

Online Home Automation Control System

Graduation Project 2 Presentation
Group 45 - JC8
Dr Abeer Mahmoud

Introduction

- **Very fast increase in automation** in the recent decade
- **Higher demand** for applications that can support remote control
- especially electrically controlled house appliances



Problem Statement

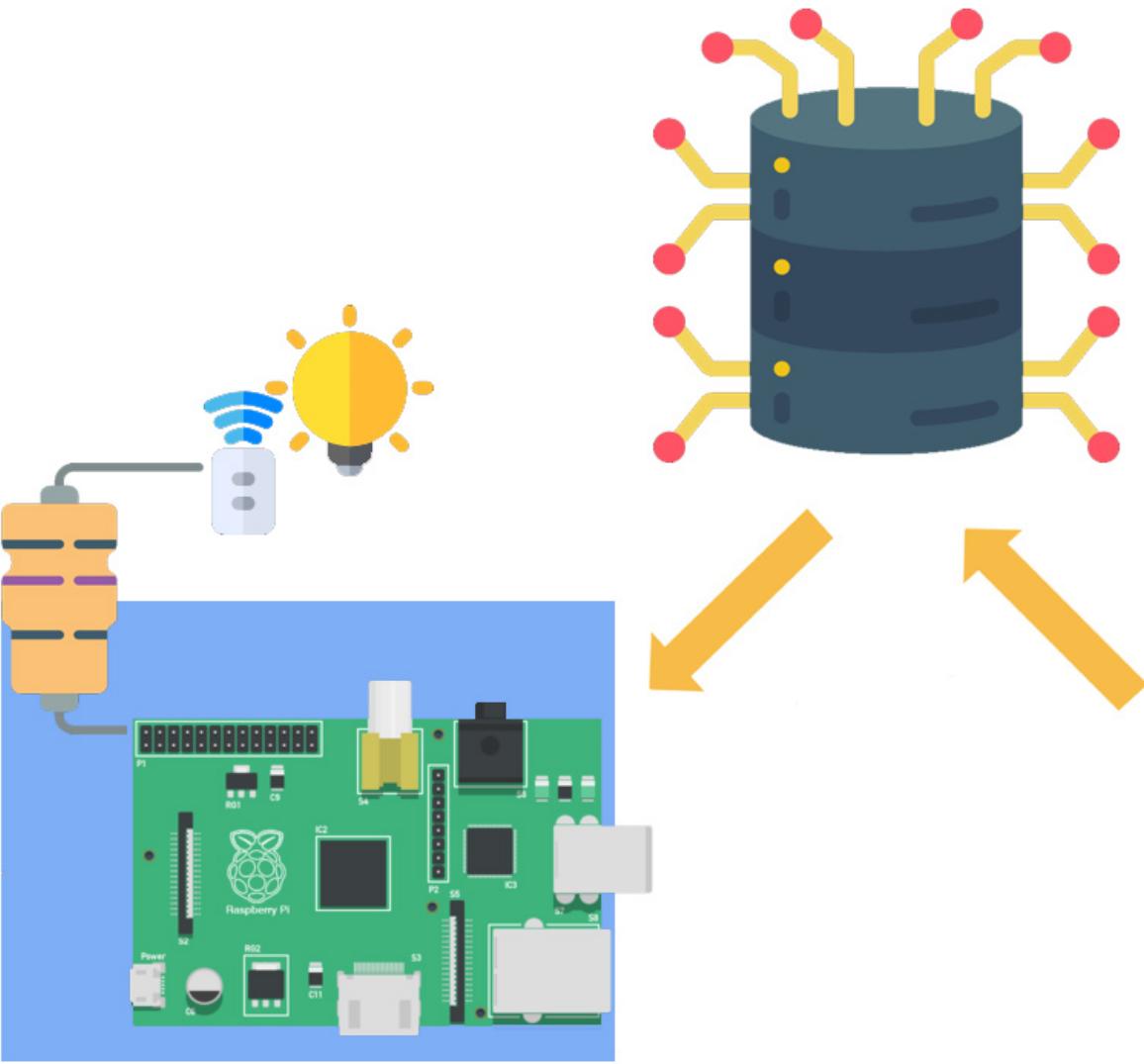
- **Many applications available** providing remote control at home
- **All work in a small set of devices and sensors**
- Main challenge: control these devices through the Internet
- Important for pet owners with UV lights, parents waking their children up etc



Objective and Proposed Solution

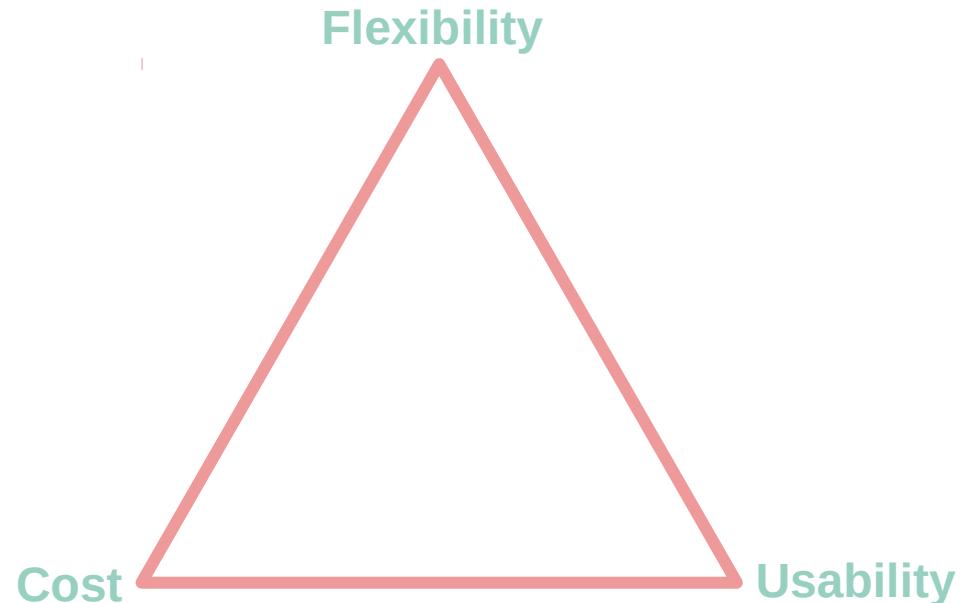
- **Objective:**
 - remote control of house appliances through IoT
- **Solution:**
 - creating **Android mobile** application that controls switches/lights etc by issuing commands
 - using **Raspberry Pi** to switch the lights/switches on and off
 - creating a **web application** interface between the mobile application and laptop



