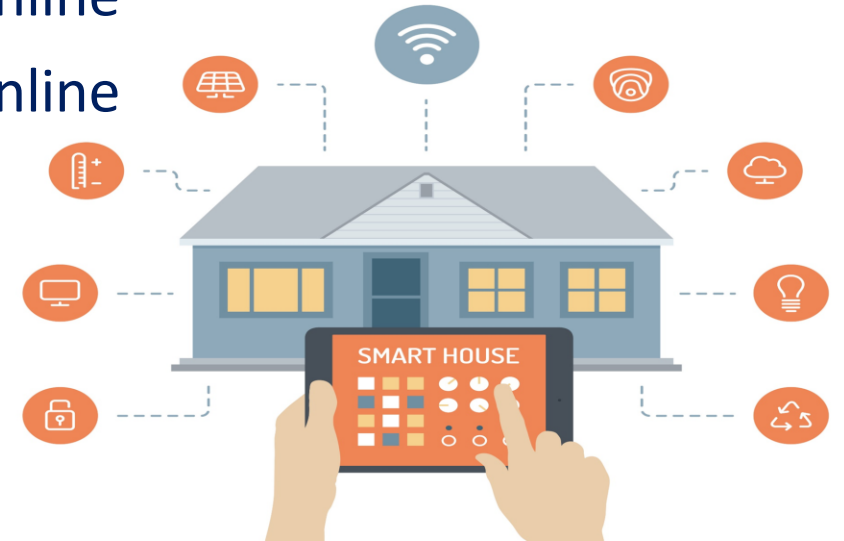


Smart Home

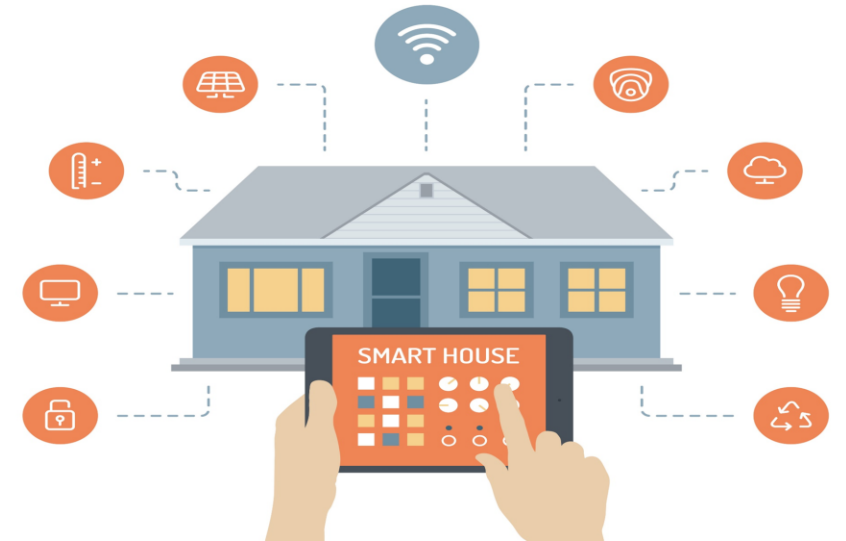
Mohamed Mohamed Mohamed Hassen
Yousef Mohamed Mohamed Ahmed
Mohamed Orabeya

Q9-Online
Q9-Online
Q9-Online



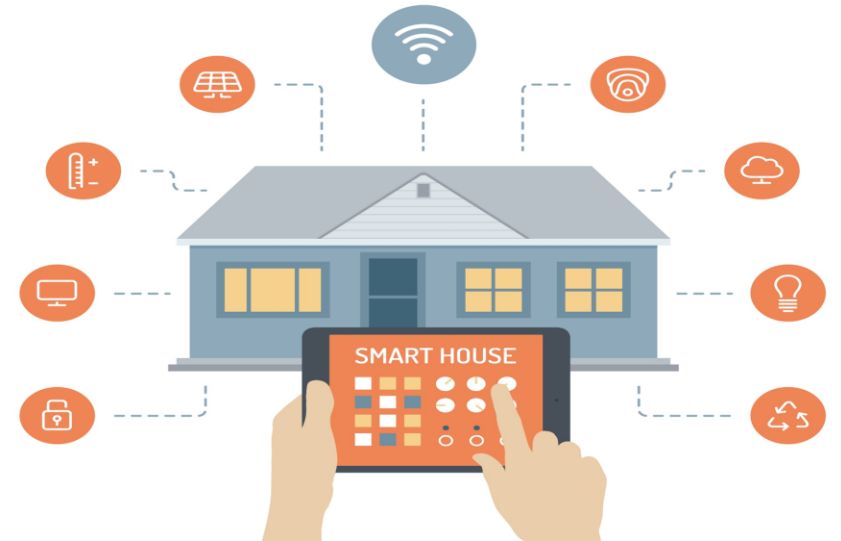
Outlines

1. Problem statement
2. Problem solving
3. System construction
4. System instruction
5. Flow chart
6. Architecture
7. Simulation
8. GitHub Repo Link



