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PROJECT IDEA

TITLE- SMART OBJECT FINDER

We aim to design an IOT based product which helps to track misplaced objects. In this fast paced world, we provide a quicker alternative to locate an object.

This product is equipped with a user friendly API platform which tracks down the precise location of the object through exact coordinates .This design is used to find objects and alert the owner regarding its whereabouts.

It is equipped with a buzzer and a led – short range tracking

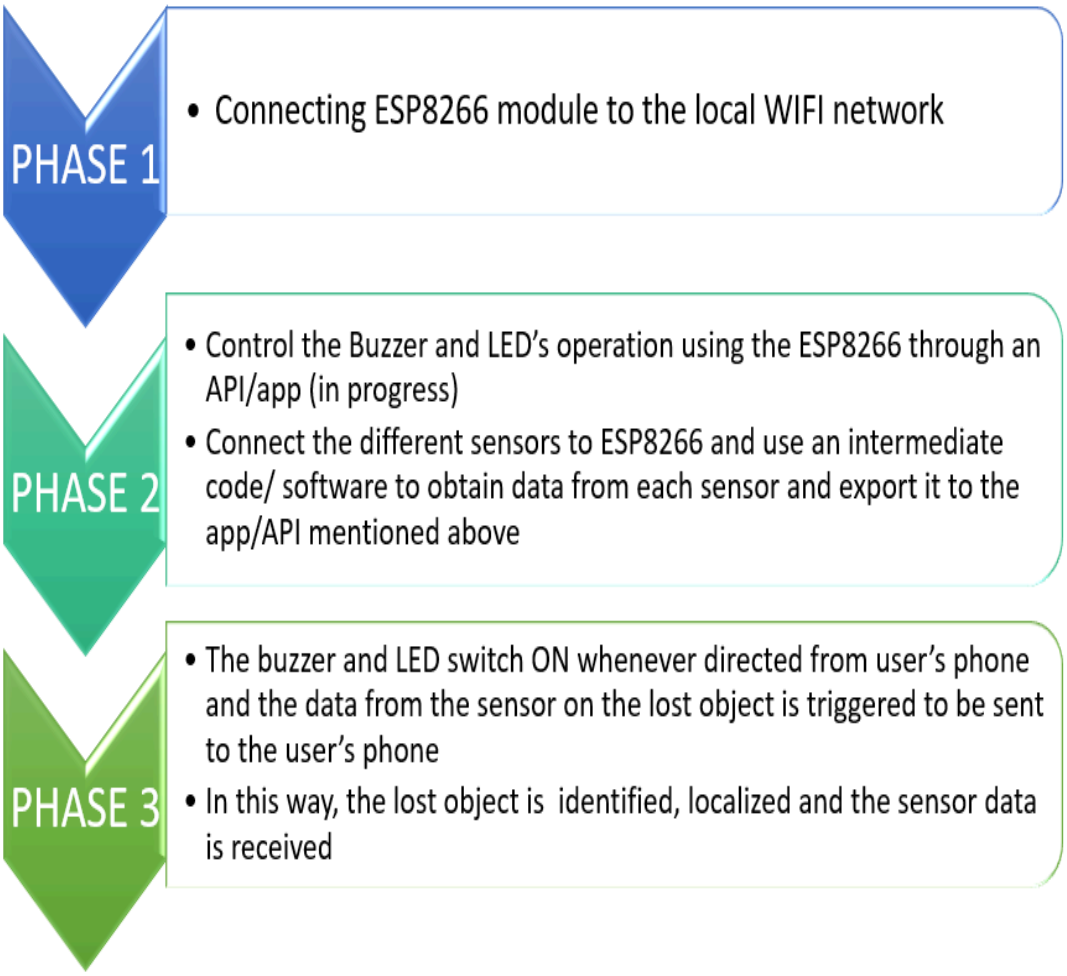
It has a smoke sensor that detects the presence of smoke and other gases when triggered.

A Flame sensor is also connected that alerts the user when it encounters any fire or burning flame.