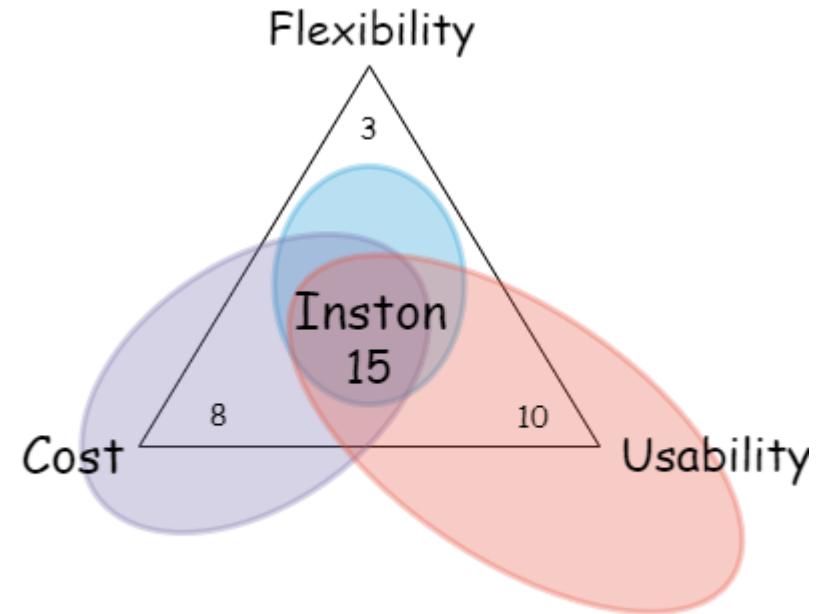


Related Work

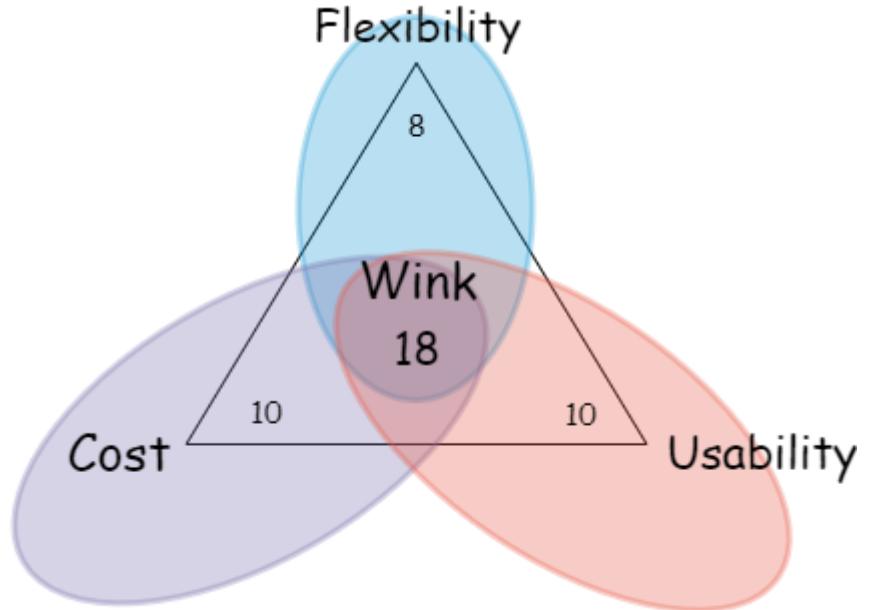
- Some examples of similar applications:
 - Insteon
 - Wink hub 2
 - Samsung smart things