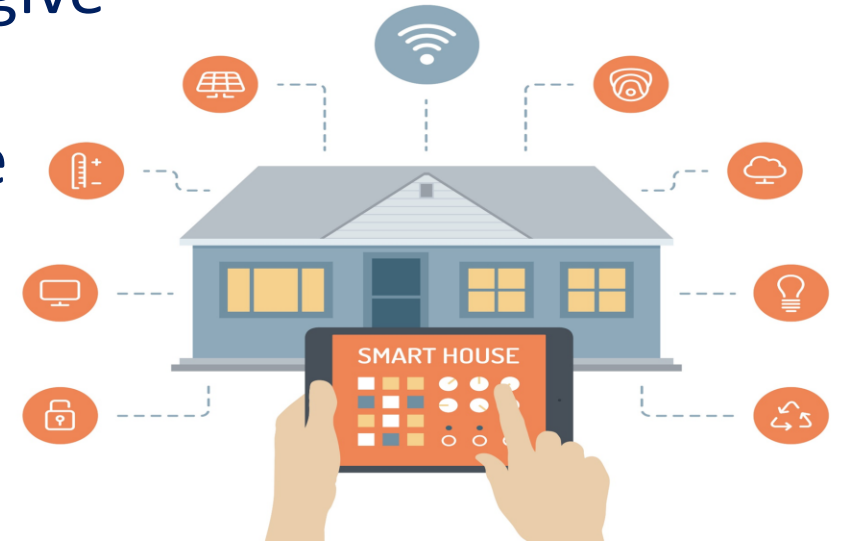
Problem statement

- Our traditional homes are suffers from lack in communication between the home and its resident.
- No feedback if something went wrong as:
 1. The door is closed or not .
 2. Fire alert during work.
 3. Forgetting the Ac on for a long time.
 4. Anonymous person enters the home while you not existing there.



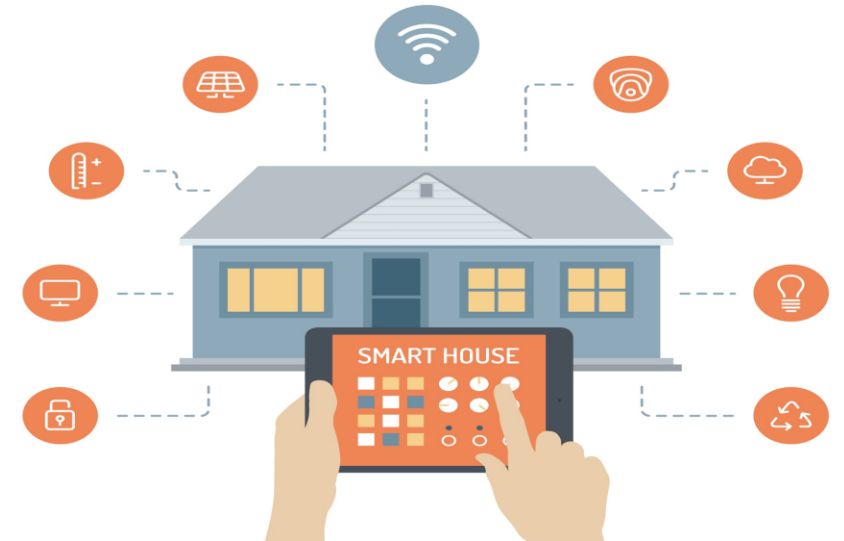
Problem solving

- Smart home is the brilliant solution for all the previous information.
- Smart home provide an access to the resident to check the at anytime & everywhere.
- Smart home includes some sensors that fix the previous problems:
 1. Door sensor: to check whether the door is closed or not.
 2. Fire sensor is connected to LAN network to give you a mobile alert notification.
 3. Schedule notification to remind you that the AC is working.
 4. Internal cameras and sensors to avoid theft.

