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# Smart Electronic Samayi

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**Abstract:** *An electronic lamp, also known as an LED lamp, is a type of lighting device that utilizes light-emitting diodes (LEDs) to produce illumination. Unlike traditional incandescent lamps, electronic lamps do not rely on a heated filament to generate light, but rather on the movement of electrons through a semiconductor material. This makes them much more energy-efficient and longer-lasting than traditional lamps, with the added benefits of lower heat output and reduced environmental impact. Electronic lamps are commonly used in a variety of applications, including residential and commercial lighting, automotive lighting, and electronic displays. In multiple inauguration ceremonies, there is always one ritual where the guest lights up (samayi) the lamp. For such purpose, an electronic design for a Samayi which can solve the problem of smoke and fire, is designed. Aim behind making this project is to make use of electronics in our day to day life and to reduce incidents that might take place using the traditional ones, incidents such as fire break outs, release of hazardous gas or smoke and also make human efforts less at some point. Experimentation of the same is presented in this paper.*

**Keywords:** Samayi, IoT, Andriod App (RemoteXY), Arduino

## I. INTRODUCTION

### 1.1Objective

The traditional Samayi – considered as an important aspect of several auspicious ceremonies and rituals; be it inauguration ceremonies, where honored guests lights up the Samayi or performing several rituals during festivals and in temples. The conventional Samayi uses cotton wicks along with ghee/oil to light up the auspicious flame which does not cost much. But there is always a chance of an accident taking place due to fire hazards which may subsequently lead loss of life and valuable property. Apart from it, people suffering from health problems like asthma, breathing problems may also suffer due to the smoke caused. Therefore this project is built using simple electronics . Samayi is a basic Arduino circuit including 5 LEDs, which will light up after a matchstick is near our sensors having 5 sec of interval in between. The sensors used are ultrasonic sensors and LDR which will detect the matchstick. Matchstick is a basic clap circuit. It consists of 555 timer IC, MIC, and LED which will turn on after it detects a sound near a matchstick. When the matchstick is ON, it is placed near the lamp. This is the electronics part. But here in this Samayi ON/OFF is controlled using a mobile app which will make it a smart IOT device. This is a basic working idea the project

## II. LITERATURE SURVEY

| Sr. No. | Title of the Paper | Year | Abstract | Remark |
|---|---|---|---|---|
| 1. | An IoT Based Smart Lighting System Based on Human Activity [1] | 2020 | A poor lighting system can lead to health issues like headache, eye sight issue etc. Therefore a proper lighting setup is essential in day to day use. | The paper provides a study on how poor system leads to several health problems and how they can be avoided using IOT based implementation. |
| 2. | Preventive measures for fire- related injuries and their risk factors in residential buildings. | 2019 | The aim is to identify risks and prevent from fire accidents in residential areas. | The journal gives an in-depth study of the fire hazards which occur commonly and how they can be prevented. |

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| | | | | |
|---|---|---|---|---|
| | [2] | | | |
| 3. | A Multi-Output Hybrid Divided Power Converter for LED Lighting Applications [3] | 2018 | This paper gives a introduction of a novel single inductor multi- output LED driver. The converter is able to reduce the area of components while maintaining high power processing efficiency. | The paper gives the description of the working of multiple outputs together with high power efficiency. |
| 4 | Internet of Things Based Intelligent Street Lighting System for Smart City [4] | 2016 | The project gives an insight on how conventional methods can lead to power wastage and how it can be resolved using IOT based implementation. | The proposed system describes the architecture and working principle of the prototype. |

Similarly the other articles and web links as mentioned in the references [5] - [26] has helped and motivated to work in this project idea. It has helped to gain knowledge from such vast literature and also helped to improve some technical skills related to IoT and electronic project. The articles with application development has guided in technical terms and hence the similar approach is presented here.