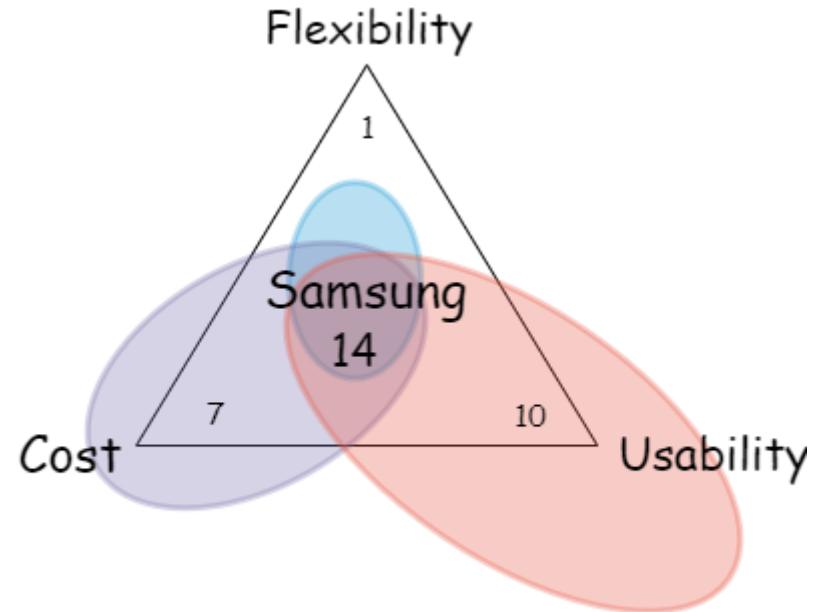
Related Work - Insteon



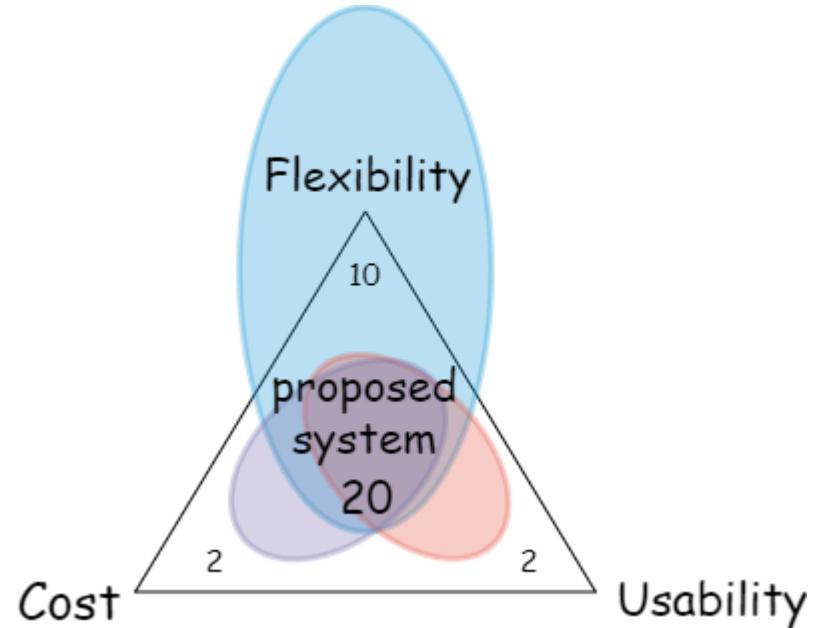
Related Work - Wink



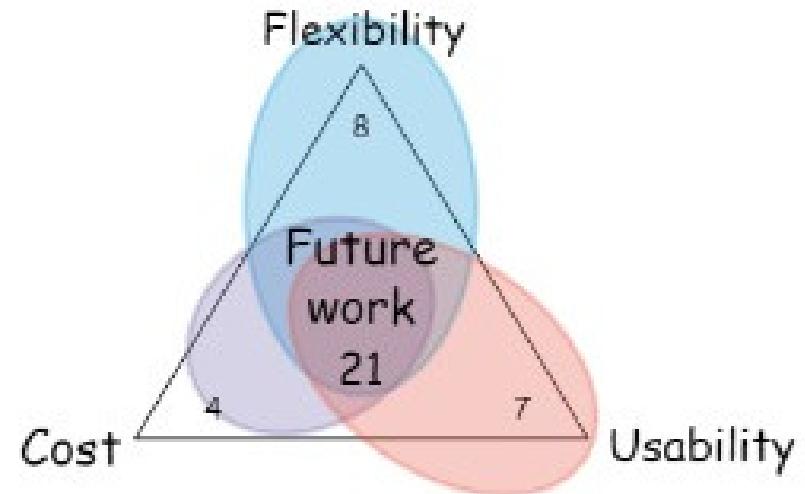
Related Work - Samsung



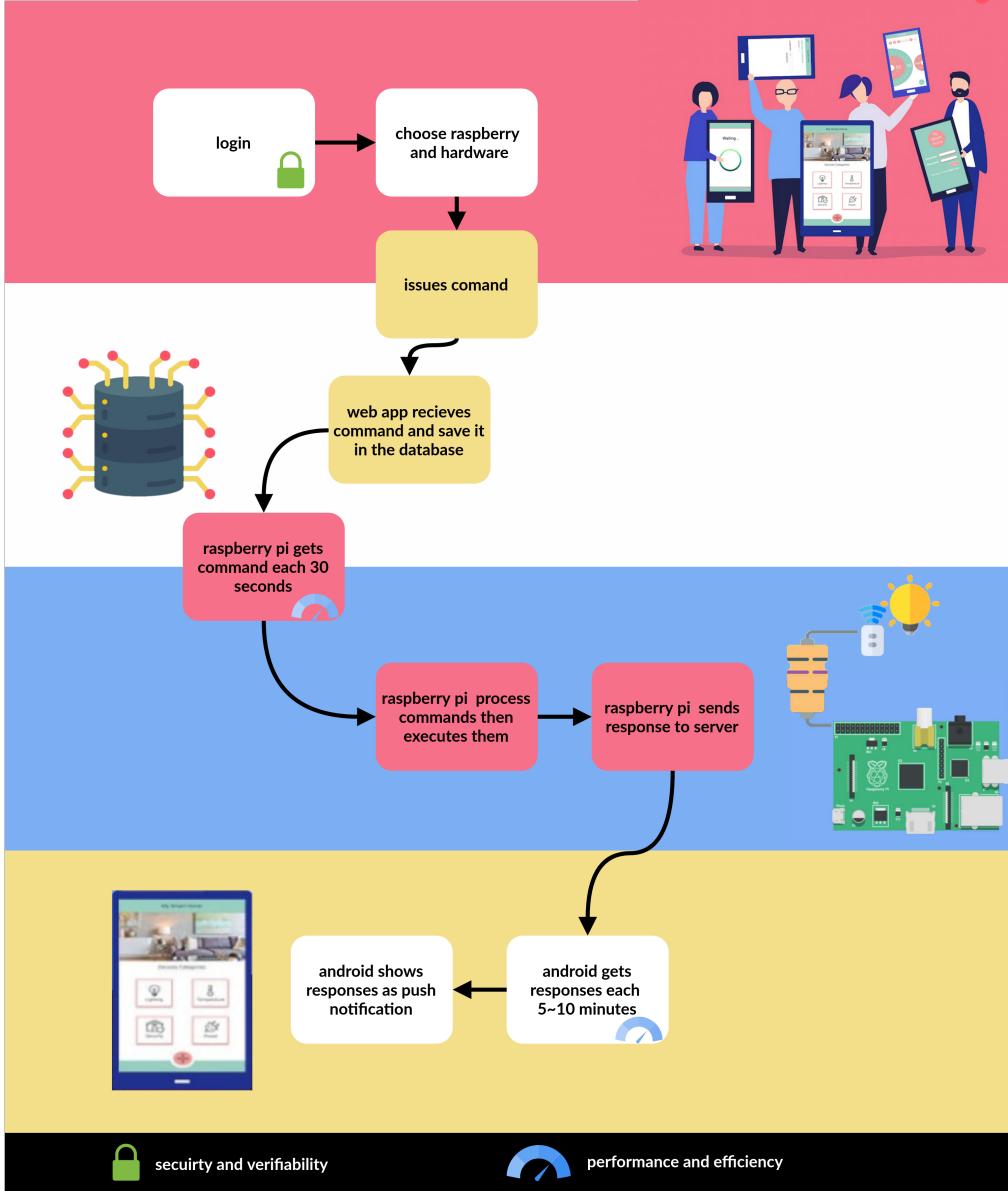
Related Work - Proposed