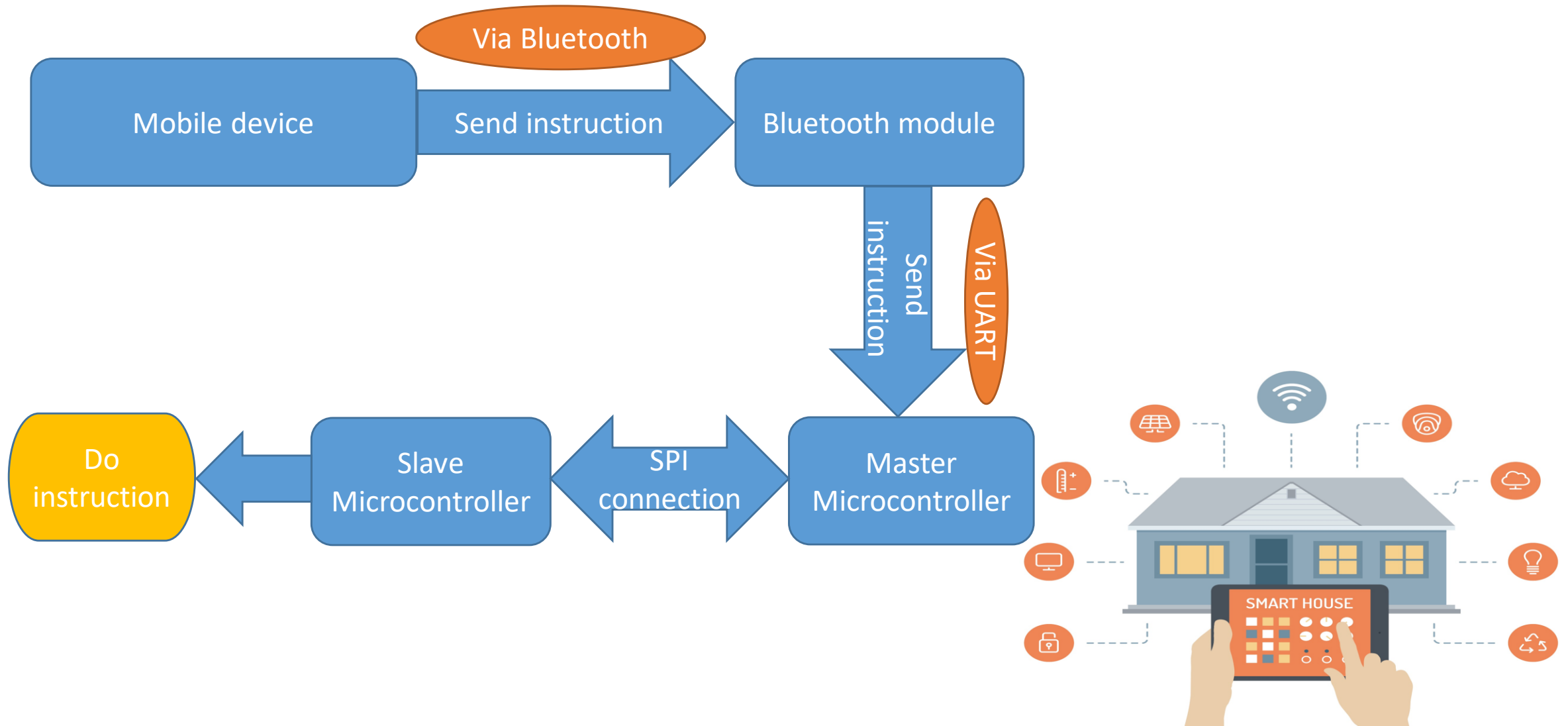


System construction

- System is consists of 2 microcontroller an Bluetooth module.
- Our system is based on Bluetooth connection between a mobile device and master microcontroller.
- Master microcontroller send instruction to the slave one.
- The sent instruction is based on the instruction sent by the user via Bluetooth.

