

IOT SMART DOOR BELL

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PROJECT REPORT ON

IOT SMART DOOR BELL



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Submitted Date
29/10/2021

UNDERTAKING

I Declare that the work presented in this project titled “**IOT SMART DOOR BELL**”, submitted to the All India council of robotics and automation, for the award of the internship in ‘**INTERNET OF THINGS**’ is my original work. I have not plagiarized or submitted the same work for the award of any other internship. In case this undertaking is found incorrect, I accept that my project may be unconditionally withdrawn.

October, 2021

NAME: AMMARA FIRDOUS

NAME: PRATIKSHA LIMBARE

CERTIFICATE

I certified that the work contained in the project titled “IOT SMART DOOR BELL”, by AMMARA FIRDOUS & PRATIKSHA LIMBARE, has been carried out under any supervision and that this work has not been submitted elsewhere for a internship...

**All India Council of Robotics and
AutomationName of the Internship
Delhi-110020**

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- I take upon this opportunity to acknowledge the many people whose prayers and support meant a lot to me.i am deeply in debted to my mentor **sumit chatterjee research engineer,alaaudeen k m** who motivated me along the way
- I would like to thank all my teachers who help me in this project
- I further thank to my friends
- I owe my sincere gratitute towards the god
- My heart felt thanks to parents who supported me a lot
- Finally,i would like to wind up by paying my heartfelt thanks to aicra institute who provided me with this great opportunity

ABSTRACT

The objective of this project is to facilitate the user with a simple and customised technology to effectively manage visitors flowing to his/her premises. It is a real time smart doorbell notification system for home security. The system combines the functions of a smart and a house network system. It enables the users to monitor visitors in real time via the IOT based doorbell installed near the entrance door to a house. The doorbell can be controlled in a smart way to intimate the user with a picture and a text message of the visitor at the doorstep. When a visitor rings the doorbell, an SMS will be sent to the registered mobile number of the house member and the response in the form of an SMS will be displayed on an LCD screen placed beside the door so that the visitor can read the SMS and act accordingly. The visitor can also leave a voice message that will be sent to the house member. Fingerprint recognition can be added to provide additional security and to replace the traditional lock and key. The doorbell will be installed with an Arduino chip to transmit and receive messages. This system is also intended to serve old age people and to identify unauthorised intruders. In the age of technology, it is necessary to update our security systems and to make living easier.

TABLE OF CONTENTS

1. Introduction
2. Overview: Contactless smart DoorBell using ESP8266
3. Components required
4. About the Nodemcu ESP8266 Pinout
5. Nodemcu ESP8266 Specification & features
6. Nodemcu ESP8267 Pinout
7. Application of Nodemcu
8. IOT Doorbell Project Circuit Diagram: Contactless smart DoorBell using ESP8266 & Blynk
9. NodeMCU board with IR Sensor and Buzzer
10. IOT Doorbell cell phone Application designing in Blynk
11. IOT Doorbell Project Programming
12. Source code for smart Doorbell
13. Conclusion
14. References

INTRODUCTION

The Internet of Things (IOT) is an important topic in technology industry, policy, and engineering circles and has become headline news in both the specialty press and the popular media. This technology is embodied in a wide spectrum of networked products, systems, and sensors, which take advantage of advancements in computing power, electronics miniaturization, and network interconnections to offer new capabilities not previously possible. An abundance of conferences, reports, and news articles discuss and debate the prospective impact of the “IOT revolution”—from new market opportunities and business models to concerns about security, privacy, and technical interoperability. This project focuses on exploiting IOT to ensure a better security system in households. The present doorbell systems follow traditional approach, when a visitor presses the switch bell that rings inside the house. If someone is present in the house they open the door and if no one is present in the house the visitor waits for certain time and leaves the place without any clue. Over the past few years technology has taken over the society. Technology is vital today and makes everything easier. One such advancement in the field of doorbell is using “The Automatic doorbell system” (ADBS). Door bells have moved from historical switches to modern touch pads and now it is more sophisticated with the usage of sensors and IOT.

