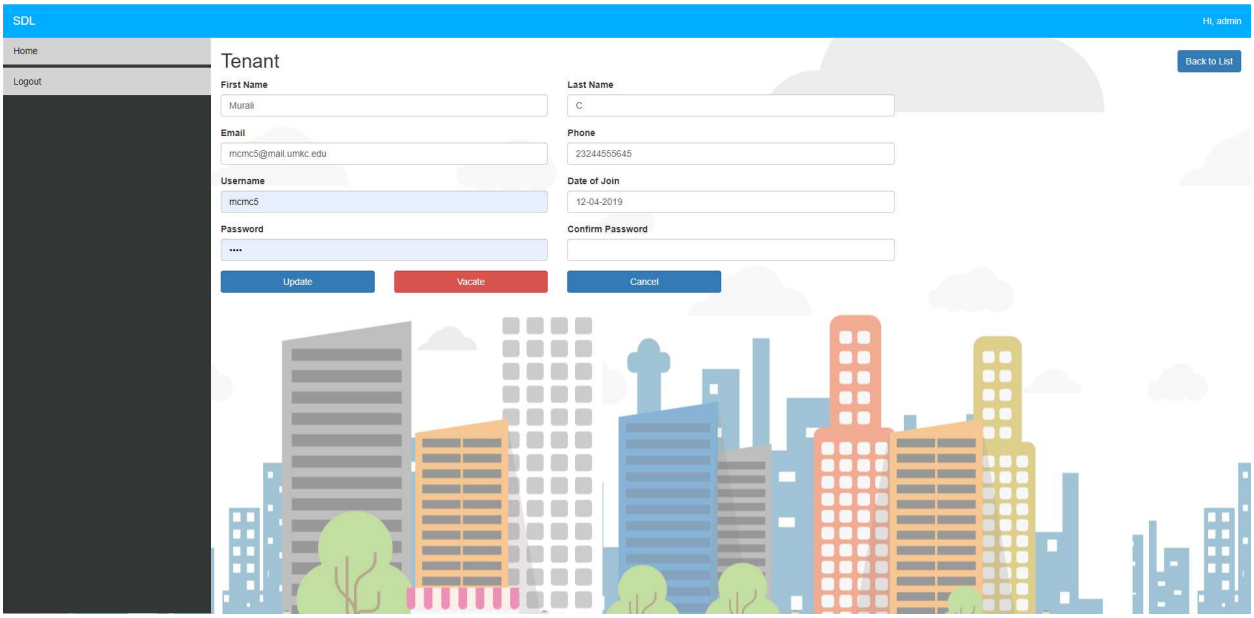
1.Login page.



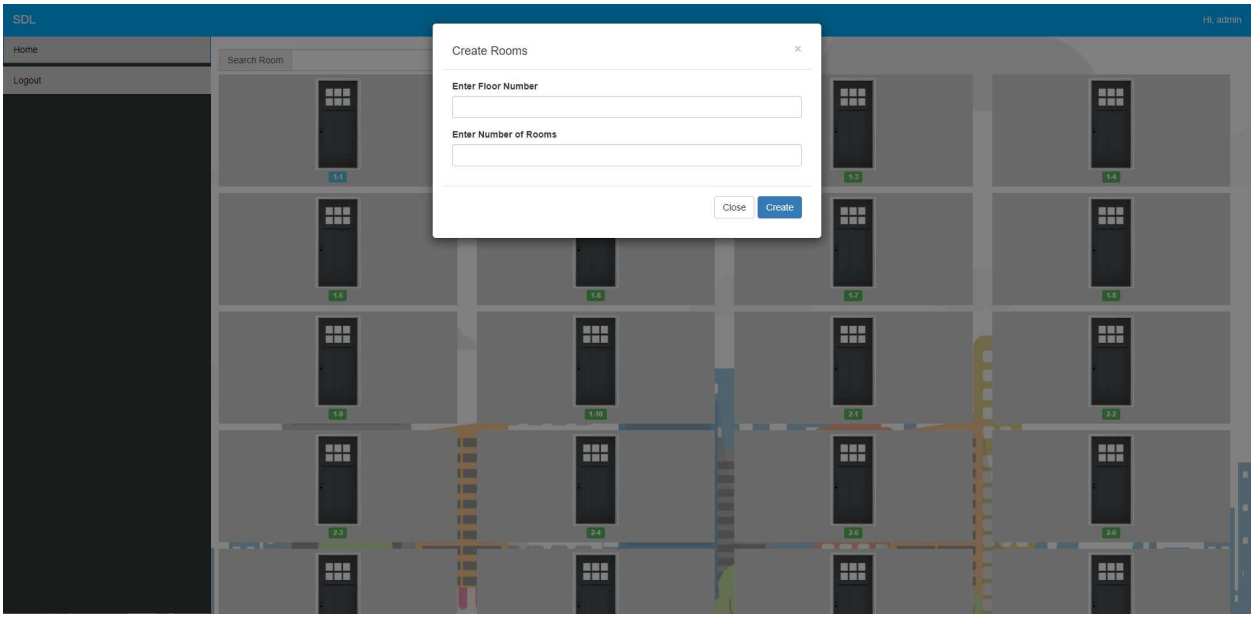
2. Home page.