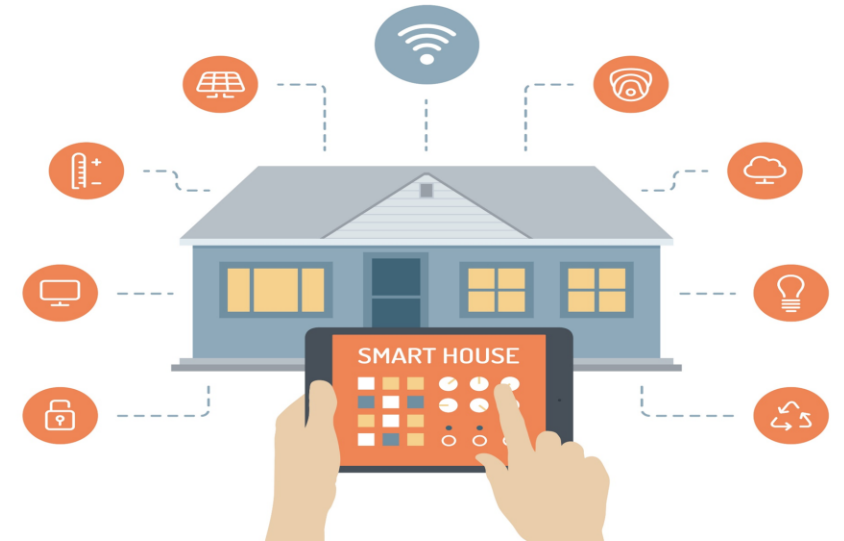


System construction



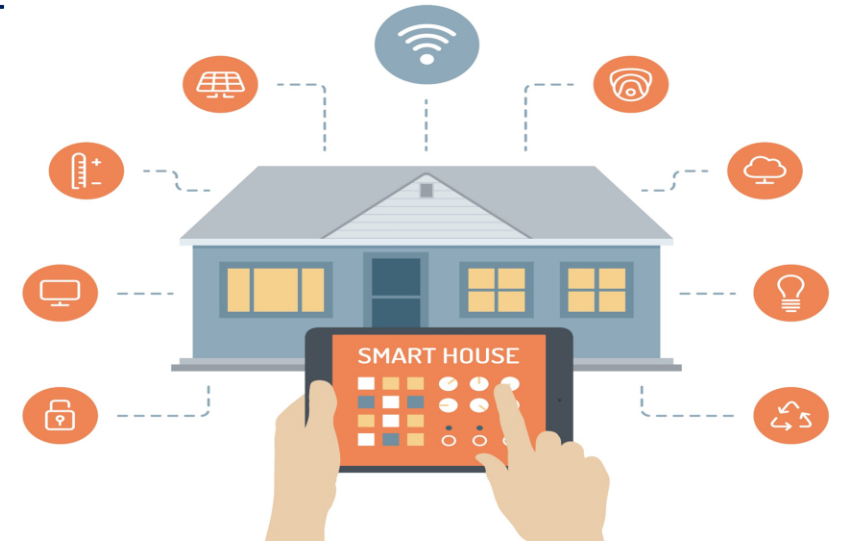
System instruction

- System has 2 outputs: AC and light system.
- Output form is based on the instruction sent from mobile device.
- Instructions are:
 - 1) TURN AC ON ONLY.
 - 2) TURN AC OFF ONLY.
 - 3) TURN LIGHT ON ONLY.
 - 4) TURN LIGHT OFF ONLY.
 - 5) TURN ON BOTH.
 - 6) TURN OFF BOTH.



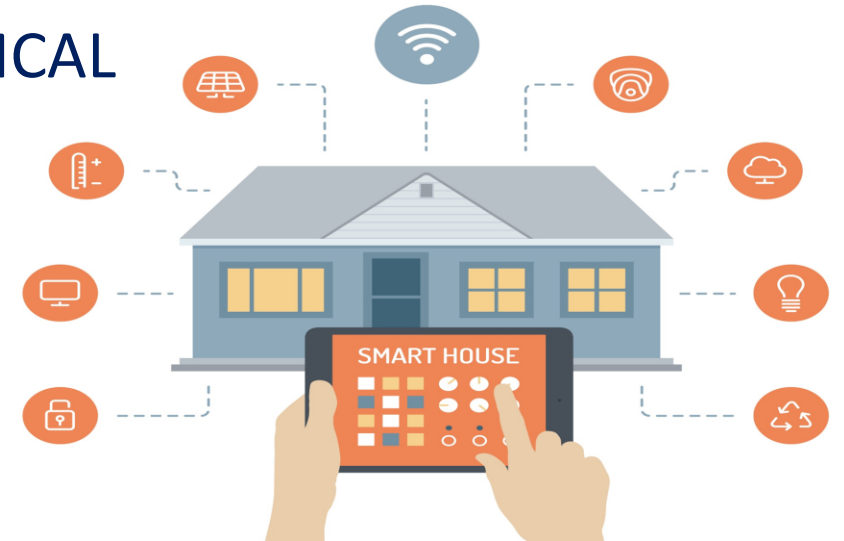
System instruction

- Instructions description :
 - 1) TURN AC ON ONLY : master send address 0x10 to slave microcontroller, so the slave microcontroller will turn on the AC only.
 - 2) TURN AC OFF ONLY : master send address 0x20 to slave microcontroller, so the slave microcontroller will turn off the AC only.
 - 3) TURN LIGHT ON ONLY : master send address 0x30 to slave microcontroller, so the slave microcontroller will turn on the light only.
 - 4) TURN LIGHT OFF ONLY : master send address 0x40 to slave microcontroller, so the slave microcontroller will turn off the light only .
 - 5) TURN ON BOTH : master send address 0x50 to slave microcontroller, so the slave microcontroller will turn on both AC and light.
 - 6) TURN OFF BOTH : master send address 0x60 to slave microcontroller, so the slave microcontroller will turn off both AC and light.