OVERVIEW: CONTACTLESS SMART DOORBELL USING ESP8266

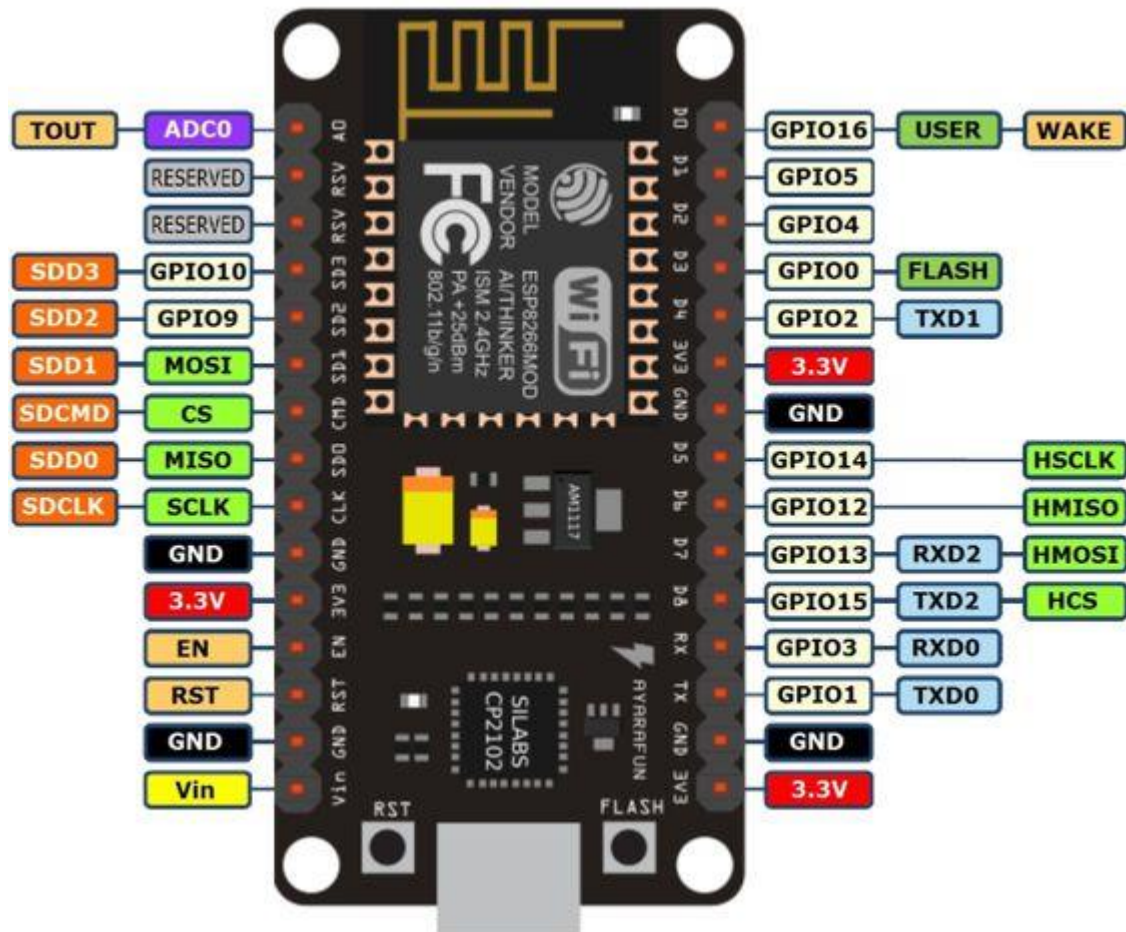
Doorbells are the foremost common germs infected objects in homes, hospitals, factories, and older homes. Our mission is to create a far better and healthier world, so we are building this project. This project will control and stop COVID-19 from spreading forward. Let's work together to stop spreading the virus.

This smart wireless Contactless iot doorbell is extremely user friendly based on wifi and IR sensors. You'll be able to make it yourself if you followed this tutorial. Before, getting started with circuit diagram and programming. I am going to describe how this project works. When you are few kilometers far away from your home, you can take out your smartphone, open the app and press the button on your Android or iphone, the buzzer set on the house notifies the household members. About your arrival and they open the door for you. In this way, you do not have to wait at the door for minutes. Further, the IR sensor is also interfaced with the Nodemcu ESP8266 module. The person near the door just shakes his/her hand in front of the IR sensor. At the same time, the buzzer is activated for a couple of seconds. Now the family members will get notice and open the door. Hence, there is no necessity of pressing any buttons. In this way, we can build a Contactless Smart doorbell using ESP8266 and Blynk iot Application.

COMPONENTS REQUIRED

- Node MCU ESP8266 Development Board
- IR Sensor Module
- Buzzer
- Blynk IoT Application

ABOUT THE NODEMCU ESP8266 PINOUT



The nodemcu esp8266 wifi module is an open-source lua based firmware and development board. It is specifically targeted for iot based applications. It includes firmware from the esp8266 wi-fi soc espressif system and hardware based on the esp-12 module. Most esp8266 nodemcu boards have an input voltage pin (vin), three power pins (3.3v), four ground pins (gnd), one analog pin (a0), and several digital pins (gpio xx).

NODEMCU ESP8266 SPECIFICATIONS & FEATURES

- Microcontroller: Tensilica 32-bit RISC CPU Xtensa LX106
- Operating Voltage: 3.3V
- Input Voltage: 7-12V
- Digital I/O Pins (DIO): 16
- Analog Input Pins (ADC): 1
- UARTs: 1
- SPIs: 1
- I2Cs: 1
- Flash Memory: 4 MB
- SRAM: 64 KB
- Clock Speed: 80 MHz
- USB-TTL based on CP2102 is included onboard, Enabling Plug n Play
- PCB Antenna
- Small Sized module to fit smartly inside your IoT projects

pin	code	Arduin o alias
A0	A0	A0
D0	GPIO 16	16
D1	GPIO 5	5
D2	GPIO 4	4
D3	GPIO 0	0
D4	GPIO 2	2
D5	GPIO 14	14
D6	GPIO 12	12
D7	GPIO 13	13
SD2	GPIO 9	9
D8	GPIO 15	15
SD3	GPIO 10	10
RX	GPIO 3	3
TX	GPIO 1	1

NODEMCU ESP8266 PINOUT

For practical purposes **ESP8266 NodeMCU** V2 and V3 boards present identical pinouts. While working on the NodeMCU based projects we are interested in the following pins.