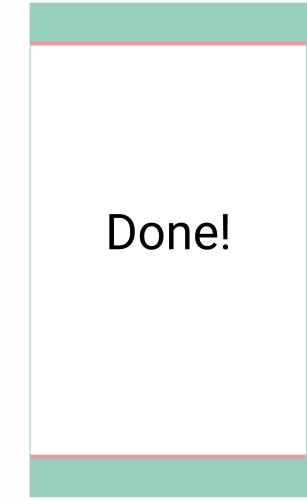
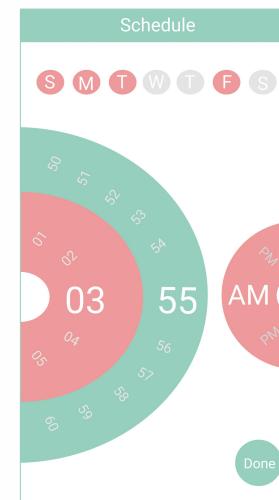
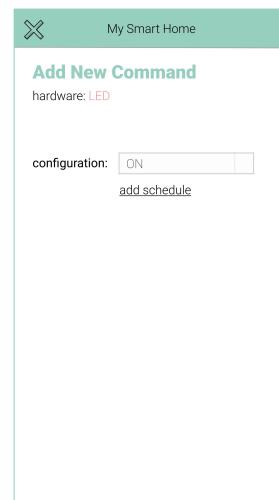
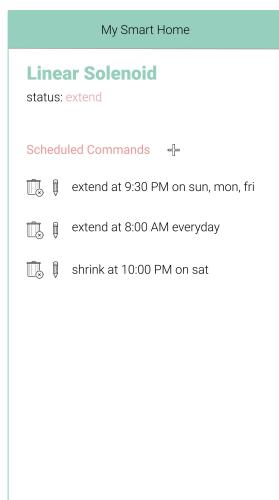
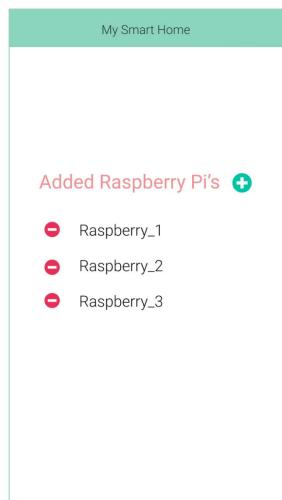
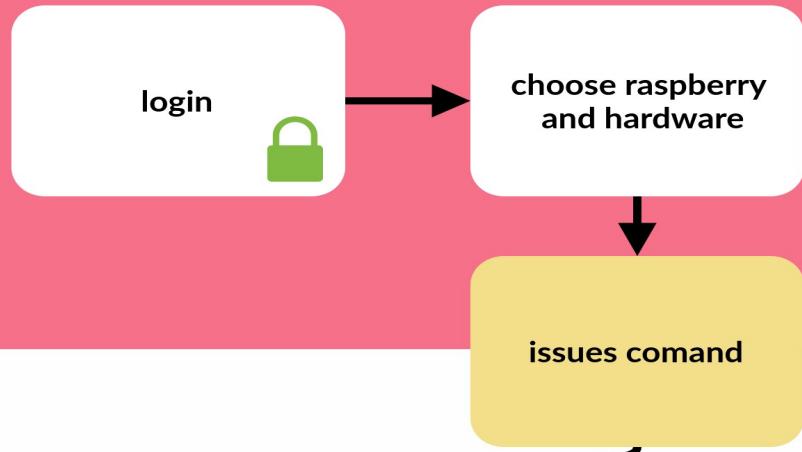