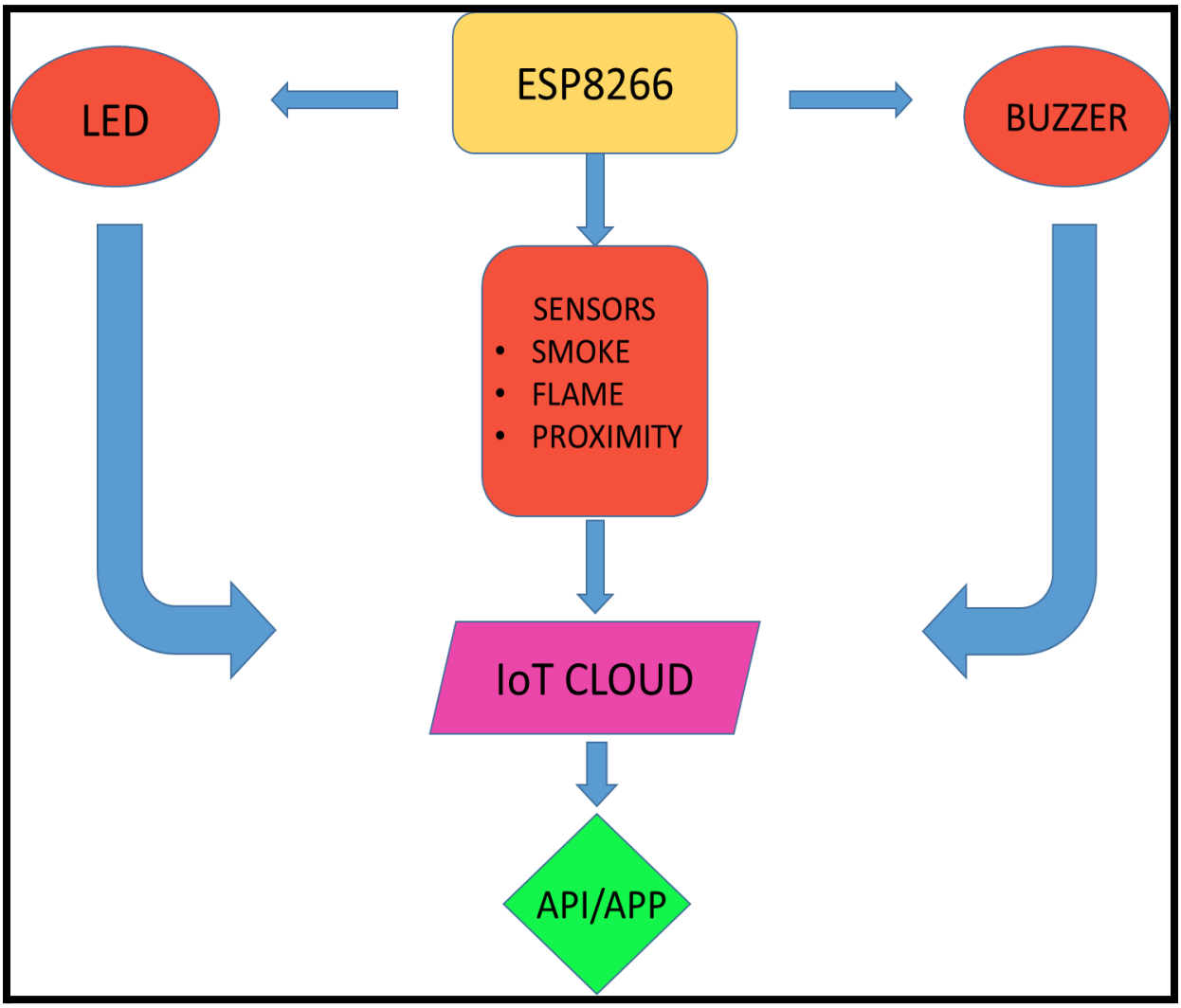
The Proximity sensor equipped in our project helps the user to protect their valuables from theft or tampering.

