**Name of Group Members:**

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**Title:**

Smart and compact electrical appliance management system through IoT (Internet of things) implementation, along with power regulation and monitoring features using high voltage semiconductor devices.

**Purpose:**

In today’s advancing world people are always on the move and security, safety and power wastage of their homes are being compromised due to it. In a bigger scenario this is alarmingly contributing towards wastage of energy resource and climate change. And one of the solutions to this problem is to monitor and control their electrical home appliances from anywhere in the world using a hand held mobile device. Nowadays, more and more people are getting easy access to the internet by using a just simple handheld mobile device. And by using it and through the power of the internet, people can always keep tabs on what appliances are running, what condition is the room in and how much power is being consumed in that particular room, all in real time.

**Features:**

* User can control their home appliances through their cell phone using an application/software.
* User will have real time data on how much power is being consumed on their mobile devices.
* Voltage regulation is possible through mobile application. For example: Dimming lights and speed regulation of a fan.
* Automatic ambient light monitoring and adjusting.
* Real time temperature and humidity sensing and monitoring through mobile application.
* Motion sensing capabilities to see if anyone is in the room.
* Appliances can be controlled from anywhere around the world.
* The unit can be implemented in an already existing traditional system.

**Application:**

* People who are out of their homes most of the time can monitor their homes in real time from anywhere in the world.
* Physically challenged people can easily control basic appliances through an already available cell phone using an application.
* Can be used in hospitals to manage certain room conditions.

**Hardware Requirements to build this project:**

* Microcontrollers.
* IoT modules.
* Zero-Crossing Detectors.
* Temperature and humidity sensors.
* Current and Voltage sensors.
* Motion detecting sensors.
* Relays and circuit breakers.
* Semiconductor based switching networks.
* DC Power supply to run the unit.

**Software Requirements to build this project:**

* Android Studio.
* Web server.

**Title**: A stick for blind people that can detect approaching objects or obstacles infront of them using PIR and Ultrasonic sensor.

**Purpose:** To serve and guide the visual impaired people by giving them information about the environment and alert them about the obstacles ahead of them. The device can navigate the blind people correctly and enable them to move around confidently, especially in public buildings. This device will be used to maximize the safety for blind people in indoor and outdoor environments.

**Features:**

* Ability to measure the distance of an approaching object
* Can detect movable objects and converts the data into audio signal
* Can detect movable objects and alert the user using vibration as well
* Overhead obstacle detection
* Can measure the object distance from the frequency of sound
* Can detect the type of an object
* Can detect wet floor
* Can detect un even road
* Can guide the route using Gyroscope
* Consists a flash LED light upon users requirement

**Application:** Home, public buildings, indoor and outdoor environments. Particularly useful around crowded places.

**Hardware/software requirement:** Ultrasonic sensor, proximity sensor, radio frequency identification system (RFID), built-in speaker, wireless charging to recharge batteries, GPS locator, Gyroscope.

**Title:** An embedded sensor that can detect the food items in a refrigerator and notifies the user through a mobile app.

**Purpose:** Notifying the user through a mobile app about what type of food items are stored for them in the refrigerator. And also notifies when a particular food item is about to finish, for example; vegetables, dairy products etc, and can also provide the recipes with those food items left in the refrigerator.