- Power pins (3.3 V).
- Ground pins (GND).
- Analog pins (A0).
- Digital pins (D0 – D8, SD2, SD3, RX and TX – GPIO XX)

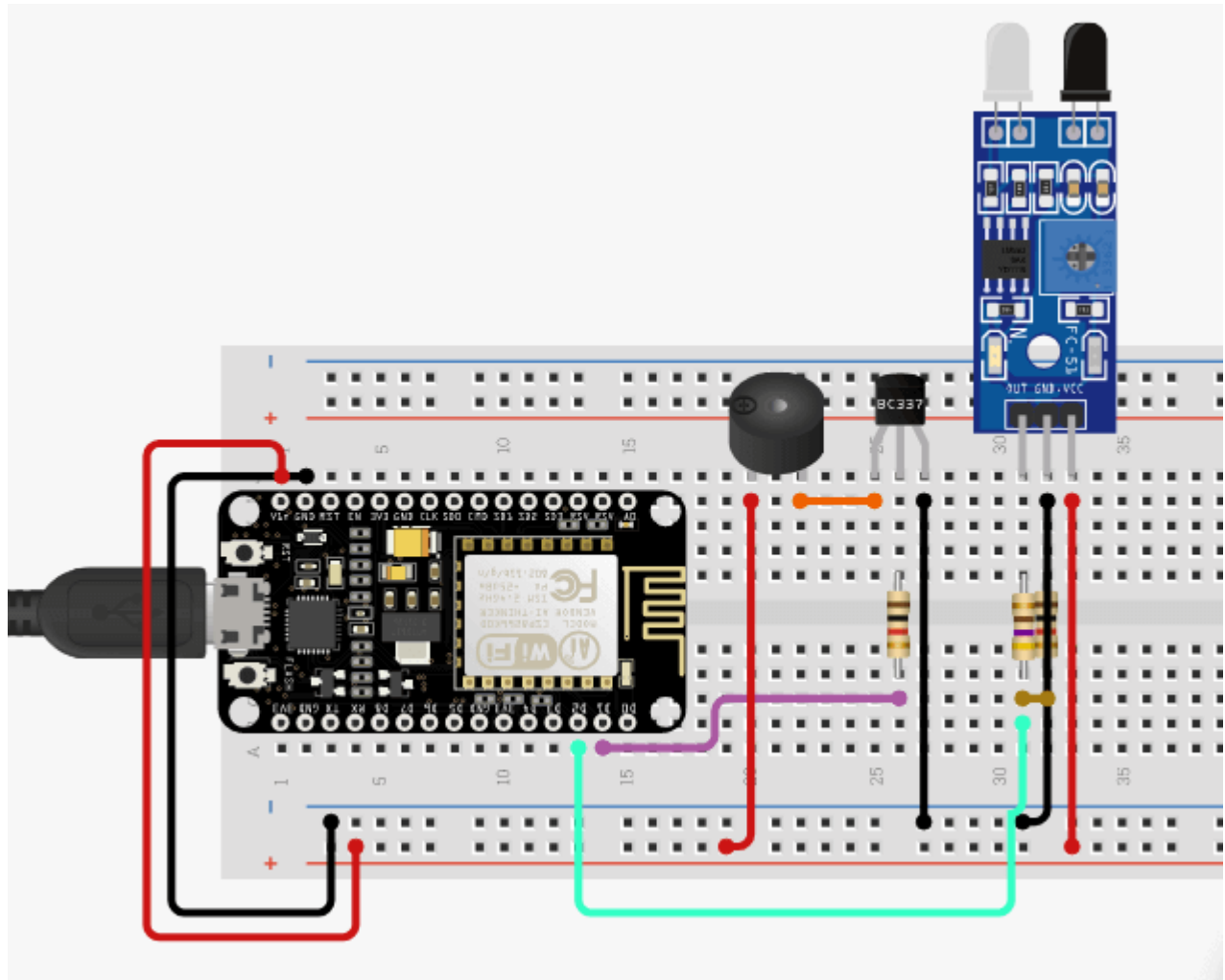
Most ESP8266 nodemcu boards have one input voltage pin (Vin), three power pins (3.3v), four ground pins (GND), one analog pin (A0) and several digital pins (GPIO XX).

APPLICATIONS OF NODEMCU

- Prototyping of IoT devices
- Low power battery operated applications
- Network projects
- Projects requiring multiple I/O interfaces with Wi-Fi and Bluetooth functionalities

Iot Doorbell Project Circuit Diagram :