As it uses a cloud based system it provides all time access to the user

WORK FLOW


PHASE 1
• Connecting ESP8266 module to the local WIFI network
PHASE 2
• Control the Buzzer and LED's operation using the ESP8266 through an API/app (in progress)
• Connect the different sensors to ESP8266 and use an intermediate code/ software to obtain data from each sensor and export it to the app/API mentioned above
PHASE 3
• The buzzer and LED switch ON whenever directed from user's phone and the data from the sensor on the lost object is triggered to be sent to the user's phone
• In this way, the lost object is identified, localized and the sensor data is received

BLOCK DIAGRAM



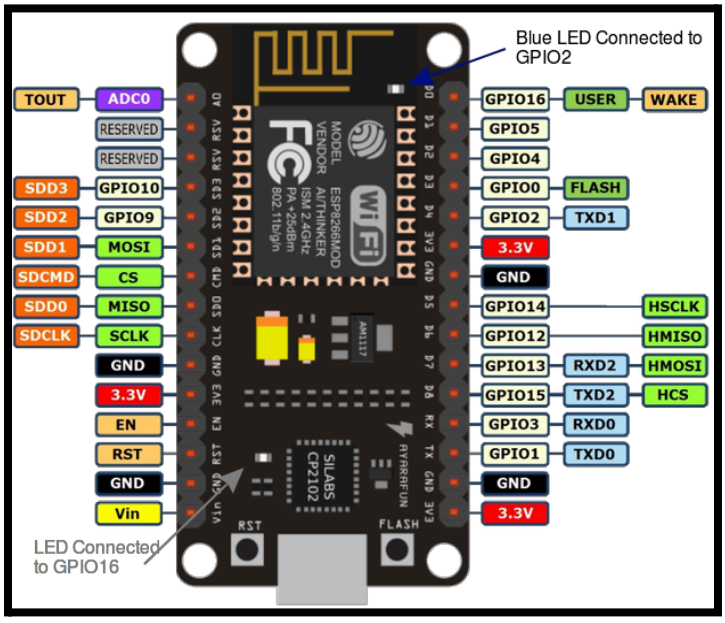
METHODOLOGY

- We have used ESP8266-12e Wi-Fi Module which provides all time access and a cost effective solution.
- To detect smoke and other gases that can have harmful effects, we have used a smoke sensor.
- A Flame sensor is also connected that alerts the user when it encounters any fire or burning flame.
- The Proximity sensor equipped in our project helps the user to protect their valuables from theft or tampering. It sends an alert message through the API when the set safety distance is breached.
- For short range tracking we use the buzzer and LED
- For long-range tracking we can use Neo 6M GPS module to know the location by coordinates through an API/app. Preliminary latitude and longitude data was obtained using the Neo 6M.

More accurate positioning and localization can be achieved using more sophisticated Geolocation API's and NMEA Decoders.

BACKBONE OF THE PROJECT

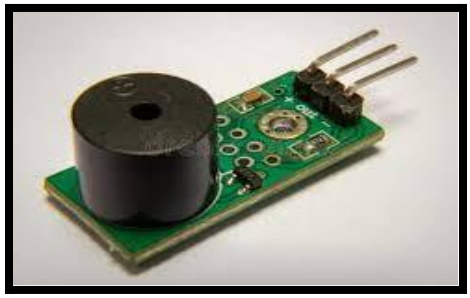
ESP8266 WIFI MODULE



An ESP8266 Wi-Fi module is a SOC microchip mainly used for the development of end-point IoT applications. It is referred to as a standalone wireless transceiver, available at a very low price. It is used to enable the internet connection to various applications of embedded systems.

The ESP8266 Wi-Fi module is highly integrated with RF balun, power modules, RF transmitter and receiver, analog transmitter and receiver, amplifiers, filters, digital baseband, power modules, external circuitry, and other necessary components.

BUZZER

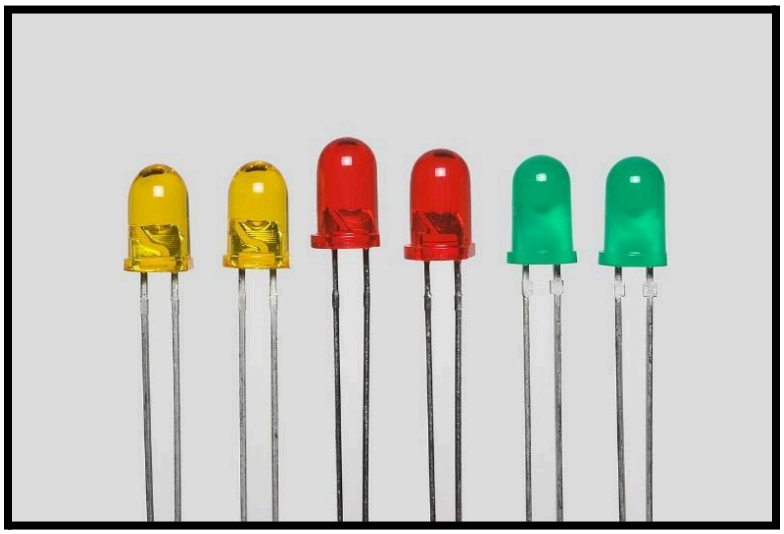


A piezo buzzer is a type of electronic device that's used to produce a tone, alarm or sound. It's lightweight with a simple construction, and it's typically a low-cost product.