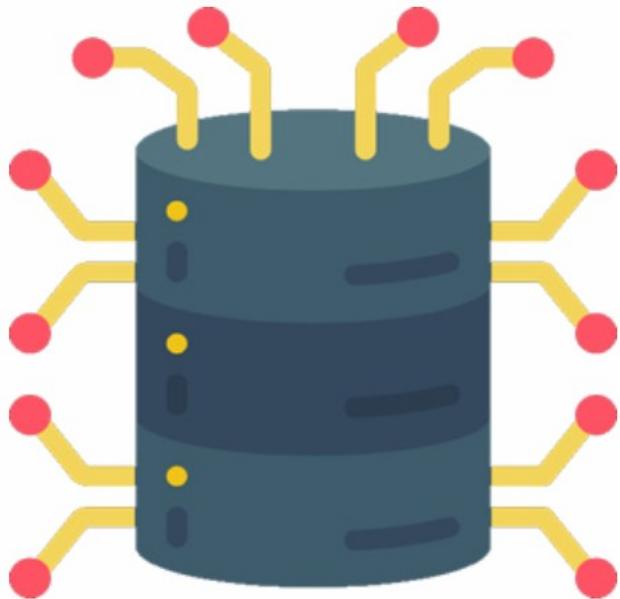
Related Work - Future



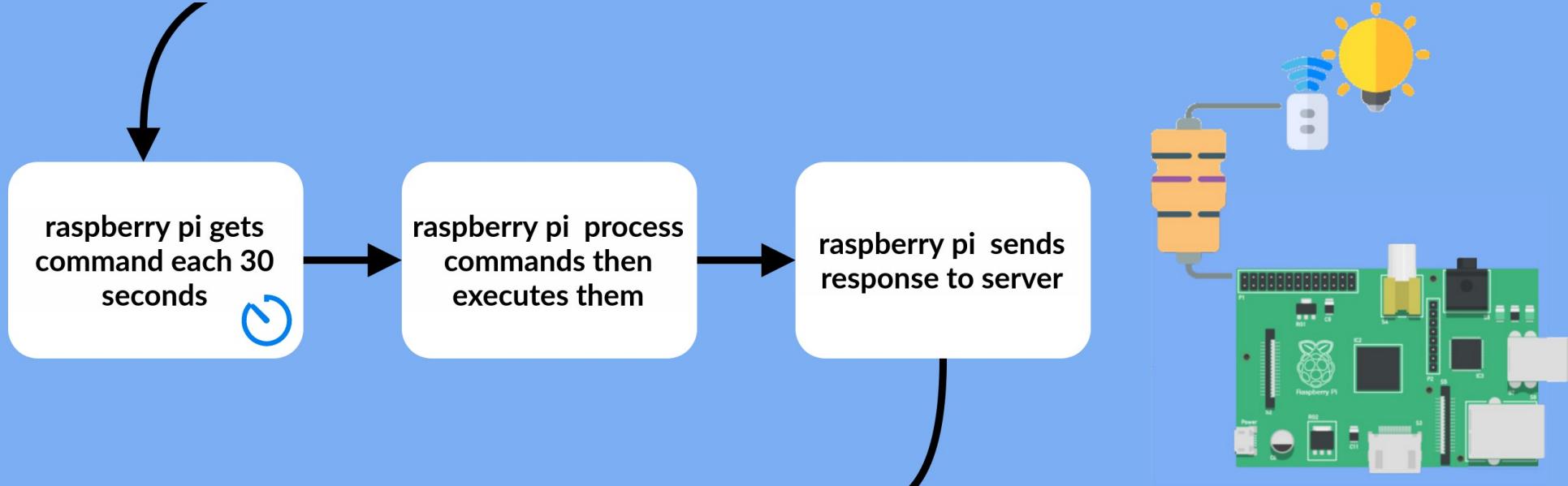
Methodology

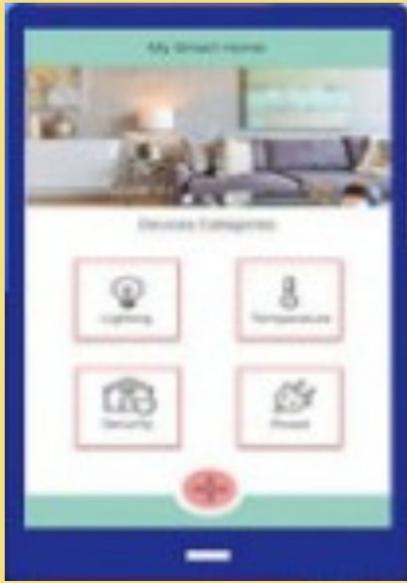






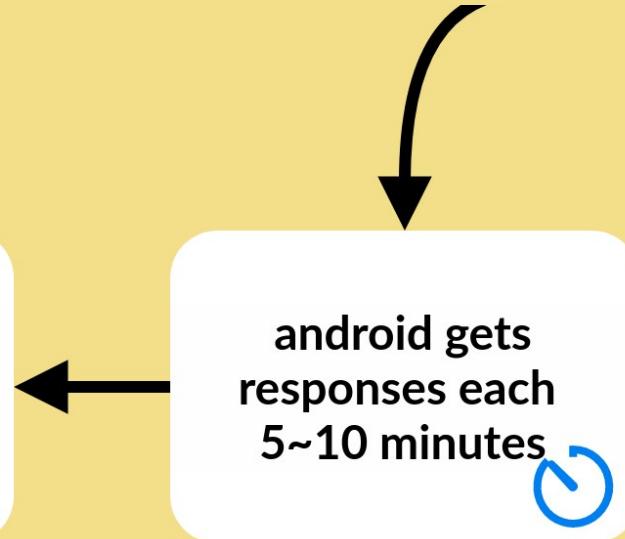
**web app receives
command and save it
in the database**



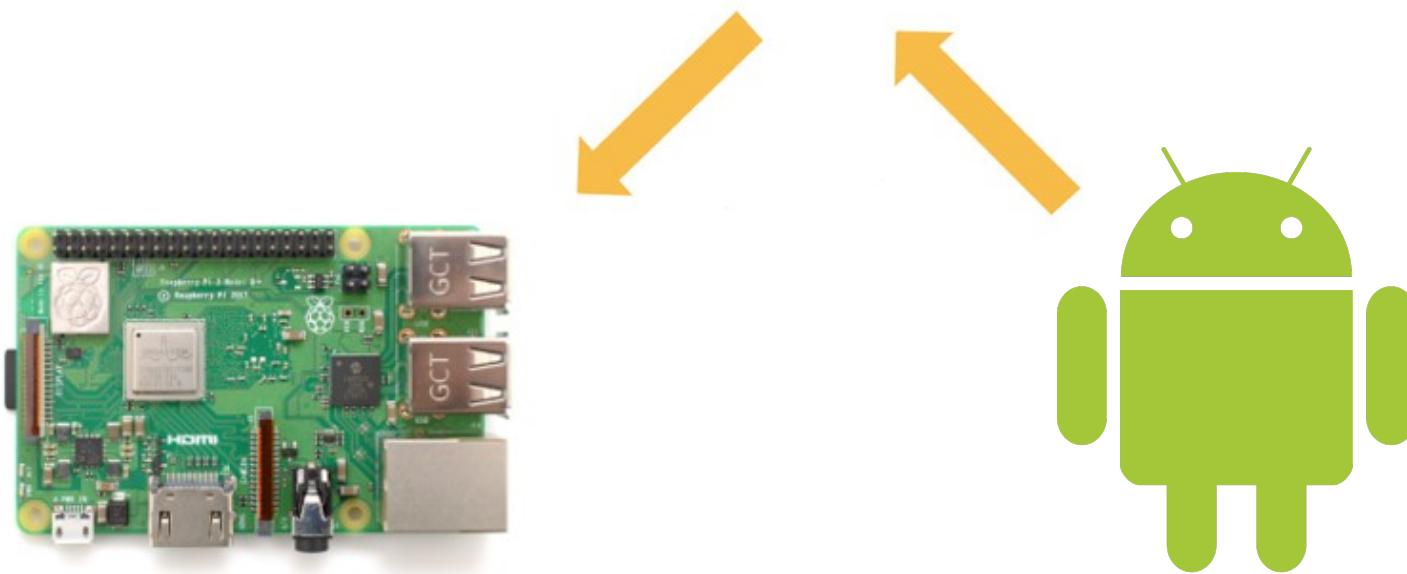


android shows
responses as push
notification

android gets
responses each
5~10 minutes



Implementation





DigitalOcean

```
1 server {
2     listen 80;
3     server_name gp.reem-codes.com;
4
5     location / {
6         include uwsgi_params;
7         uwsgi_pass unix:/home/gin/gp_api/gp.sock;
8     }
9 }
10 }
```

PROJECTS

- Gin !
- + New Project

MANAGE

- Droplets
- Kubernetes
- Volumes
- Databases

Create new record

A AAAA CNAME MX TXT NS SRV CAA

-

Use @ to create the record at the root of the domain or enter a hostname to create it elsewhere. A records are for IPv4 addresses only and tell a request where your domain should direct to.

HOSTNAME

Enter @ or hostname

WILL DIRECT TO

Select resource or enter custom IP

TTL (SECONDS)

Enter TTL
3600

Create Record

gin@reem:~/gp_api\$

File Edit View Search Terminal Help

* Environment: production

WARNING: This is a development server. Do not use it in a production deployment.

Use a production WSGI server instead.

* Debug mode: off

* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)

^C(venv) gin@reem:~/gp_api\$ nano wsgi.ini

(venv) gin@reem:~/gp_api\$ nano /etc/systemd/system/gp.service

(venv) gin@reem:~/gp_api\$ pwdir

No command 'pwdir' found, did you mean:

Command 'owdir' from package 'ow-shell' (universe)

pwdtr: command not found

(venv) gin@reem:~/gp_api\$ pwd

/home/gin/gp_api

(venv) gin@reem:~/gp_api\$ nano /etc/systemd/system/reem.service

(venv) gin@reem:~/gp_api\$ nano /etc/systemd/system/gp.service

(venv) gin@reem:~/gp_api\$

(venv) gin@reem:~/gp_api\$ sudo nano /etc/systemd/system/gp.service

(venv) gin@reem:~/gp_api\$ sudo systemctl start gp

(venv) gin@reem:~/gp_api\$ sudo systemctl enable gp

Created symlink from /etc/systemd/system/multi-user.target.wants/gp.service to /etc/systemd/system/gp.service.