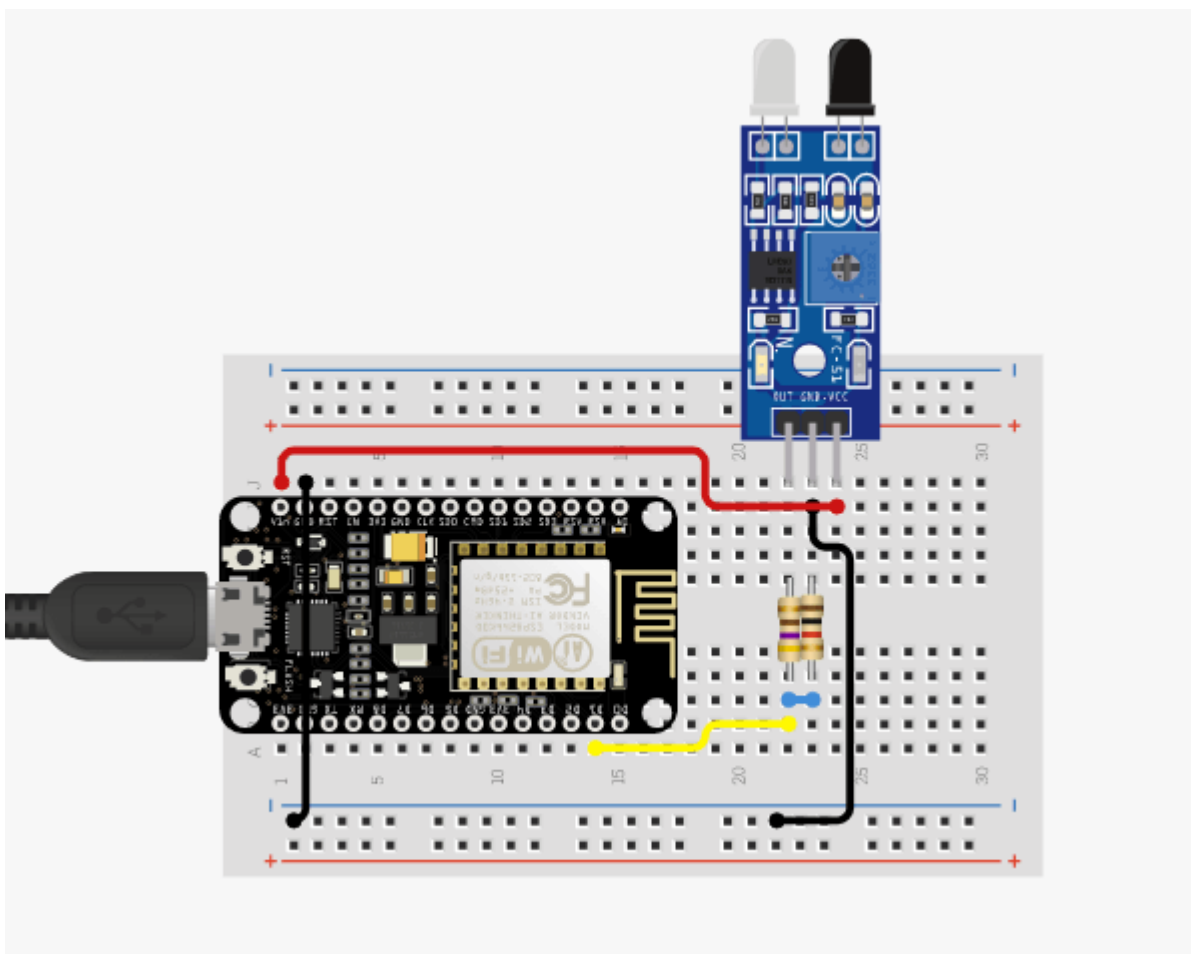
Interface all the components by looking at below circuit diagram and table for pin connection.



At first, we will interface ir sensor with nodemcu esp8266 wifi module for iot doorbell project.

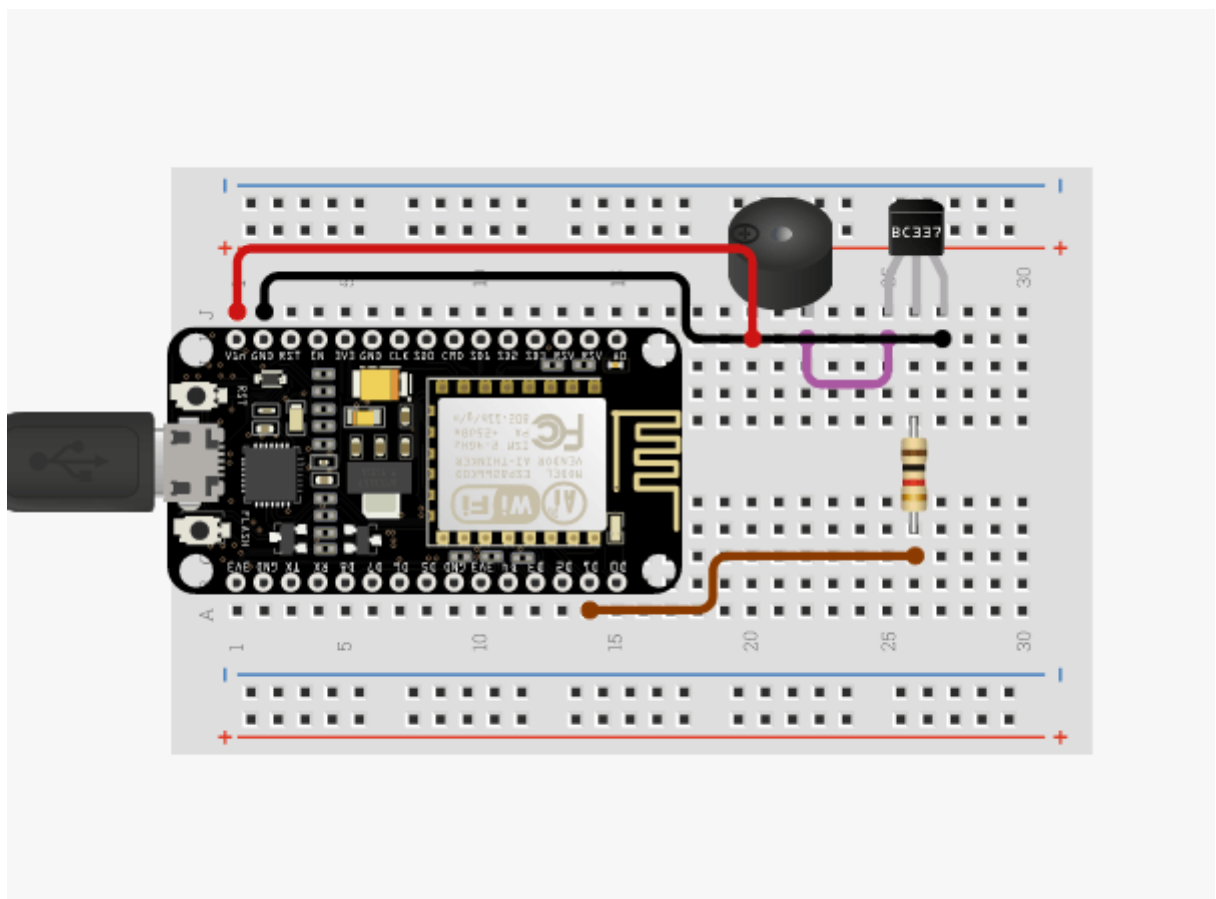
Nodemcu ESP8266	IR Sensor
GND	GND
Vin	Vcc
D2	Signal Pin through Resistor

Where, Resistance value=1k ohm



buzzer	Nodemcu ESP8266
-ve	TSBC337 C
+ve	Vin
TSBC337 E	GND
Res1KO con0	D1

Where, Resistance value=1k ohm



IOT DOORBELL CELL PHONE APPLICATION DESIGNING IN BLYNK

I have always been involved with the Blynk application and designed many apps before. In this session, I used some digital and virtual PIN for programming. Apart from this, my project has been tested to help you to check the code.

