X-IOTA

Round - 1

"Smart Living Challenge: Simulating the Future Home"

Welcome to the "Smart Living Challenge," a thrilling event where participants will immerse themselves in the world of smart home technology. In this simulation, teams are tasked with developing and implementing a cutting-edge smart home system for a 1-bedroom apartment with a hall and kitchen. The goal is to create a seamless and secure living environment by incorporating enhanced door security systems, motion detector sensors, LEDs in every room, and a centralized fire detector. Additionally, teams must integrate a common 20x4 LCD display that dynamically showcases all activities within the house, specifying the room where each activity is occurring.

Task:

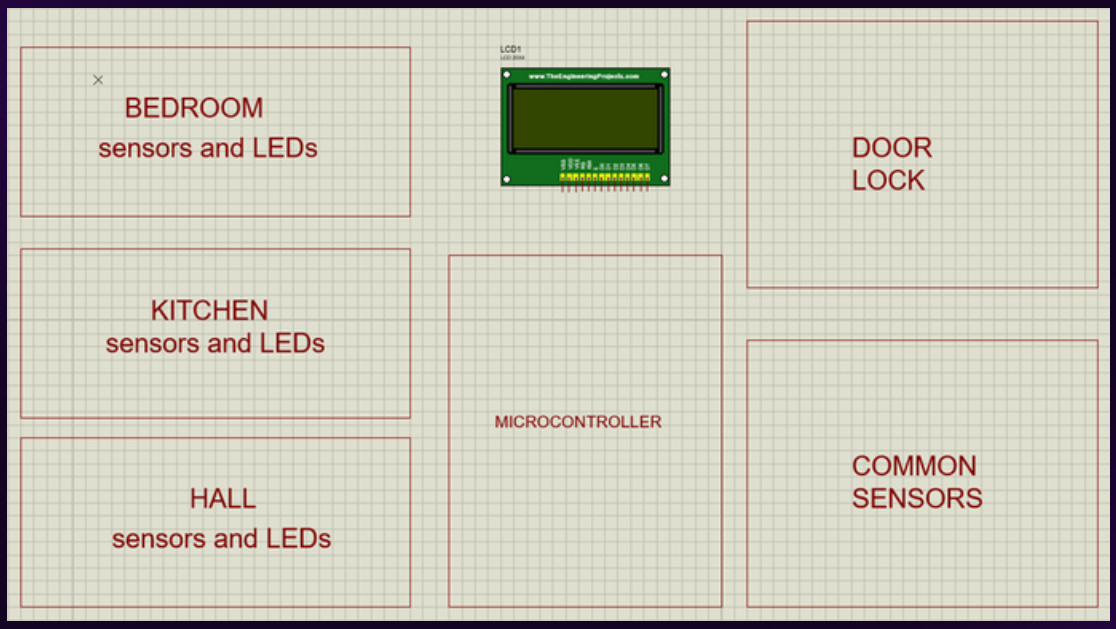
Develop a system which has the following features:

Enhanced Door Security System specifications:

- It should have an LCD display 16x2, a keypad, a motion detector sensor, and a servo motor.
- How should it function?
  a. Show the "Enter Pwd:" message on the LCD when someone comes close.
  b. It should take input from the user and display an asterisk (*) for input.
  c. The Pwd should be a 4-digit number.
  d. The display should show "Welcome" or "Incorrect Pwd" for the input.
  e. Once the correct password is entered, the servo should turn precisely 180 degrees to show the door unlocking and turn the servo back after a set amount of time.

Smart Home System Specifications:

- It should detect in which room the person has entered and turn on the light autonomously. The LCD should display in which room the person is present.
- It should be able to detect fire in the house and send an SOS message to the nearby fire station for emergency purposes along with necessary information like address.
- The LCD at this moment should also display an "Emergency! Calling Fire-Station" message.



A possible example of Arrangement of Sensors and systems

Actions On the Blynk Cloud:

- A text box showing in which room the person is present.
- The door could be opened using a button on the blink software.
- Room lights can be turned on using buttons on the mobile application or the web version of blynk.

Optional Add-ons:

Enhanced Door Security System specifications:

- An RFID Card Reader for security purposes.
- Any other features that you feel are necessary?

Smart Home System Specifications:

- It should be able to detect if there is fire in the room and respond accordingly by turning on the water flow system.
- Simulation of the water flow system should be shown by turning on motors.
- Safety Arrangement like Buzzers.
- The LCD should also display whatever actions the system is performing:
  - If there is fire, then it should show fire in this room (Can be done by putting fire detectors in each room) and "Putting Out Fire…" and "Calling fire-station" messages.
  - Any other necessary data.

Actions On the Blynk Cloud:

- A mobile or web application dashboard focused displaying any sort of live data received from devices in a form that it handy and user-friendly to the user.

Guidelines:

1. You are free to use any simulation platform, Proteus or Tinker cad.
2. You can use any microcontroller board and their respective modules and sensors as you may wish to carry out the requirements.
3. Any extra features you implement should be clearly elaborated in your report. Optional features, apart from basic requirements also carry significant weightage in evaluation.
4. For connectivity you can use WIFI, XBee, Bluetooth or any other technologies.
5. You should include a detailed report, which includes all the functionalities that you have implemented, information about all the boards, sensors, modules and all other components along with their labelled pictures. This should also function as a user manual for your device.
6. Your report should also include the approximate cost of the device based on the price of the required components found online.
7. Teams that complete at least the basic requirements will qualify for round 2.
8. Your submissions should be unique, and organizers have right to disqualify teams that indulge in any form of cheating or malpractice. Your genuine efforts and hard work will be rewarded.

Evaluation Criteria:

The score for the IoT device developed will be awarded as follows: -

- Accuracy and completeness of the simulation model based on basic requirements. (Up to 30%)
- Implementation of any additional features. (Up to 30%)
- The quality and detail in the report writing. (Up to 10%)
- Feasibility and robustness of the prototype. (Up to 10%)
- Participation and contribution of each member of the team. (Up to 5%)
- Explanation of the working in the evaluation meet. (Up to 10%)
- Neatness and overall clear prototype design. (Up to 5%)

UDYAM'24

ANNUAL TECHNICAL FEST OF ELECTRONICS ENGINEERING SOCIETY

Submission Instructions:

- Deadline for the submission for PS-1 is:
- Each team must submit a link to a Google Drive folder (with appropriate viewing permissions) that contains:
  - The detailed report-cum-user manual for the device.
  - Short screen recording of the device in action.
  - A clear image/schematic/block diagram of the device.
  - The code you implemented for the microcontroller board.
  - All the simulation files (for e.g. The sensor libraries, modules, proteus file or Tinker cad file link, etc.)
- Only one submission per team will be accepted.
- Evaluation might be done in an online meet or an offline meet in which teams must explain the working, contribution of each member, their thought process, and answer the questions raised by evaluators.
- Evaluation will be done in on the basis of report, simulation, and explanation of the working at the time of evaluation meet.

Co-ordinators:

For any queries, please contact the co-ordinators of X-iotA event:

- **VAIBHAV BANSAL - +91-9625268535**
- **NIHARIKA SINGH - +91-9625477162**

ELECTRONICS ENGINEERING SOCIETY