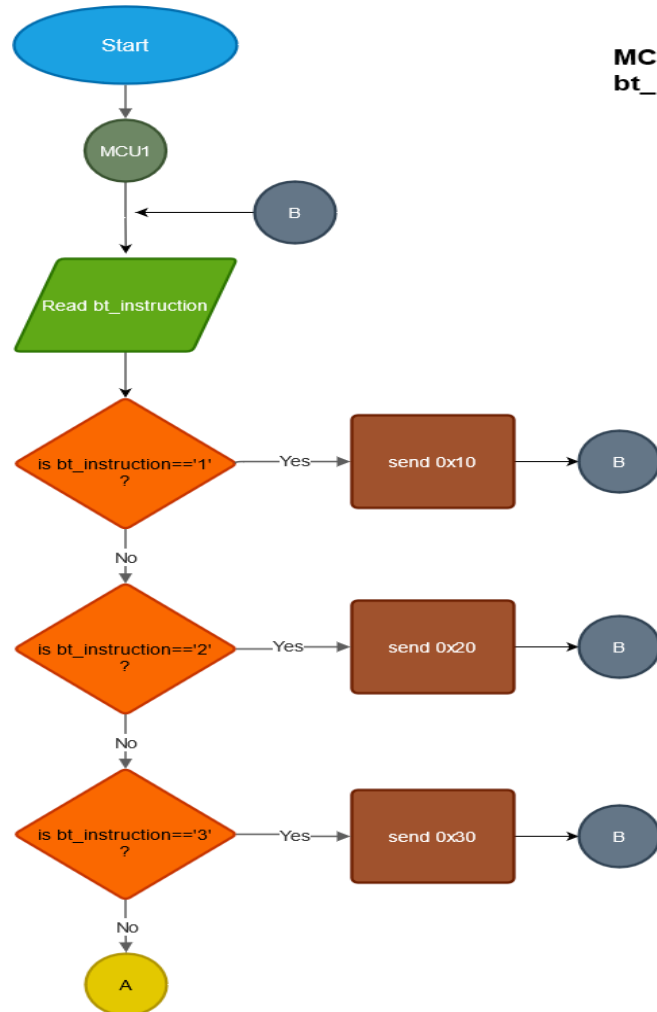


Architecture

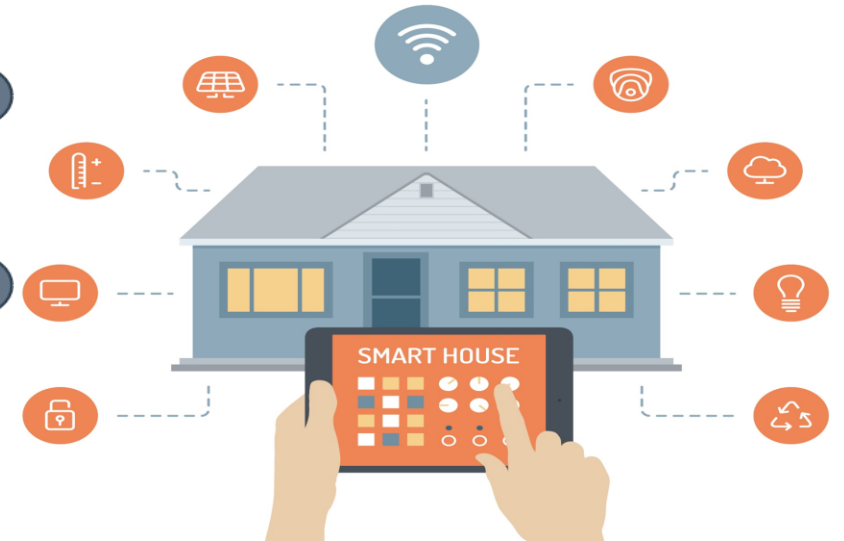
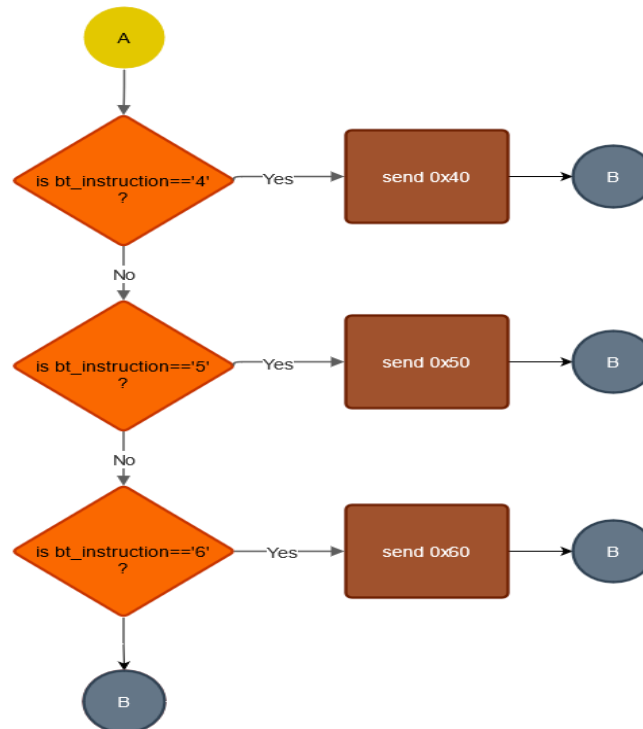
- Our design based on layered Architecture for each microcontroller.
- Master microcontroller has 3 software module of MCAL(microcontroller abstraction layer):
 1. Input / output module.
 2. SPI module.
 3. UART module
- Slave microcontroller has 2 software module of MCAL (microcontroller abstraction layer):
 1. Input / output module.
 2. SPI module.