First of all, open the blynk application.

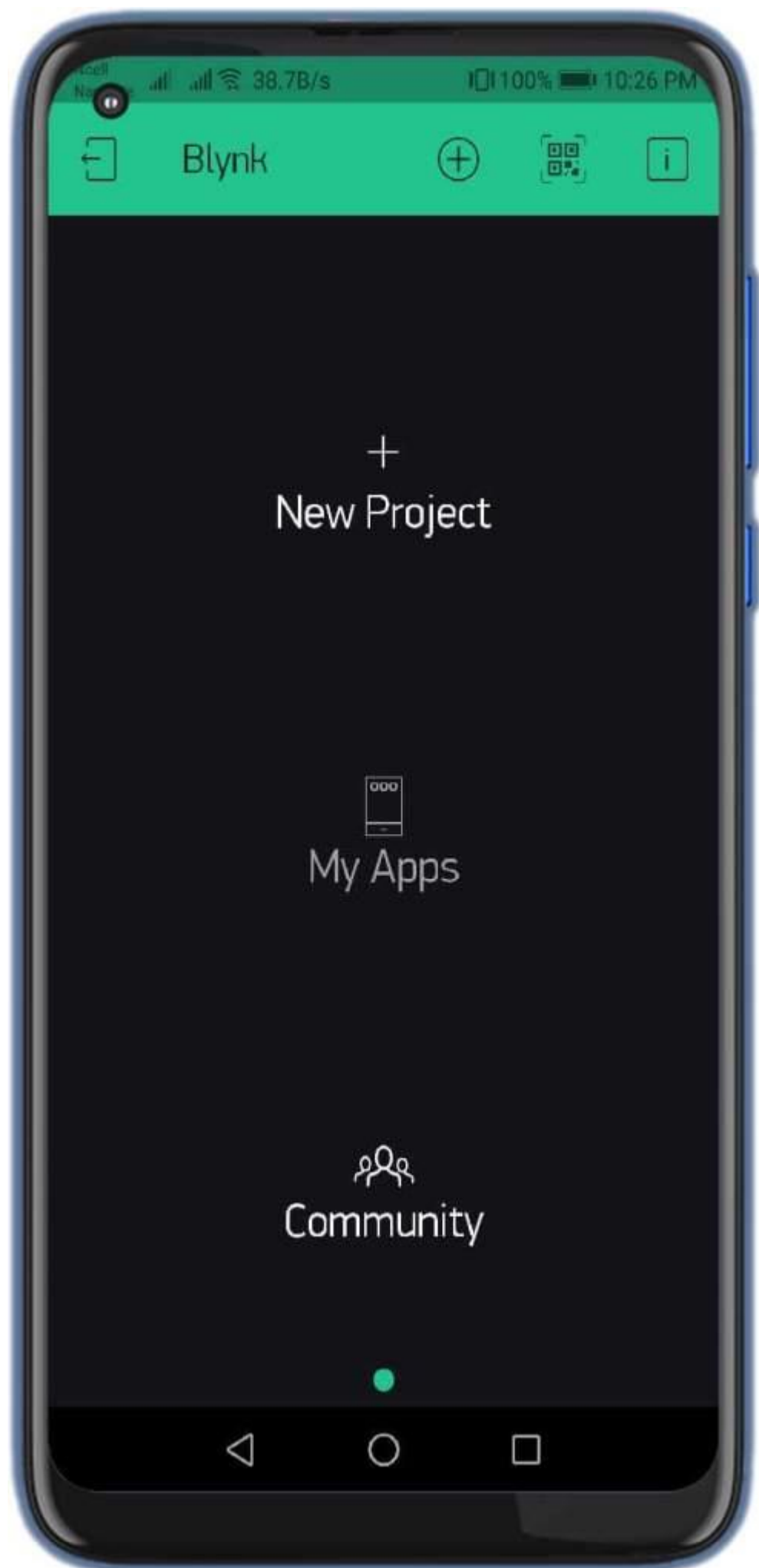
Click on the create a new project and enter the project name as “IoT Doorbell“. Instead, you can type any name. You can change the name later.