3.Tenant information page.

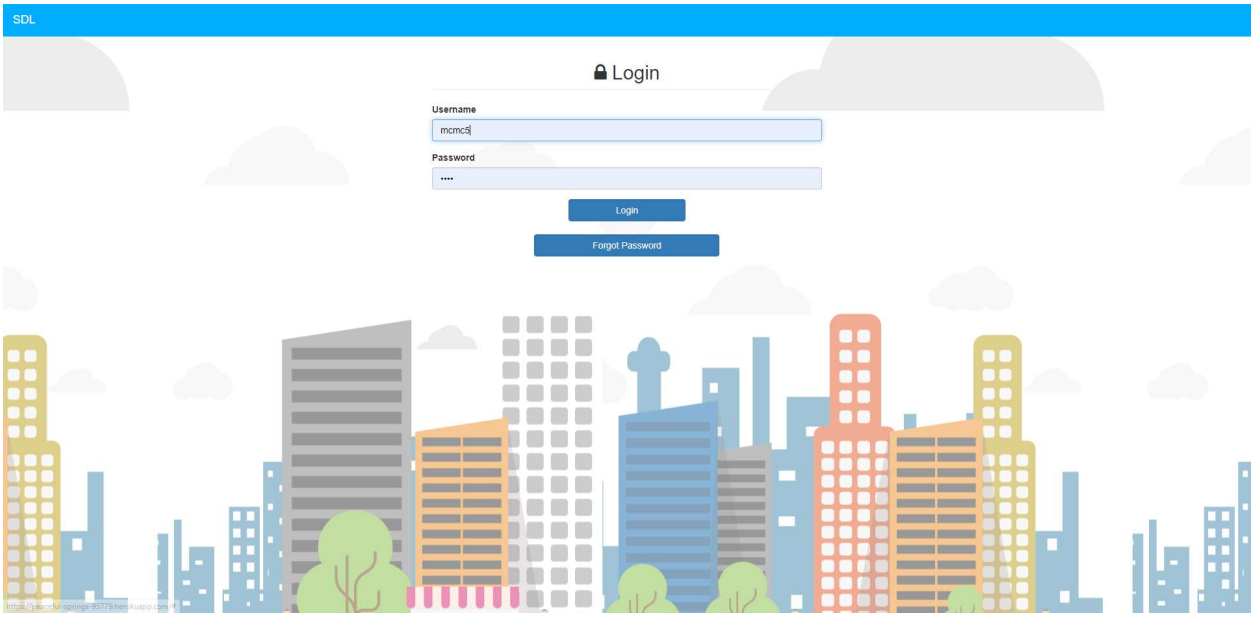


4.Creating more rooms.