Yet at the same time, depending on the piezo ceramic buzzer specifications, it's also reliable and can be constructed in a wide range of sizes that work across varying frequencies to produce different sound outputs.

We are using an active piezo buzzer for our project

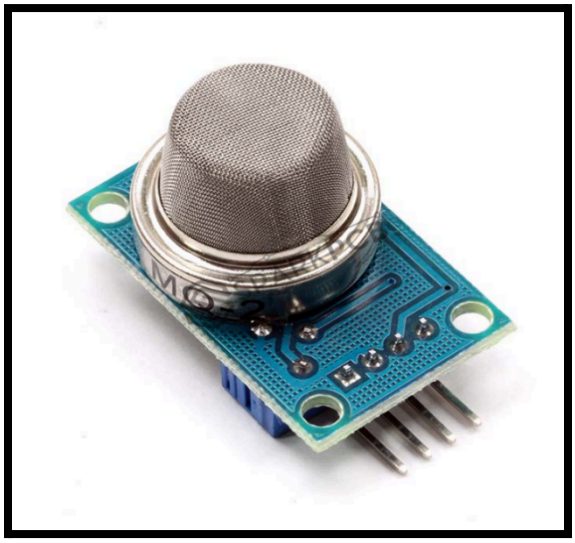
LED



LED stands for **light emitting diode**. LED lighting products produce light up to 90% more efficiently than incandescent light bulbs.

An electrical current passes through a microchip, which illuminates the tiny light sources we call LEDs and the result is visible light

SMOKE SENSOR

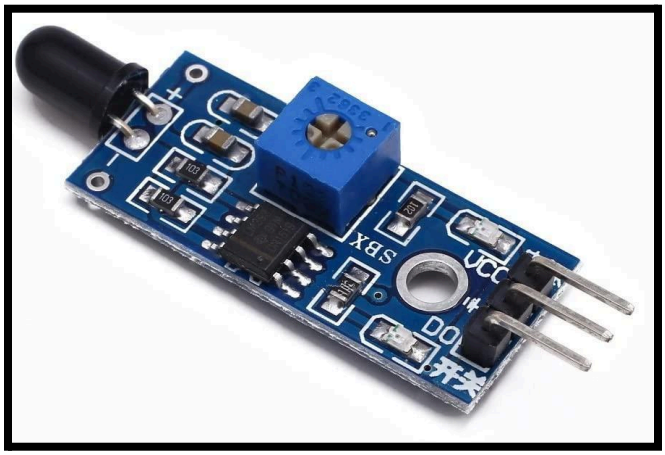


A smoke detector is a device that senses smoke, typically as an indicator of fire. Smoke detectors are usually housed in plastic enclosures, typically shaped like a disk about 150 millimeters (6 in) in diameter and 25 millimeters (1 in) thick, but shape and size vary.

Smoke can be detected either optically (photoelectric) or by physical process (ionization). Detectors may use one or both sensing methods. Sensitive alarms can be used to detect and deter smoking in banned areas. Smoke detectors in large commercial and industrial buildings are usually connected to a central fire alarm system.

The specific model we're using is MQ5 Gas sensor (analog) which is suitable of detecting LPG, H2, CH4, CO and Alcohol vapors. Sensitivity of the sensor can be changed using potentiometer.