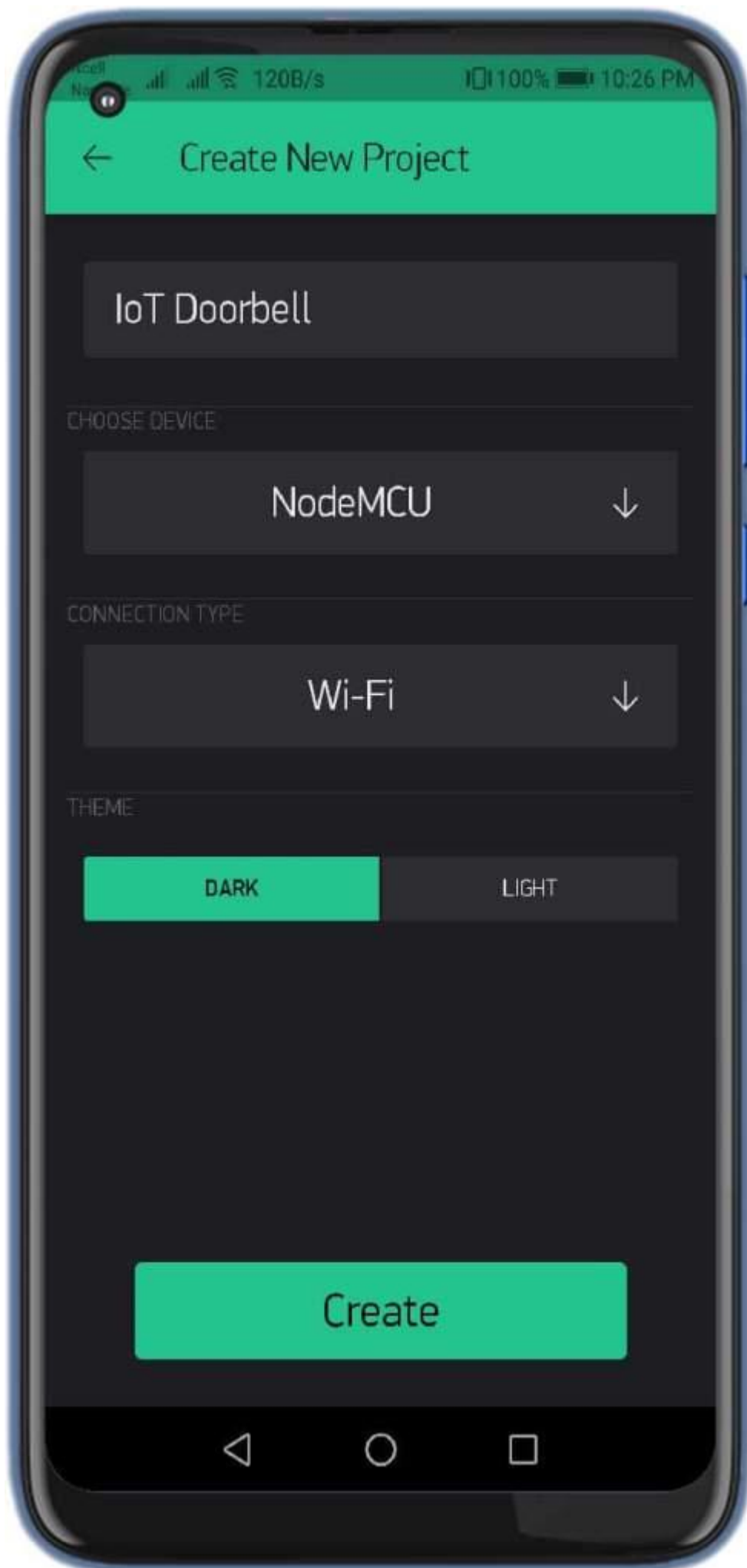
Click on Choice Tools and select NodeMCU ESP8266.

Make sure the connection type is set to WIFI.

Finally, click on the create button, a verification token will be sent to your email ID, which will be used in the Program CODE.

Click anywhere on the screen, search for the button, and select the button. Now, click on the button to change the name or leave as it is. Click Output and select GP0/D2. Select the button mode as the switch and finally, you can change the font size. Now Your designed IoT doorbell application is ready to use.





Create New Project

IoT Doorbell

CHOOSE DEVICE

NodeMCU



CONNECTION TYPE

Wi-Fi



THEME

DARK

LIGHT

Create



cell
Nar

11.1K/s


100% 10:27 PM



IoT Doorbell



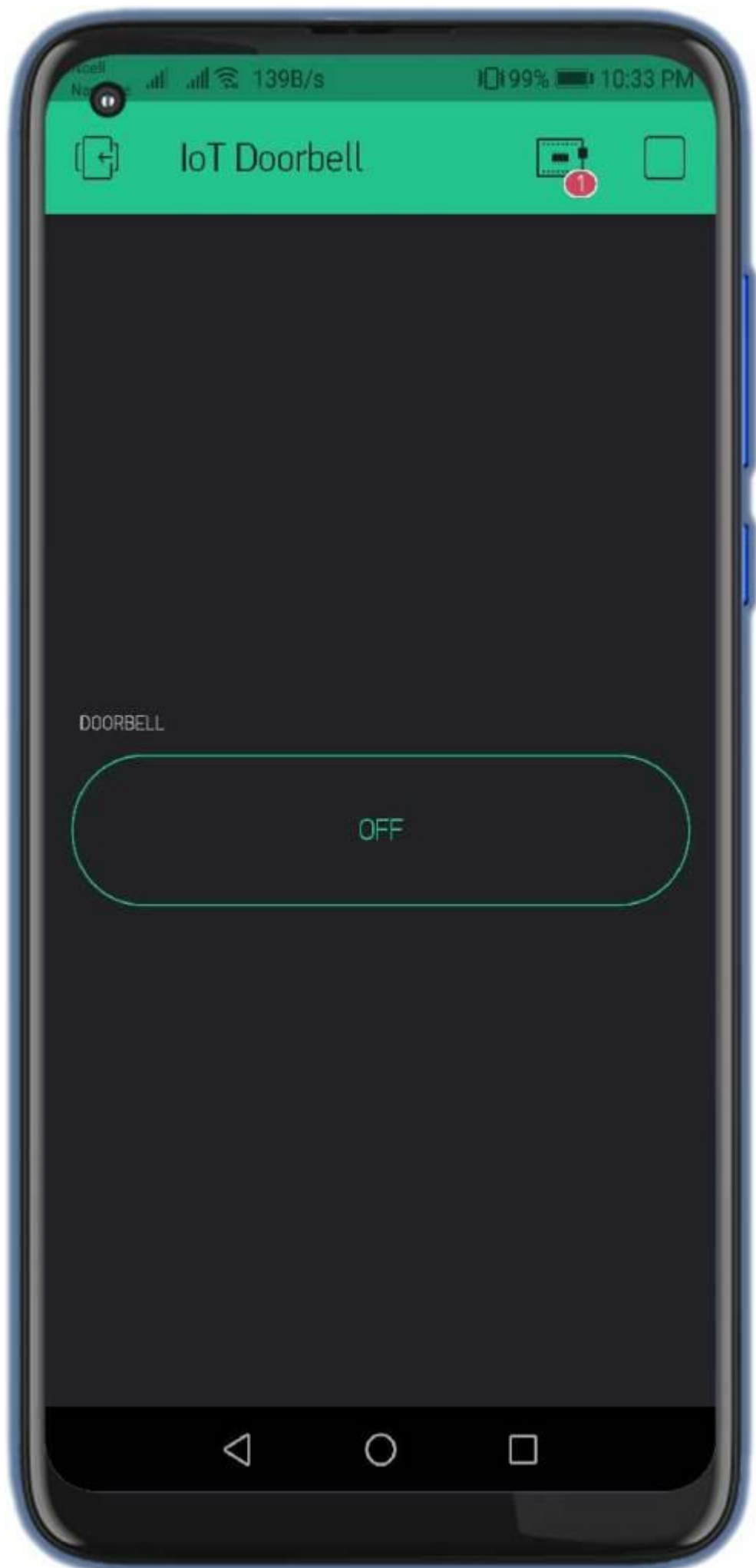
Auth Token was sent to:
ask.theiotprojects@gmail.com