(venv) gin@reem:~/gp_api\$ sudo nano /etc/nginx/sites-available/gp

(venv) gin@reem:~/gp_api\$ sudo nginx -t

(venv) gin@reem:~/gp_api\$ sudo nginx -g "daemon off;"

(venv) gin@reem:~/gp_api\$ curl -s http://gp.reem-codes.com | grep "Hello, world!"

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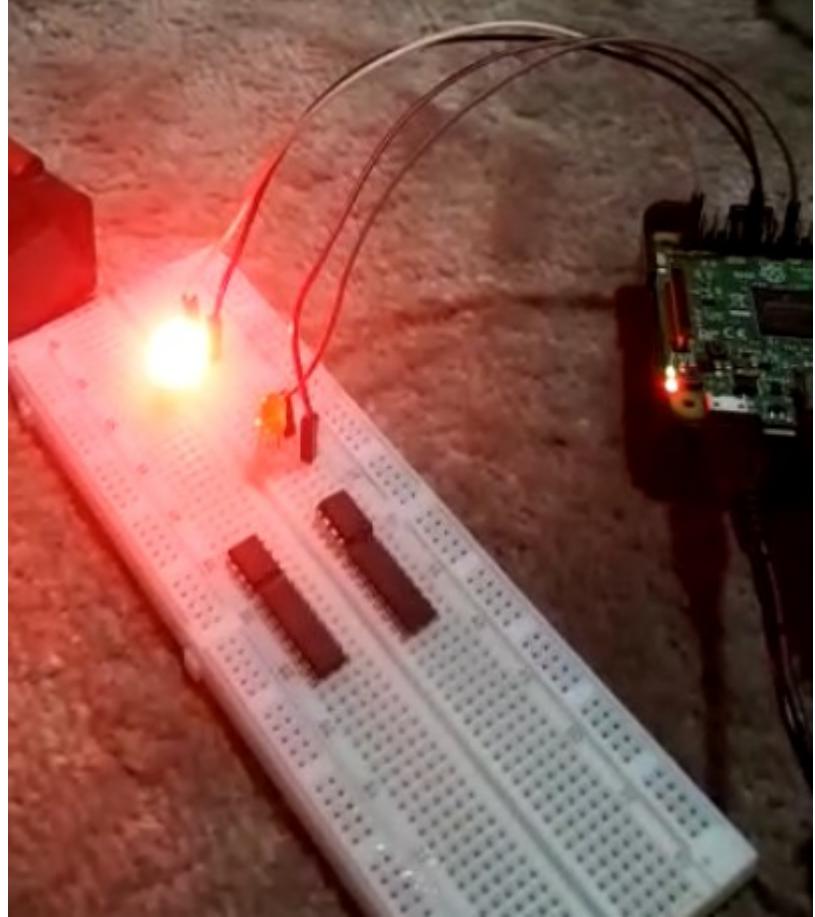
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```
Total 4 (delta 3), reused 0 (delta 0)
remote: Resolving deltas: 100% (3/3), completed with 3 local objects
To https://github.com/reem-codes/gp_rp.git
  d92cd75..cc6093a master -> master
pi@gin:~/Desktop/gp_rp $ python main.py
6
eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJpVXQiOjE1ODI1MzQ0
xpQeoPHQxyYu6YTatg47Z33D1RINDH3E6bL6qI38
{"schedule": {"time": "1:45 PM", "updateAt": "Thu, 27
0:47:18 GMT", "id": 37}}
I'm executing..
(11, True)
main.py:17: RuntimeWarning: This channel is already in use
  GPIO.setup(_gpio, GPIO.OUT)
{"message": "resource added successfully", "object": {"u
12:09:40 GMT", "id": 48, "isDone": True, "command_id": 1
{"message": "resource updated successfully", "object": {"id": 14, "raspberry_id": 6, "icon": "light"}}
```

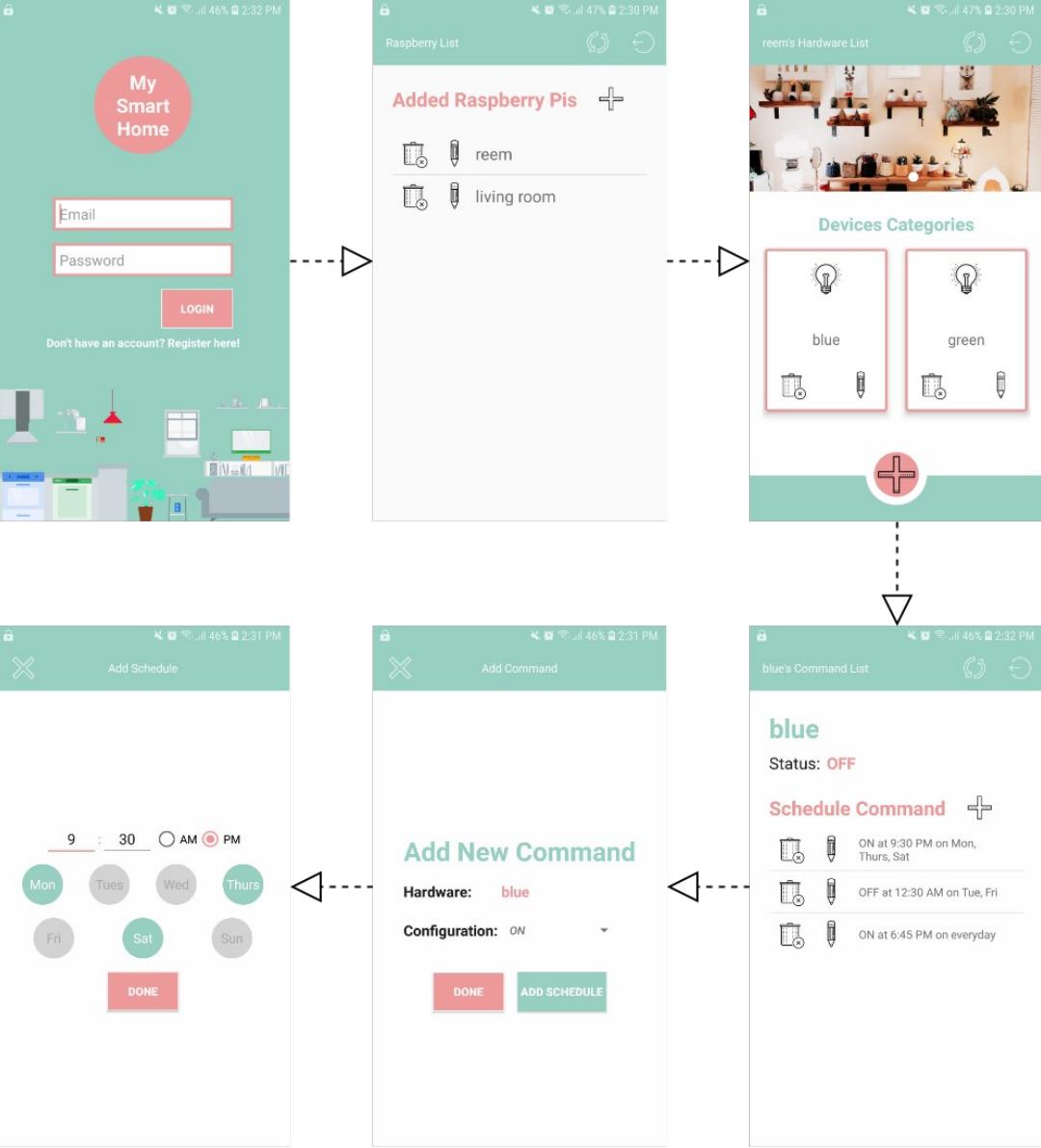




⚙️ My Smart Home • Just now ^

Command executed successfully

command executed successfully
Thu, 27 Feb 2020 15:11:57 GMT



Testing and Validation - Validation

resource updated successfully

resource deleted successfully

Schedule added

You must enter a password

Bad email or password

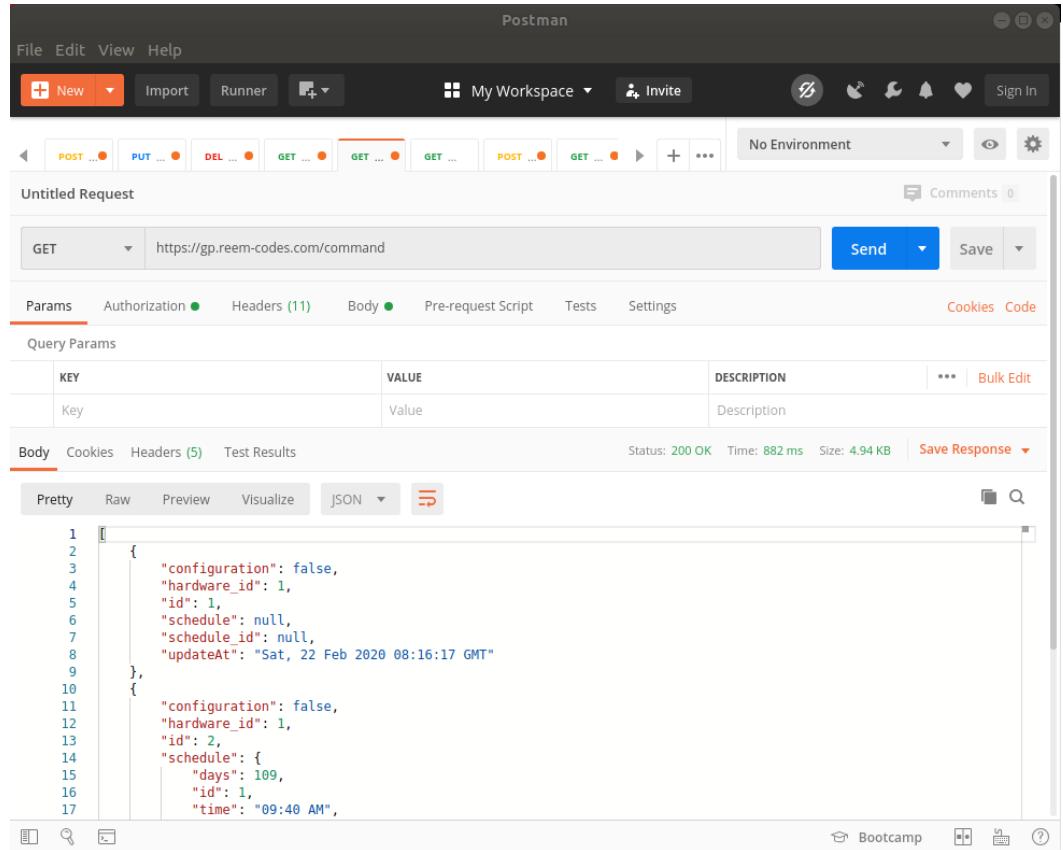
email is incorrect

please check network and try again