FLAME SENSOR

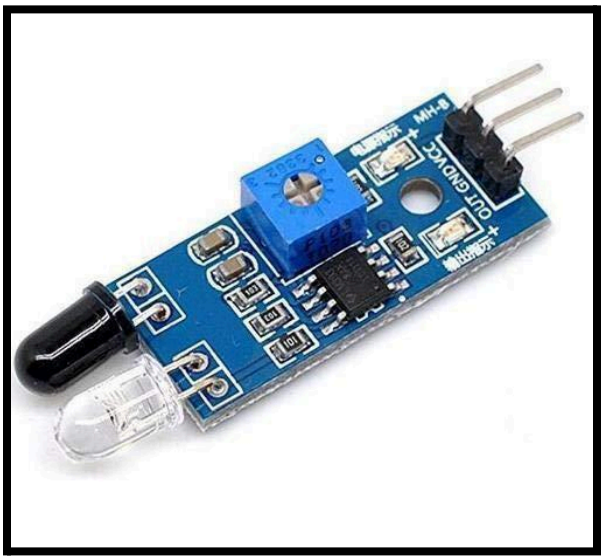


A flame-sensor is one kind of detector which is mainly designed for detecting as well as responding to the occurrence of a fire or flame. The flame detection response can depend on its fitting. It includes an alarm system, a natural gas line, propane & a fire suppression system. This sensor is used in industrial boilers.

The main function of this is to give authentication whether the boiler is properly working or not. The response of these sensors is faster as well as more accurate compare with a heat/smoke detector because of its mechanism while detecting the flame.

The Wave share flame sensor we’re using , has a spectrum range of 760-1100nm with a detection angle of 0-60 degrees and an operating temperature of 25-85 degree Celsius.

□ PROXIMITY SENSOR

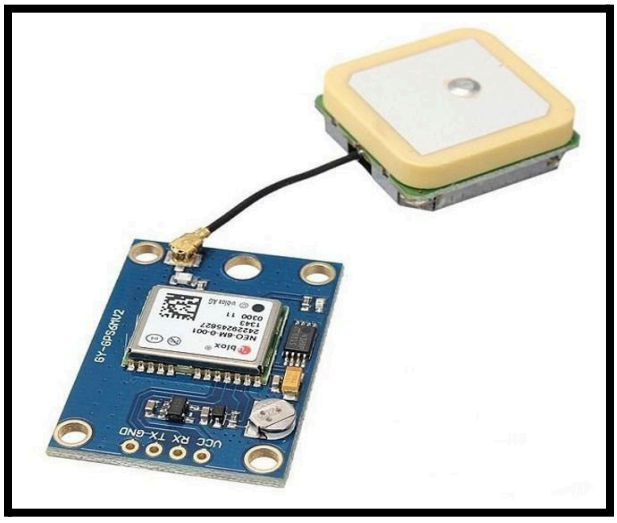


A proximity sensor is a non-contact sensor that detects the presence of an object (often referred to as the “target”) when the target enters the sensor’s field. Depending on the type of proximity sensor, sound, light, infrared radiation (IR), or electromagnetic fields may be utilized by the sensor to detect a target.

Proximity sensors are used in phones, recycling plants, self-driving cars, anti-aircraft systems, and assembly lines. There are many types of proximity sensors, and they each sense targets in distinct ways. The two most commonly used proximity sensors are the inductive proximity sensor and the capacitive proximity sensor.

The IR sensor we’re using consists of LM358 IC and can perform obstacle detection from 2 to 20cm and a detection angle of 35 degrees

NEO 6M GPS MODULE



This unit uses the latest technology to give the best possible positioning information and includes a larger built-in **25 x 25mm** active GPS antenna with a UART TTL socket.
A battery is also included so that you can obtain a GPS lock faster. This is an updated GPS module that can be used with ardupilot mega **v2**. This GPS module gives the best possible position information, allowing for better performance with your Ardupilot or other Multirotor control platform for applications in the field of drones

The GPS module has serial TTL output, it has four pins: **TX, RX, VCC, and GND**.