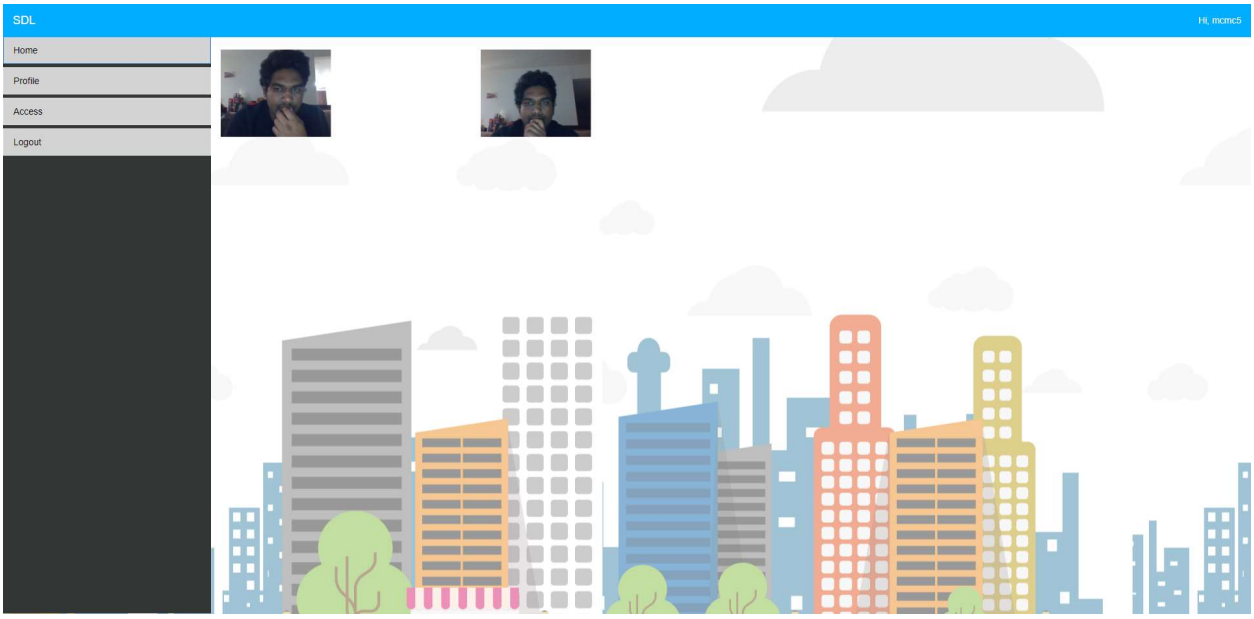


Tenant:

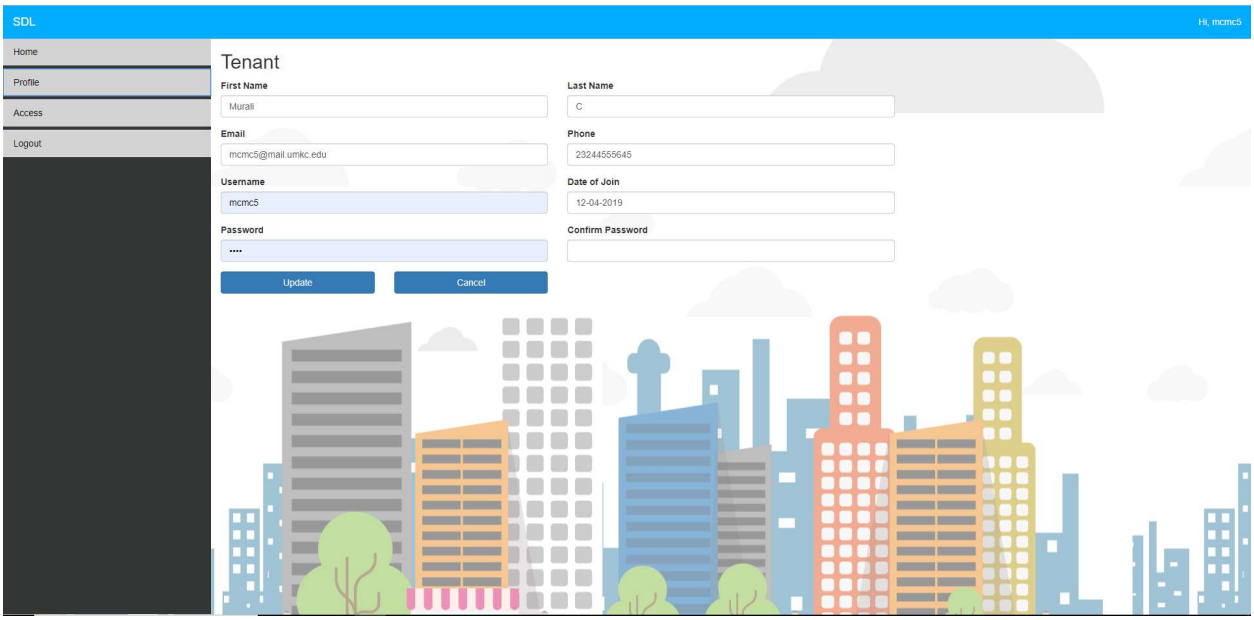
1.Login.



2.Home page.