user cancelled

Testing and Validation - Testing

No.	Function	Input	Expected Output	Resulting Output
1	Login	email and password	If exists in the database and credentials correct, go to raspberry pi's activity.	Display raspberry pi's activity.
2	Adding a resource	resource attributes	Add a new resource if data is in the right format and required fields are filled.	Return successfully added message
3	Editing a resource	resource id and its attributes	Edit resource if id is correct and data is in the right format and required fields are filled.	Return successfully edited message
4	Deleting a resource	resource id	Delete resource if id is correct.	Return successfully deleted message

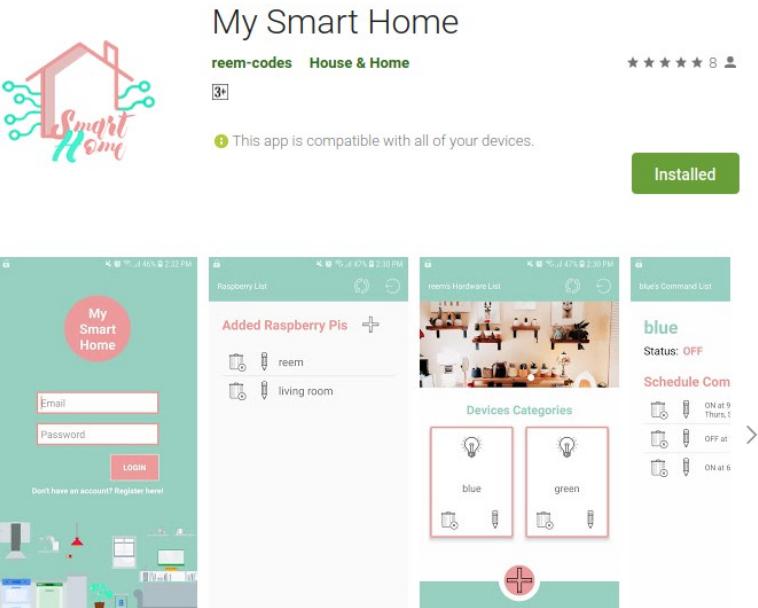


Testing and Validation - Testing

Requirement	Success	Failure	Description
User login or register	✓		validation and authentication are implemented too.
Manage resources	✓		a user can get, delete, create and edit each of the following: raspberry pi, hardware, command and schedule.
Receive Responses	✓		Response service pulls responses from the server each 5 minutes and show them in the notifications.

Requirement	Success	Failure	Description
Get command list	✓		raspberry pi read commands each 30 seconds.
Update local queue	✓		The local queue was replaced by a list for faster implementation
Execute commands saved in queue	✓		Raspberry pi execute commands accordingly
Submit a command response to server	✓		Once done, a response is POST to the server

Deployment - Android



This is my graduation project. It is a system that aims to control any hardware online as long as it is connected to a registered raspberry pi.