APPLICATION PROGRAMMING INTERFACE

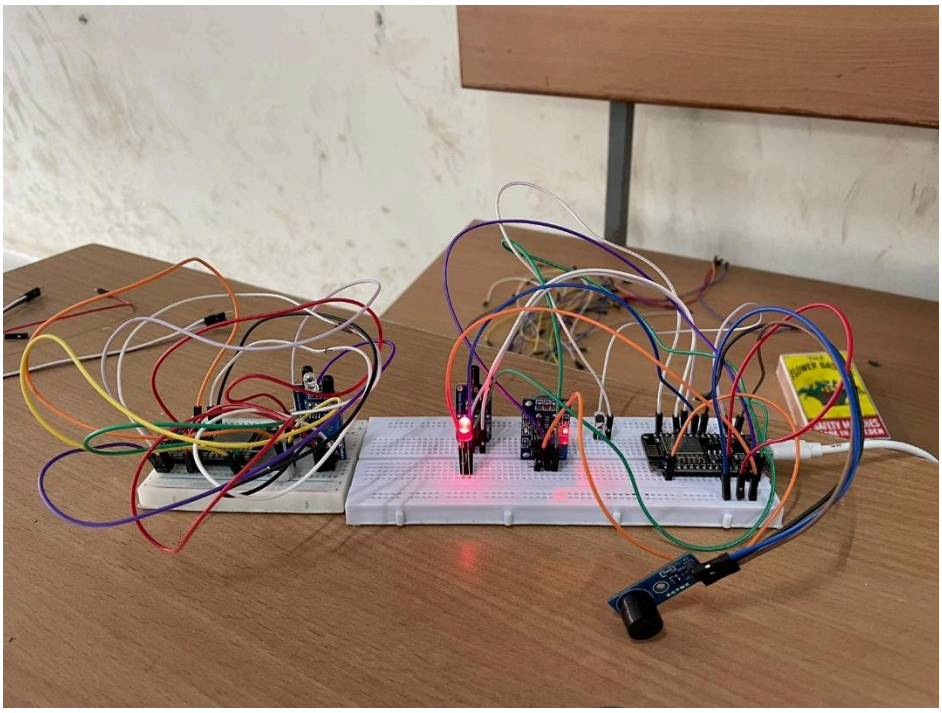
We have designed an app to view the position of the misplaced object. It also helps in operating the Buzzer and the LED.

We have programmed the app in such a way to control the LED and buzzer EXPLICITLY or SIMULTANEOUSLY.

It has an extremely simple layout –highly user friendly and appeals to all users.