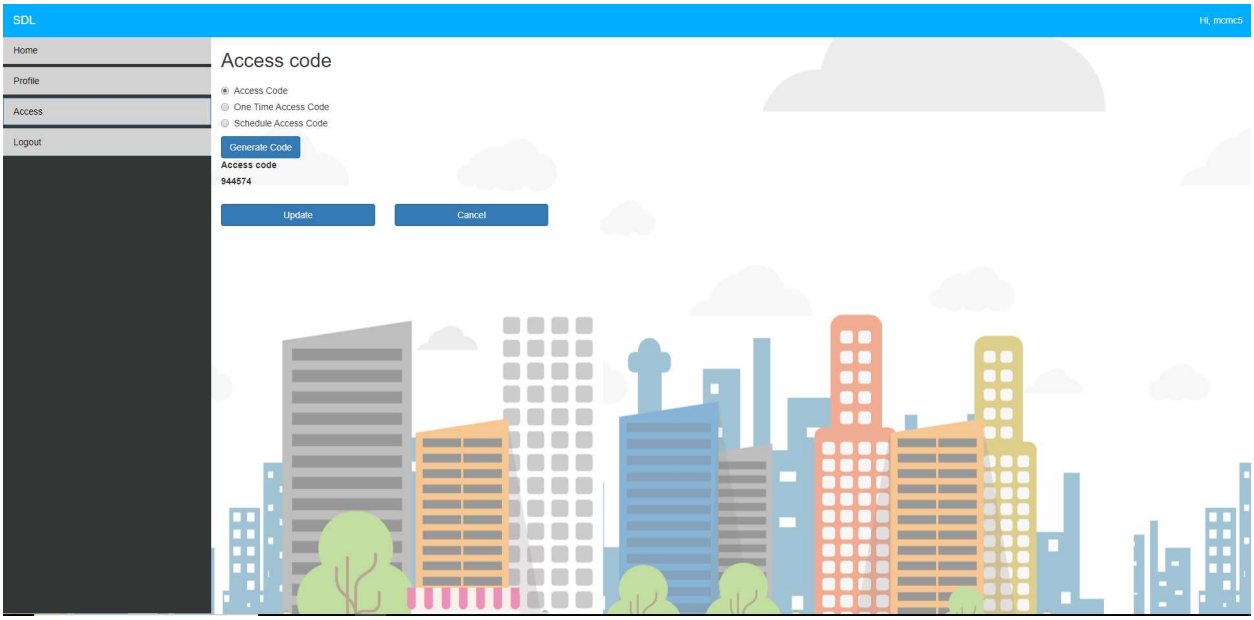


3. Profile page.

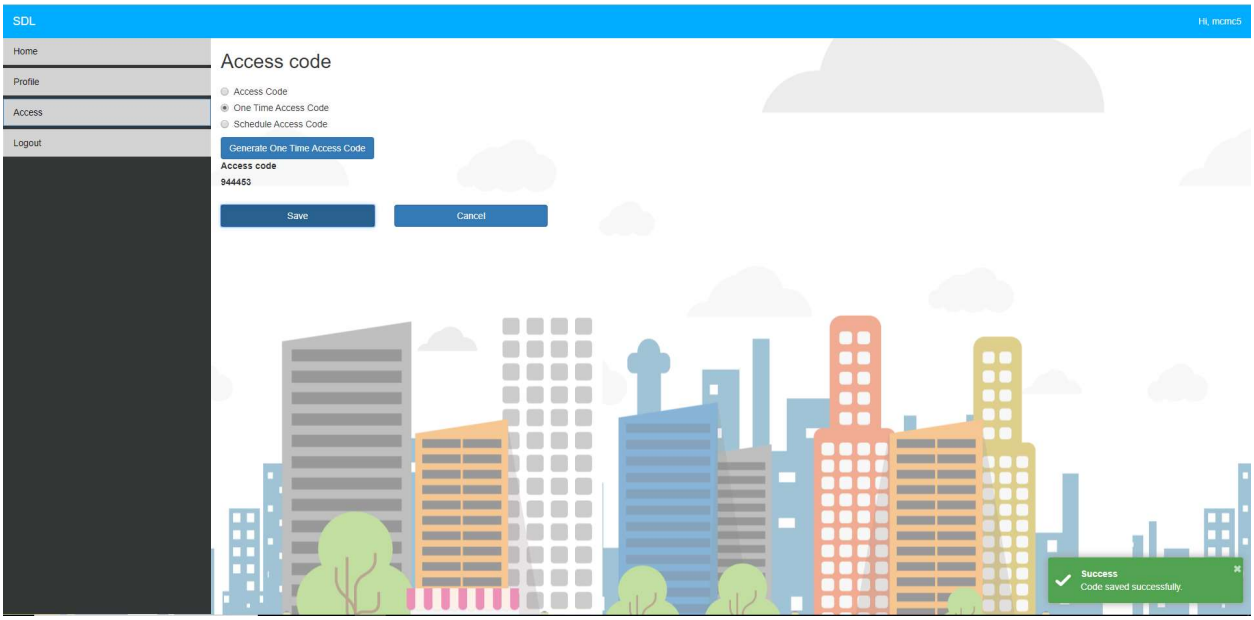


4. Access code.

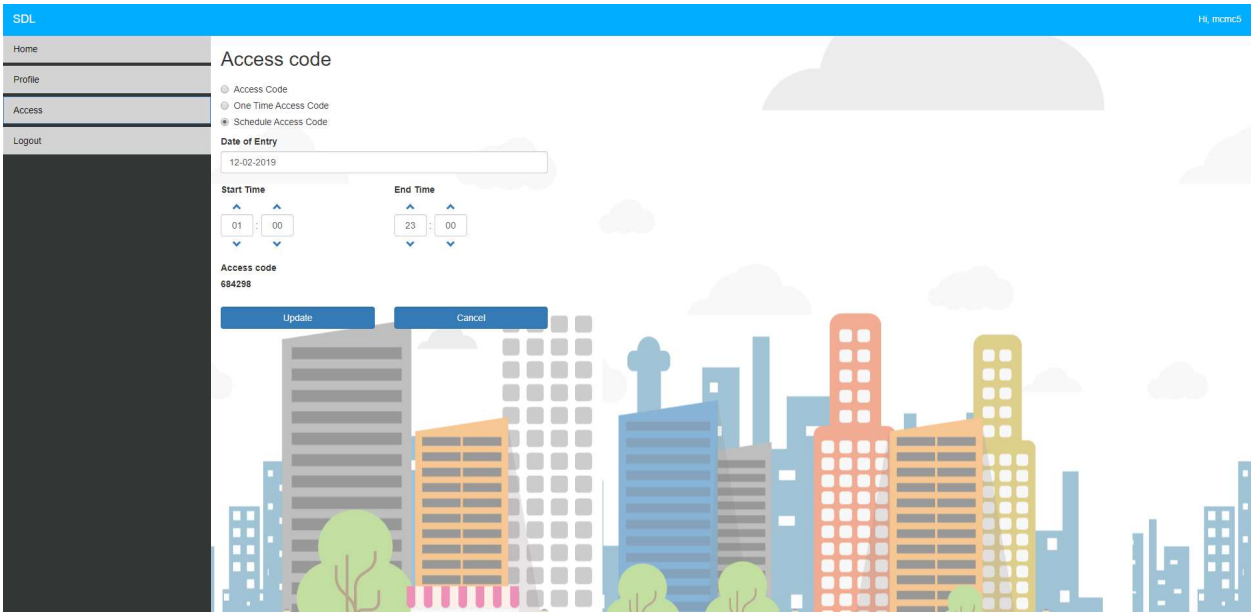