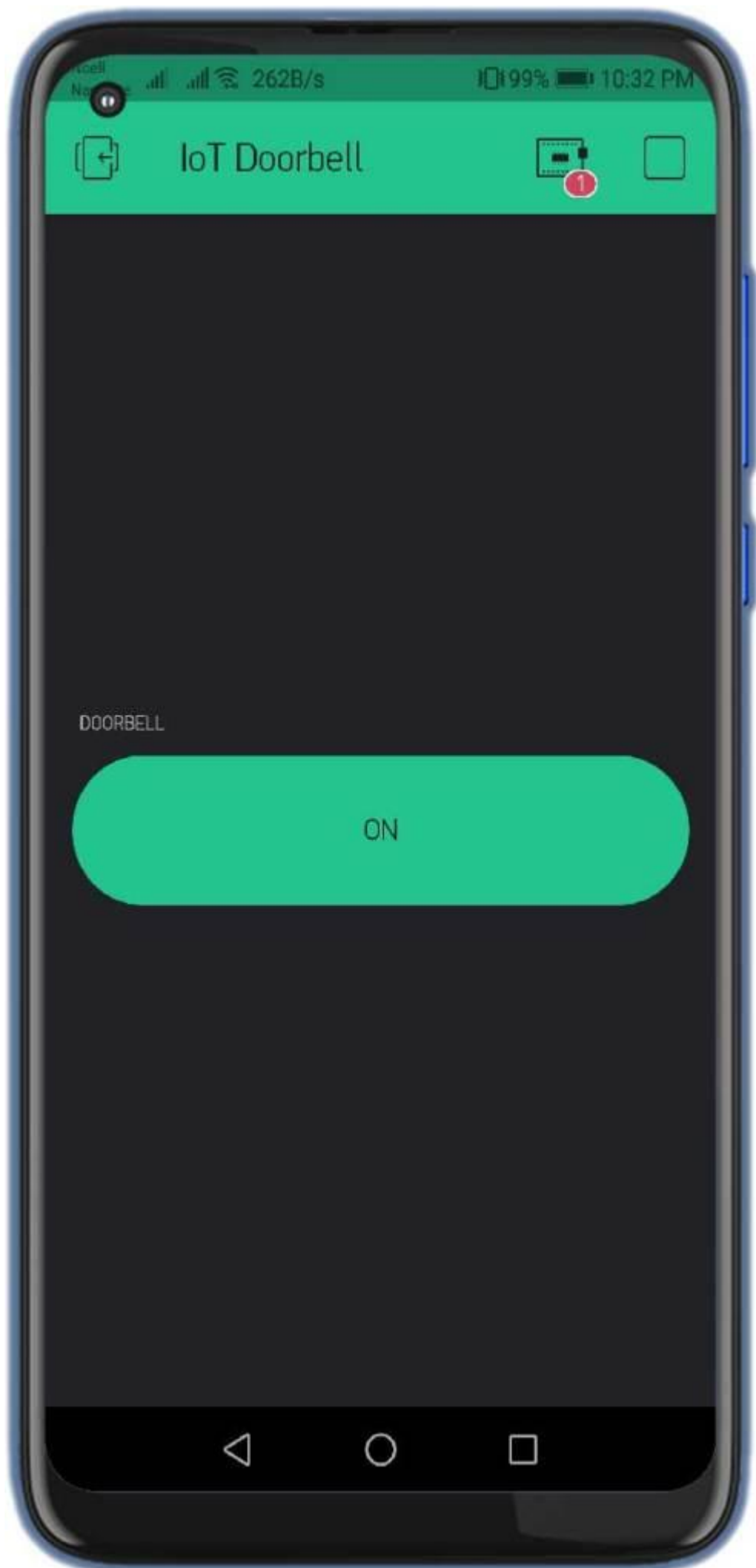
You can also find it in  Project Settings