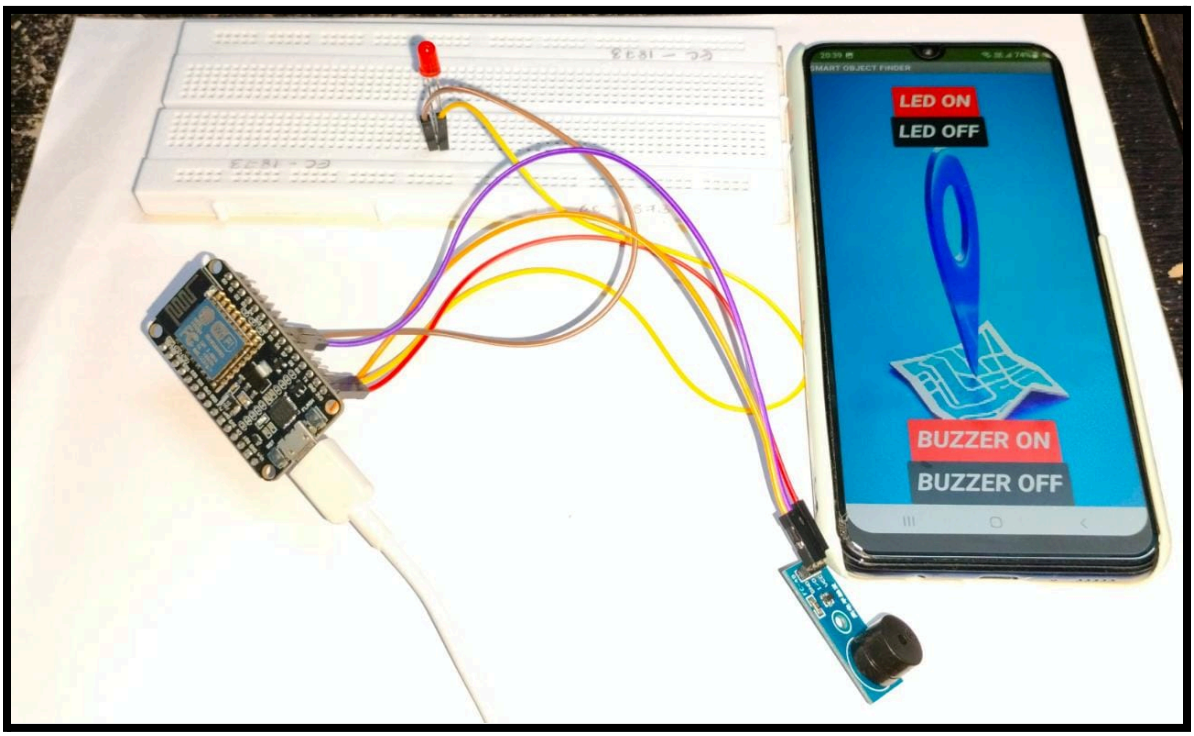
RESULTS

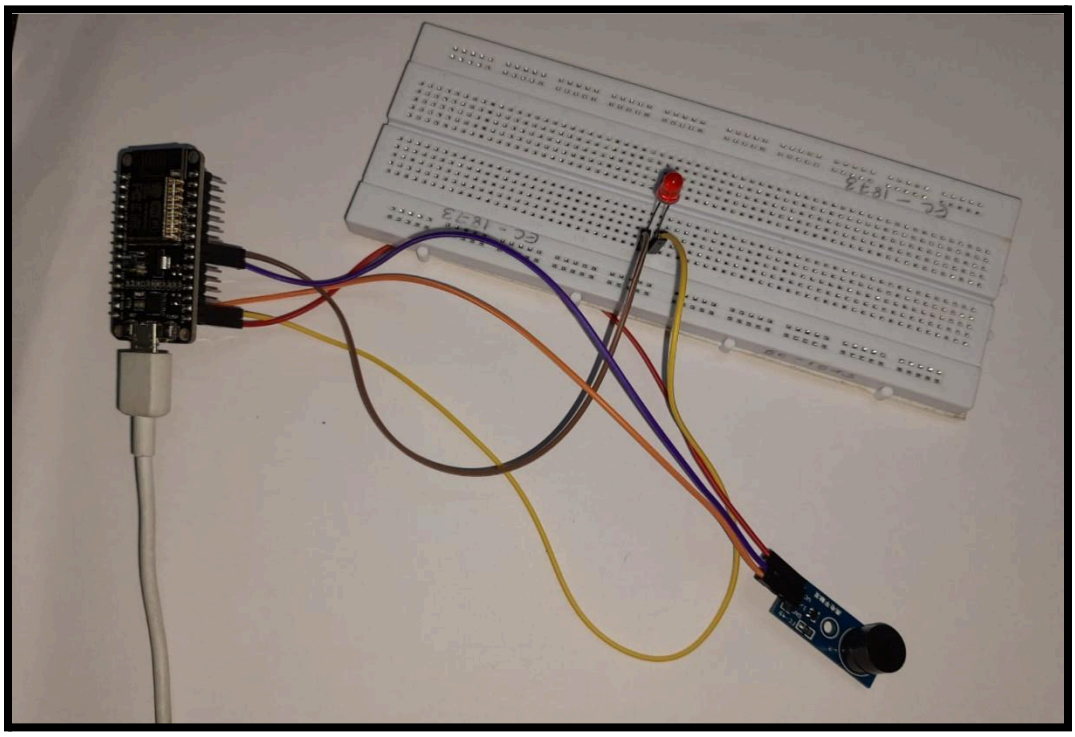
THE FINAL LOOK



OPERATING STEPS AND OUTPUT

Controlling the LED and Buzzer through API





DISCUSSION

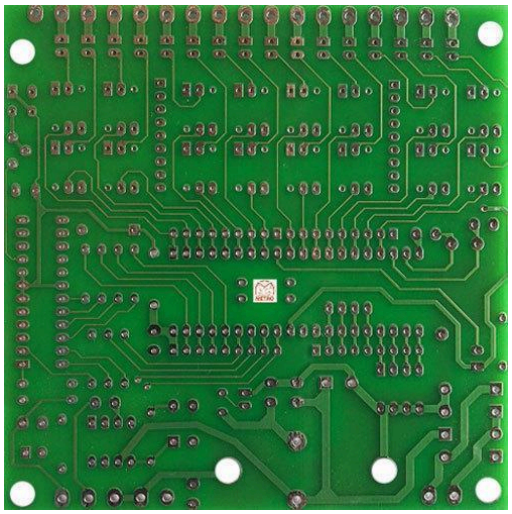
ADDED FEATURES

For supporting many applications and making it a versatile multifunctional product we can improvise in the following manner:

- ✔Use of ***GSM Module*** to allow access in remote areas where WIFI is unavailable. This can also be used to support communication through SMS.