a. Normal access code.



b. One-time access code.



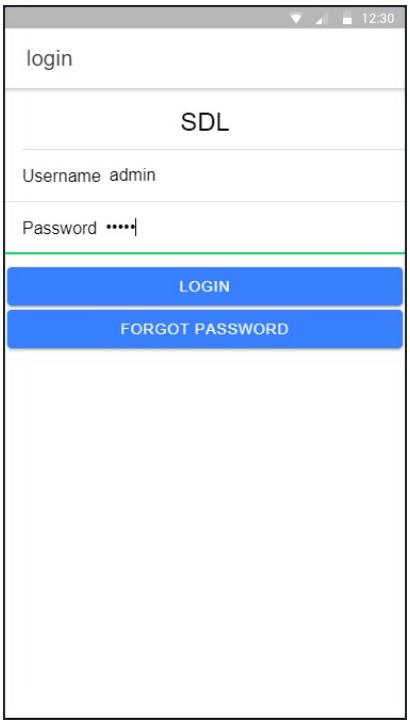
c. Schedule access code.



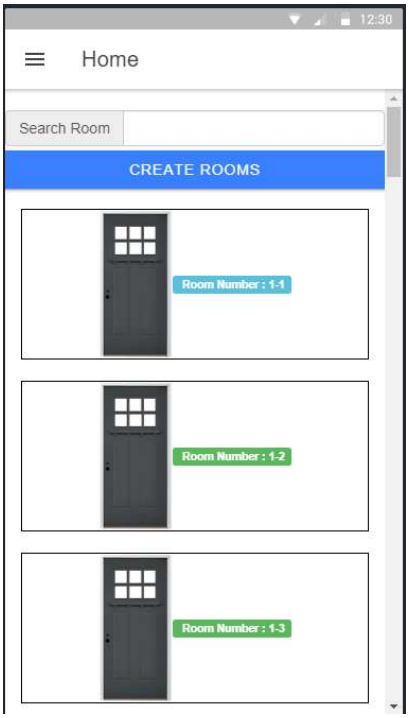
Mobile pages:

Admin:

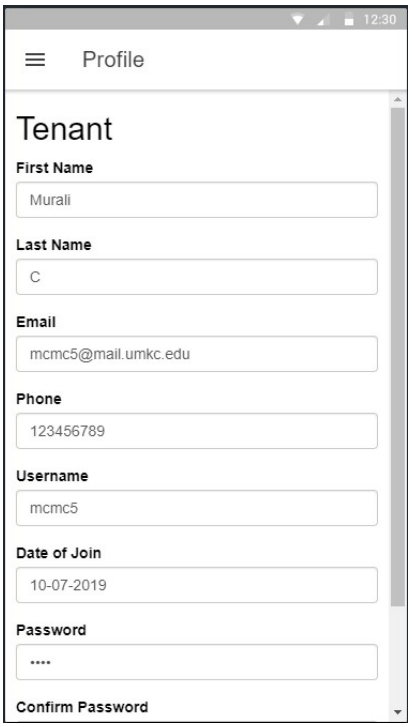
1.Login.



2.Home.

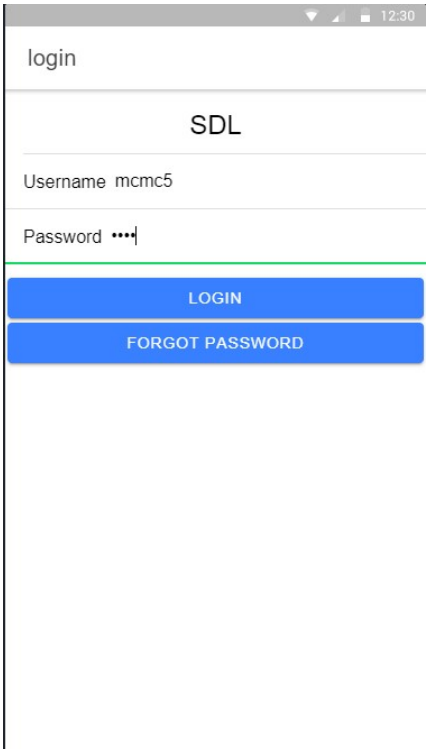


3.Profile.

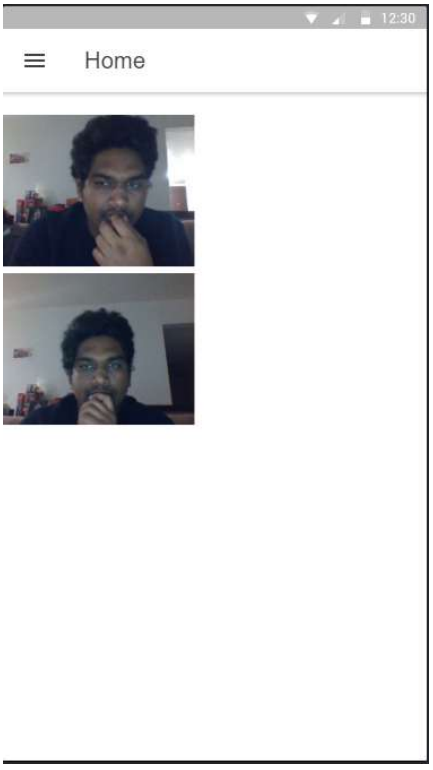

12:30
Profile
Tenant
First Name
Murali
Last Name
C
Email
mcmc5@mail.umkc.edu
Phone
123456789
Username
mcmc5
Date of Join
10-07-2019
Password
••••
Confirm Password

Tenant:

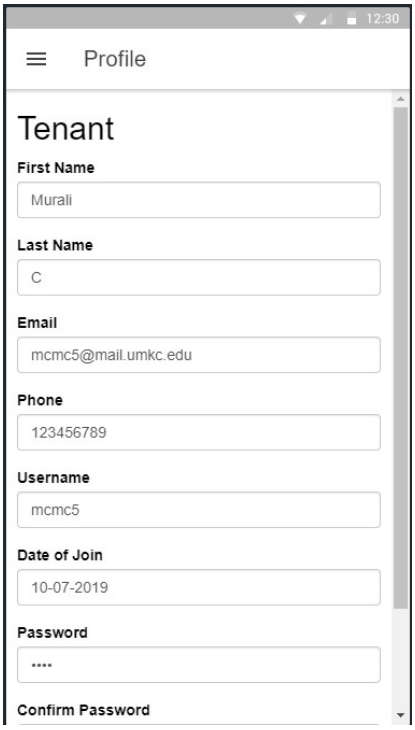
1.Login.



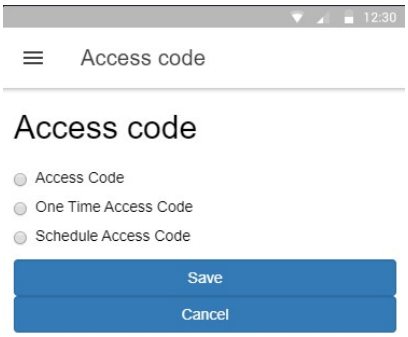
2.Home.