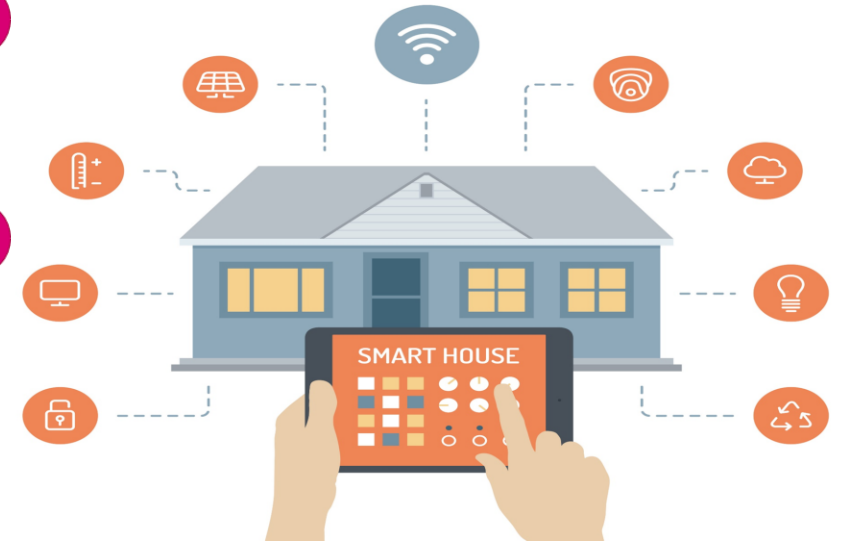
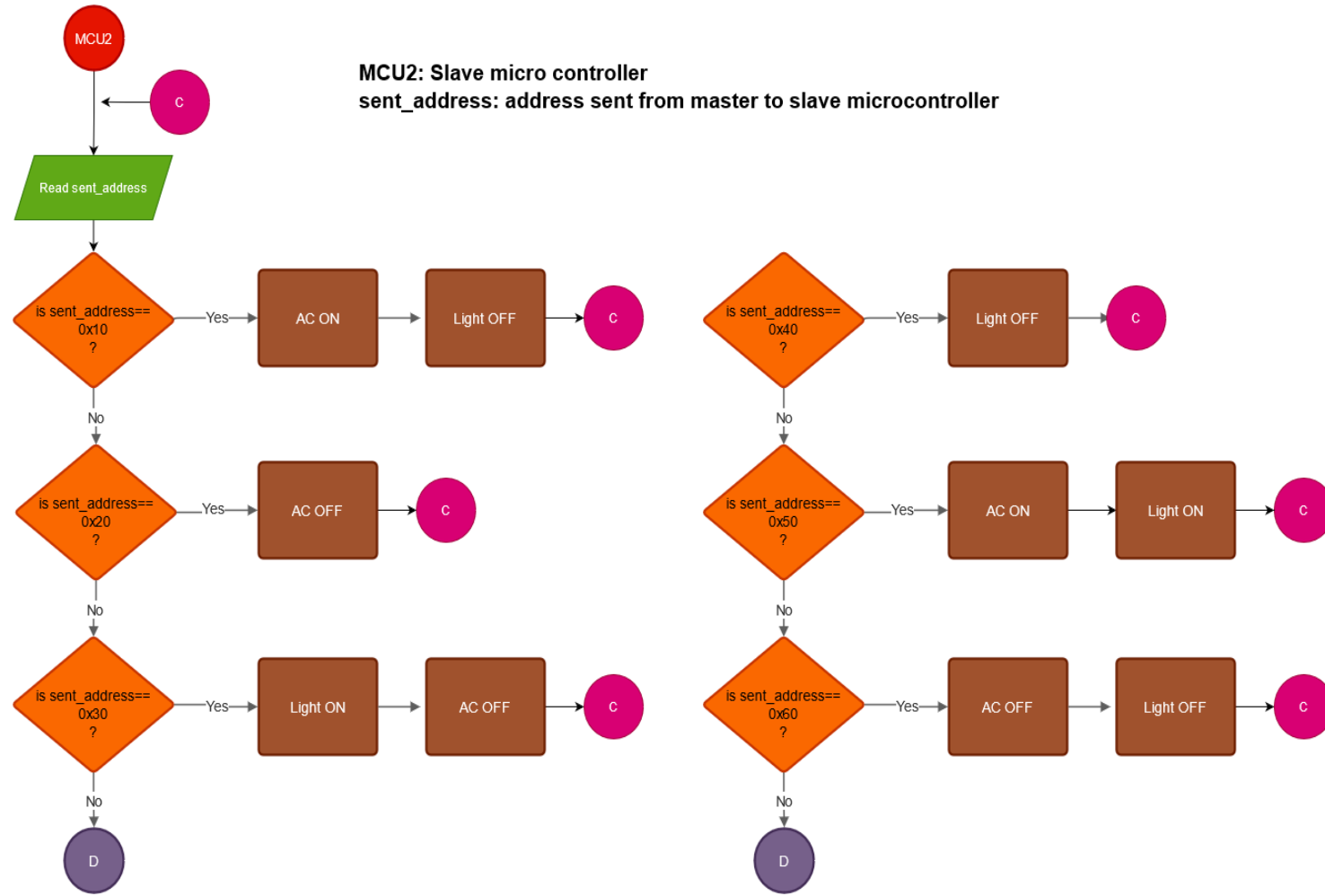
Flow chart