- ✔Use of ***Speech Recognition***: Implements AI for short range object tracking in our immediate vicinity

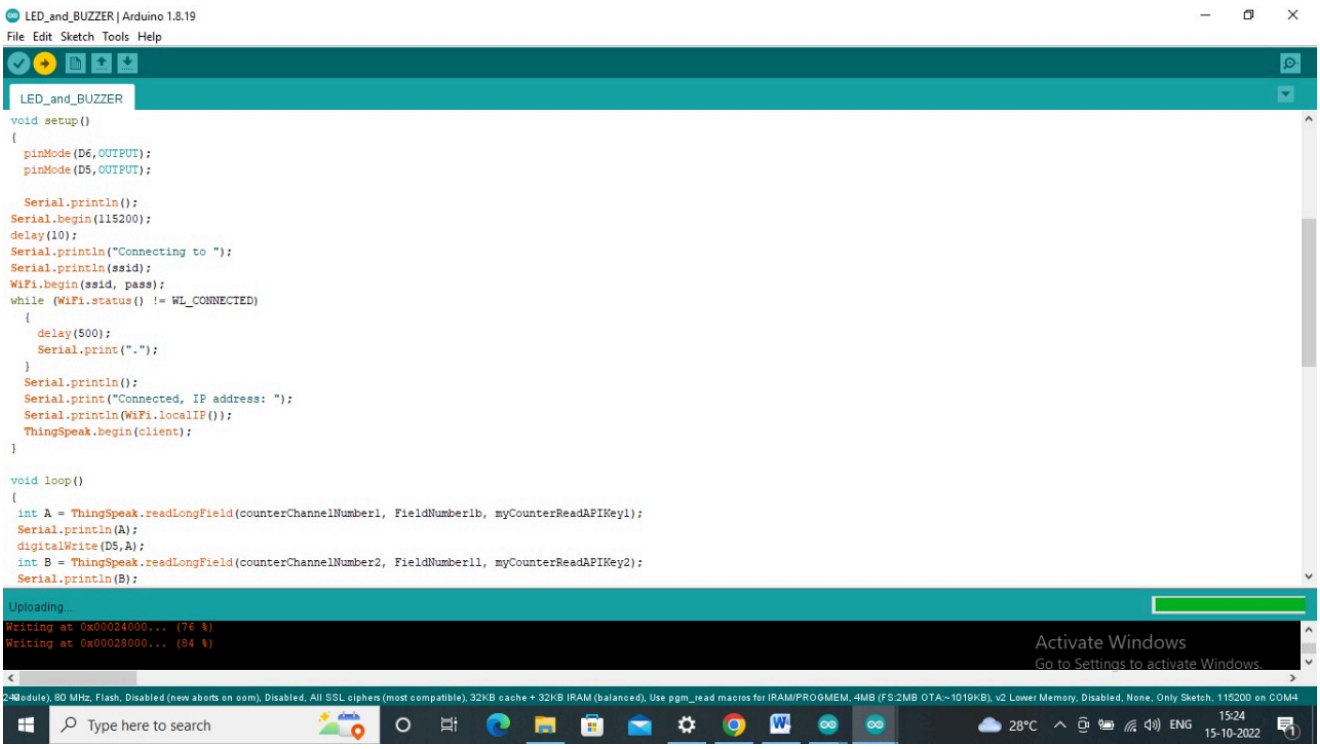
✔Making the circuit compact, portable and handy by converting it to ***PCB***.



✔Housing of the circuit and making it water proof for daily use

REFERENCES

WEBSITES	LINKS
• Google maps platform • YouTube • Electronic Wings • Thingspeak.com • Arduino.cc • Electronics Hub • Robu.in	❖ https://circuitdigest.com/microcontroller-projects/how-to-track-location-with-nodemcu-using-google-map-api ❖ https://community.element14.com/members-area/personalblogs/b/blog/posts/mit-app-inventor-and-arduino-part-2---send-data-from-arduino-to-android-and-display ❖ https://www.electronicwings.com/nodemcu/hc-05-bluetooth-module-interfacing-with-nodemcu ❖ https://www.youtube.com/watch?v=O3TEW6eQNBc

APPENDIX

SNIPPET OF CODE