3.Profile.

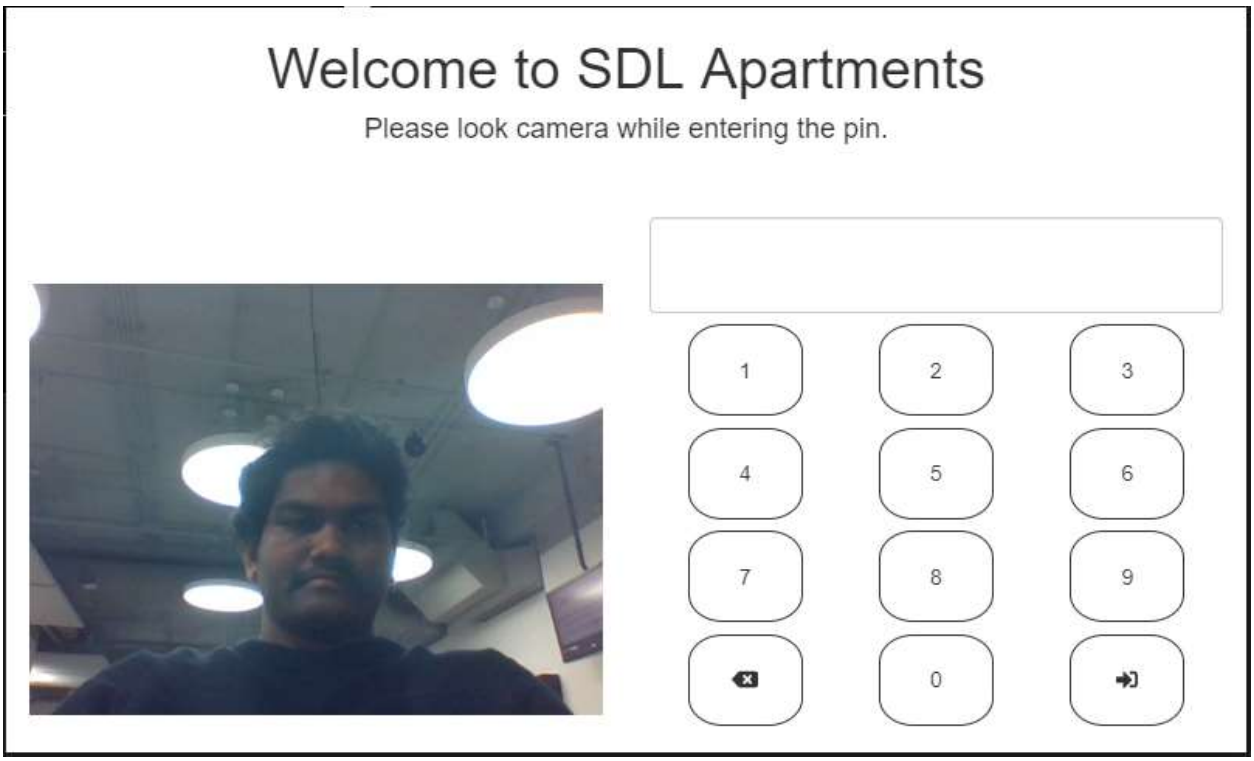


4.Access code.