ABSTRACT:

With the recent very rapid progress in technology and automation, and towards easier daily life tasks, there has become a need for remote control of almost all possible aspects of living. Some examples

[READ MORE](#)

A screenshot of the Google Play Console. At the top, it says 'Google Play Console' and 'All applications'. There is a search bar and a 'CREATE APPLICATION' button. On the left, there are navigation links: 'All applications', 'Game services', 'Download reports', 'Alerts', and 'Settings'. In the center, there is a message: 'Due to adjusted work schedules at this time, we are currently experiencing longer than usual review times. Please expect review times of 7 days or longer.' Below this, there is a table with the following data:

App name	Active installs	Google Play rating	Last update	Status
My Smart Home  com.reem_co...	7	★ 5.00	Mar 24, 2020	Published

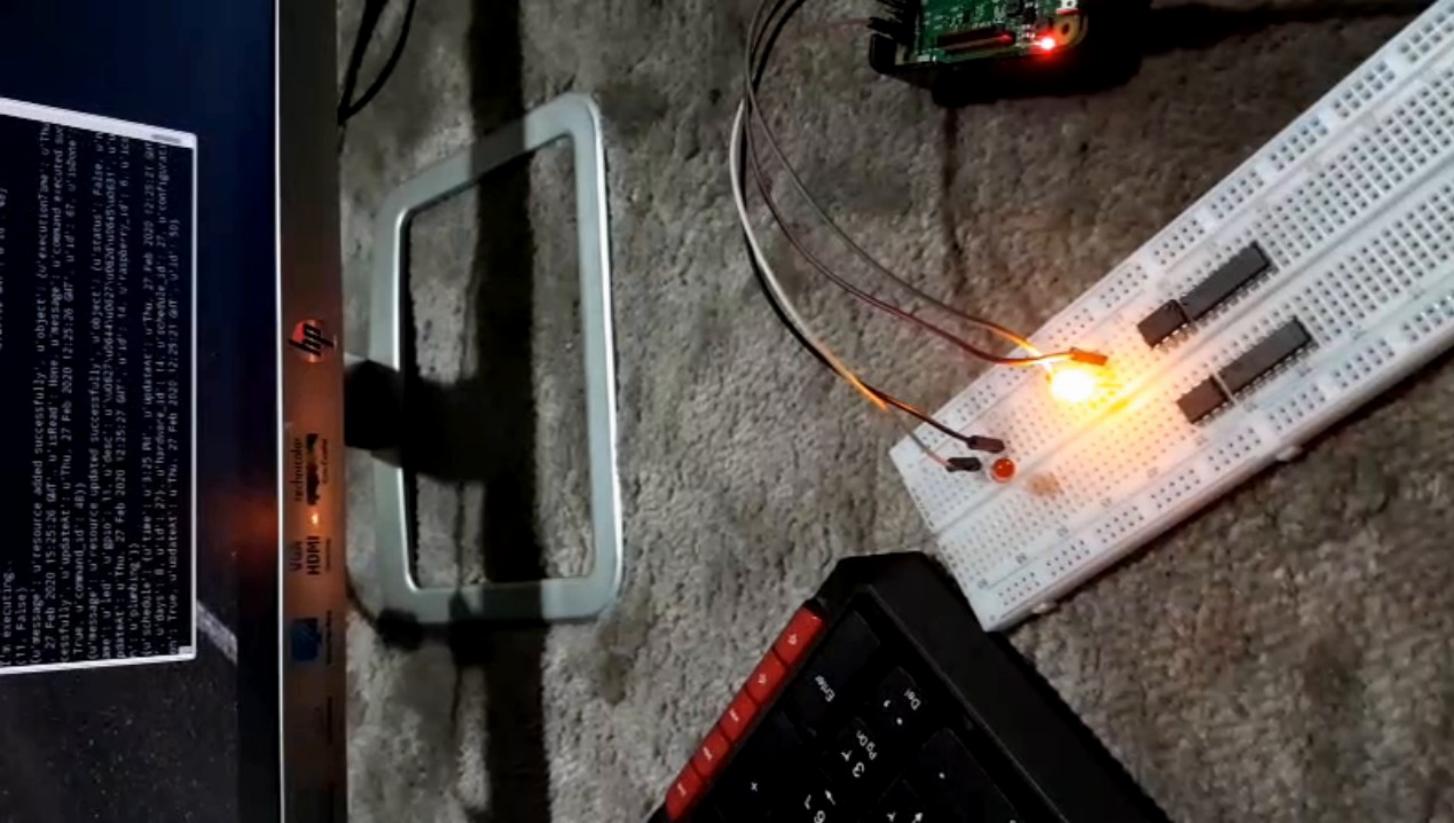
https://play.google.com/store/apps/details?id=com.reem_codes.gp_android



Deployment – Web Application

<https://gp.reem-codes.com/>

Conclusion - Evaluation



Conclusion – Problems Faced

- Time management: making 3 applications
- Configuring the server
- Publishing application to google play

Conclusion – Future Work

- Add configuration table
- Test on multiple devices
- Make an iOS version

THANK YOU!

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- 437004005 Mona Saud AlKhathlan
- 437004100 Nouf Abdullah AlDajani
- 437004875 Reem Ali AlGhamdi
- 436006939 Sarah Khalid AlHussain