MCU1:Master micro controller
bt_instruction:instruction sent from Bluetooth module

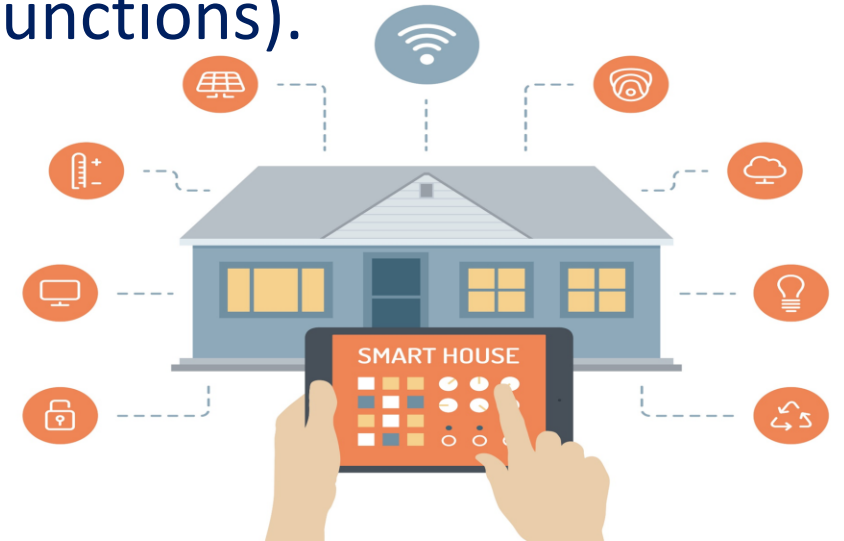


Flow chart



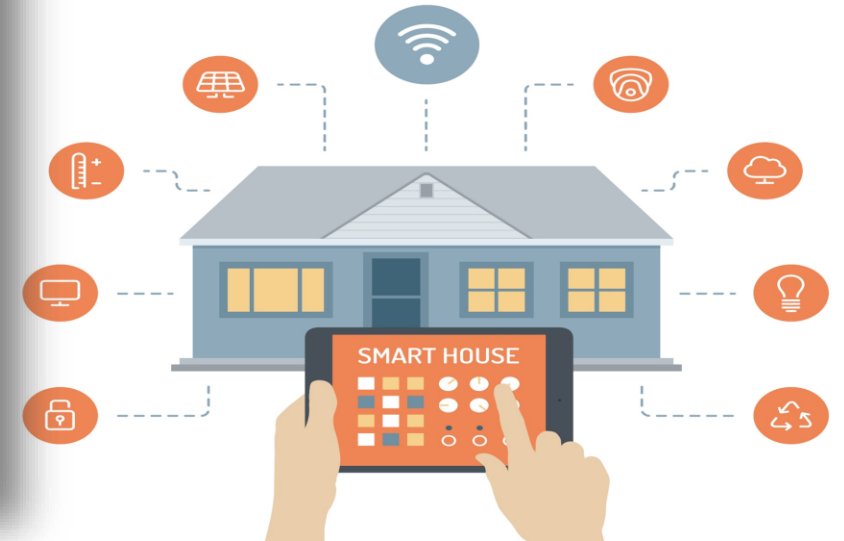
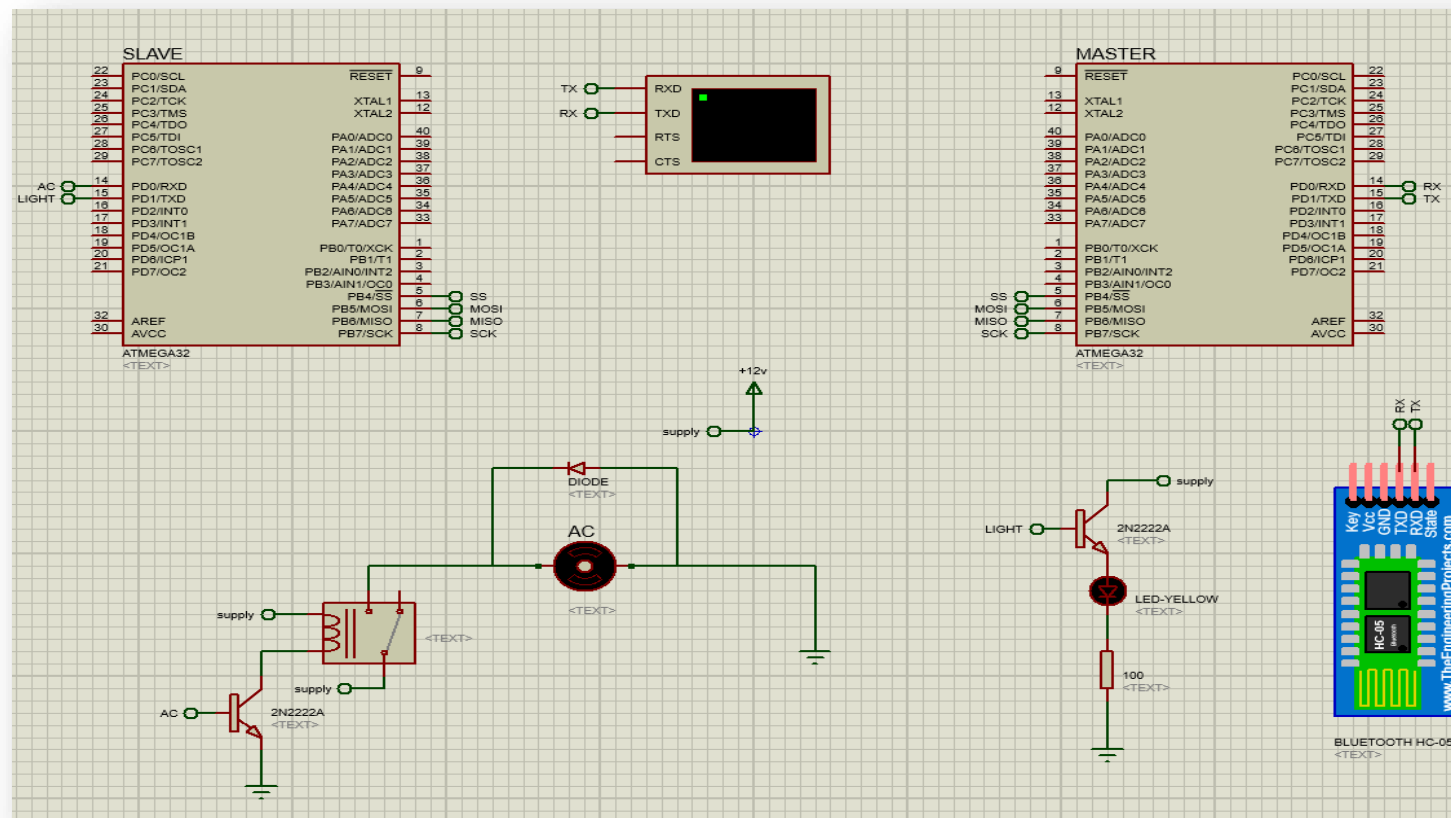
Architecture

- Each software module is composed of 3 files:
 1. Private.h (contains private information that can't be shared with the user).
 2. Interface.h (contains information as prototypes, macros & function used).
 3. Program.h (contains main logic of the used functions).
- The main code includes the interface files of each module in order to be called.



Simulation

- System simulation is done by PROTEUS simulation in order to test whole the system. (check the PROTEUS file for real-time simulation)



GitHub Repo Link

- Mohamed Hassen's link:

❖ <https://github.com/Muhamed1470/smart-home.git>

- Yousef Mohamed's link:

❖ <https://github.com/yousefmohammed98/smart-home.git>

- Mohamed Orabeya's link:

❖ <https://github.com/Orabya/Smart-home.git>