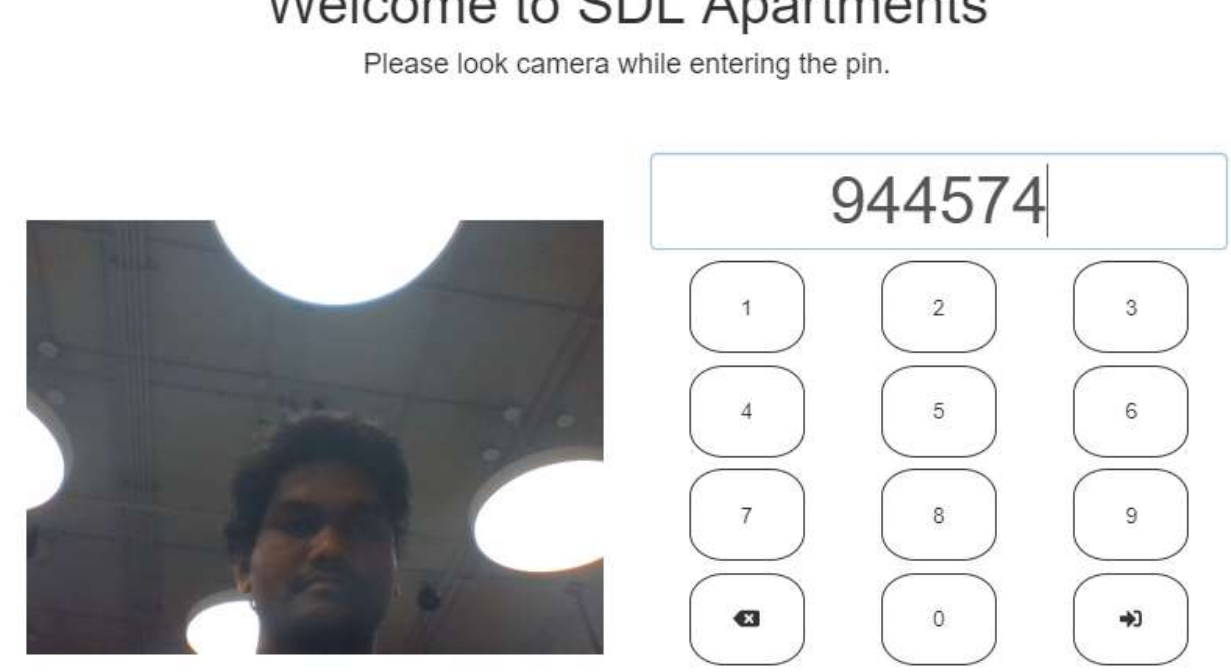


IOT:

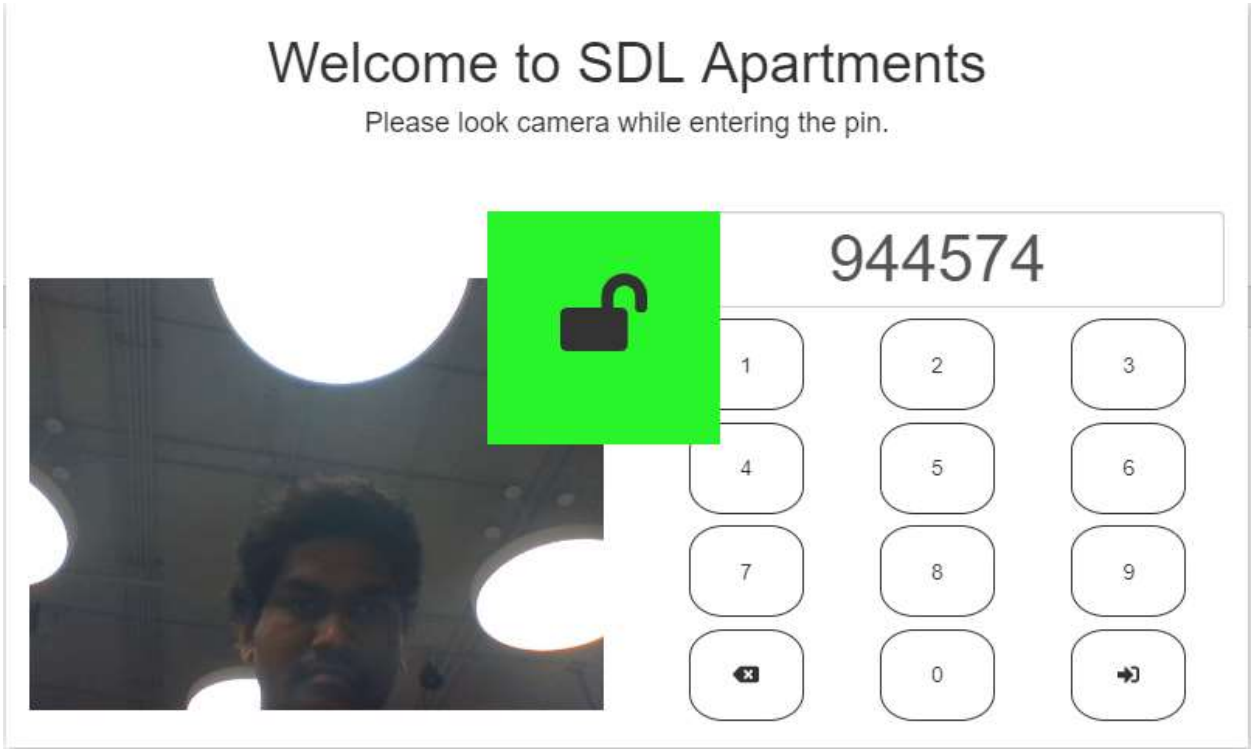
1.Home.



2.Enter the code.



3.Unlock.


Welcome to SDL Apartments
Please look camera while entering the pin.
944574
1
2
3
4
5
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8
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0

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.
    - Web Application (MEAN stack).
    - Mobile Application (Ionic).
    - 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