OK



Don't show again





IOT DOORBELL PROJECT PROGRAMMING

First of all, I started adding the libraries required for contactless smart doorbell using ESP8266.

```
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>
#include <SimpleTimer.h>
#define BLYNK_PRINT Serial // Comment this out to disable prints and save space
```

This is the authentication token which was sent via email while building the Blynk IoT App. This authentication token will be mailed to your registered email ID.

```
char auth[] = "Ay7TN0ucWH-aFJKX-h7cV07_as2om0Hu";
```

These are your WiFi router credentials, the SSID and password. You can use mobile hotspot as well. In case you don't have router.

```
/* WiFi credentials */
char ssid[] = "xxxxxxx";
char pass[] = "xxxxxxx";
```

First of all the SimpleTimer variable is declared. Then the IR sensor and Buzzer Pins are defined. Inside the void setup() function, Serial Monitor and Blynk WiFi credentials are authenticated. PinMode Function for IR sensor and Buzzer is defined as INPUT and OUTPUT respectively.

```
SimpleTimer timer;
int IRsensor = D2; // IR Sensor Connected
int Buzzer = D1;

void setup()
{
  Serial.begin(115200);
  Blynk.begin(auth, ssid, pass);
  pinMode(IRsensor, INPUT_PULLUP);
  pinMode(D3, INPUT);
  pinMode(Buzzer, OUTPUT);

  timer.setInterval(1000L, Sensor);
  timer.setInterval(1000L, FromApp);
}
```

In the void loop() function, I am using only two functions which are timer.run() and Blynk.run() functions.

```
void loop()
{
  timer.run(); // Initiates SimpleTimer
  Blynk.run();
}
```

The void sensor () function is a user defined function, it has no return type and takes no argument as input. The purpose of this function is to check every second if there is anything in front of the IR sensor. If the IR sensor detects anything, it will open the buzzer for 2 seconds.

You're probably wondering why I'm using Blynk. begin (auth, ssid, Pass); Avoid this again as I said earlier otherwise the NodeMCU module will be disconnected. I'm using a 2-second delay, so if NodeMCU module connectivity is disconnected with the Blynk application, it helps to reconnect again.

```
void Sensor()
{
  while( digitalRead(IRsensor) == LOW)
  {
    digitalWrite(Buzzer, HIGH);
    delay(2000); // Buzzer remains ON for 2 seconds.
    Blynk.begin(auth, ssid, pass); // this again connects the Blynk application.
  }
}
```

The void FromApp () function is a user-defined function since it has no return type and does not take arguments as input. The purpose of this function is to check every second if a button is pressed on the Blynk application.

```
void FromApp()
{
  if(digitalRead(D3) == HIGH) // D3 is gp0 on the blynk app
  {
    digitalWrite(Buzzer, HIGH);
  }
  if(digitalRead(D3) == LOW)
  {
    digitalWrite(Buzzer, LOW);
  }
}
```

SOURCE CODE FOR SMART DOORBELL

```
// IoT based Contactless Doorbell Project by
//https://theiotprojects.com/

/* Nodemcu ESP8266 & Blynk */
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>
#include <SimpleTimer.h>

#define BLYNK_PRINT Serial // Comment this out to disable prints and save space

char auth[] = "Ay7TN0ucWH-aFJKX-h7cV07_as2om0Hu";
/* WiFi credentials */
char ssid[] = "xxxxxxx";
char pass[] = "xxxxxxxx";

SimpleTimer timer;
int IRsensor = D2; // IR Sensor Connected
int Buzzer = D1;

void setup()
{
  Serial.begin(115200);
  Blynk.begin(auth, ssid, pass);
  pinMode(IRsensor, INPUT_PULLUP);
  pinMode(D3, INPUT);
  pinMode(Buzzer, OUTPUT);

  timer.setInterval(1000L, Sensor);
  timer.setInterval(1000L, FromApp);
}

void loop()
{
  timer.run(); // Initiates SimpleTimer
  Blynk.run();
}

void Sensor()
{

```

CONCLUSION

The project named "Smart IOT Doorbell Surveillance" has been designed with the domain as Internet of Things. The basic concepts and working of IOT has been displayed in the running of the project. The project uses mainly an Arduino Board and OOPS programming concept. Since, today, in a technologically enhancing environment, security issues is of utmost concern, this project shows how technology can be used to enhance the security features of people's homes. A doorbell is constructed which has the feature to send a notification to the owner when somebody is at the door, with an attached picture of the person. It uses materials such as an Arduino Board, an Ethernet Shield (to send notifications across services), a doorbell, resistors and a web camera. This project enables users to stay connected to their homes and ensure even when the are travelling

REFERENCES

- [1] General safety features by Transport Canada, 2007.
- [2] Yang, X., Liu, L., Zhao, F., & Vaidya, N (2004), Vehicle-to-Vehicle Communication Protocol for Cooperative Collision Warning.
- [3] Kurt Dresner & Peter Stone (2008), Replacing the Stop Sign: Unmanaged Intersection Control, pp.94-101, Estoril, Portugal.
- [4] ARIB STD-T75, 2001 Zing Zhu, Sumit Roy. Dedicated Short Range Communication System.
- [5] Sang-woo Chang, Jin-soo Jung, Jin Cha, Sang-sun Lee, Implementation of DSRC Mobile MAC for VANET.
- [6] S. S. Dorle, Pratima Patel, Implementation of Adaptive Traffic Light Control System Based on Radio Propagation Model in Vanet.
- [7] Usha Devi Gandhi, Arun Singh, Arnab Mukherjee and Atul Chandak, Smart Vehicle Connectivity for Safety