## III. BLOCK DIAGRAM

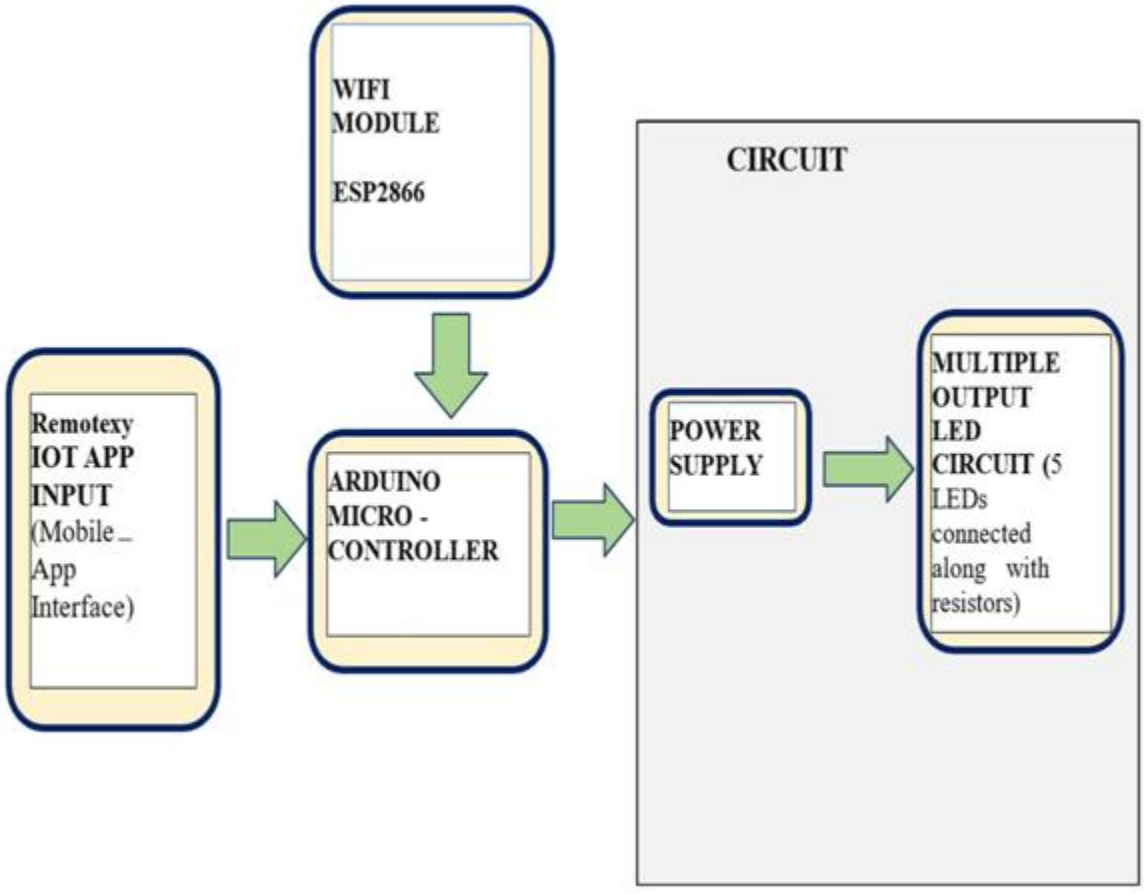


Fig. 1 – Block Diagram Representation

The input is given from RemoteXY IOT App (Mobile – App Interfacing) to the microcontroller as seen in Fig.1 and the LEDs can be controlled accordingly.

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## IV. CIRCUIT DIAGRAM

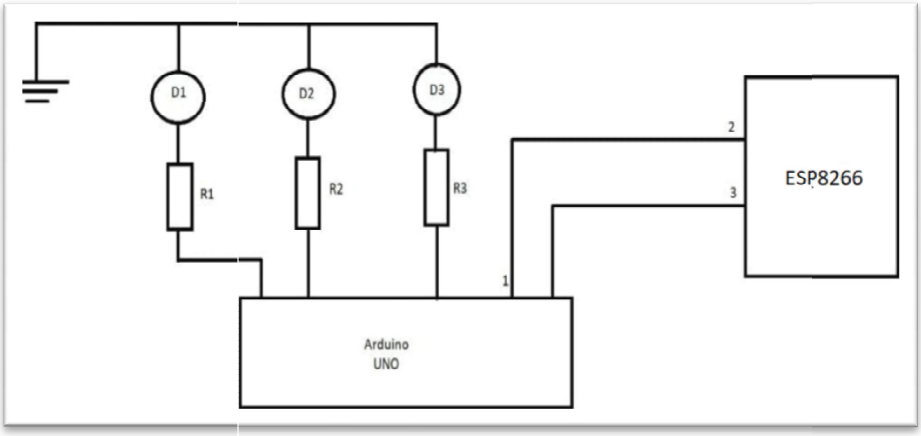
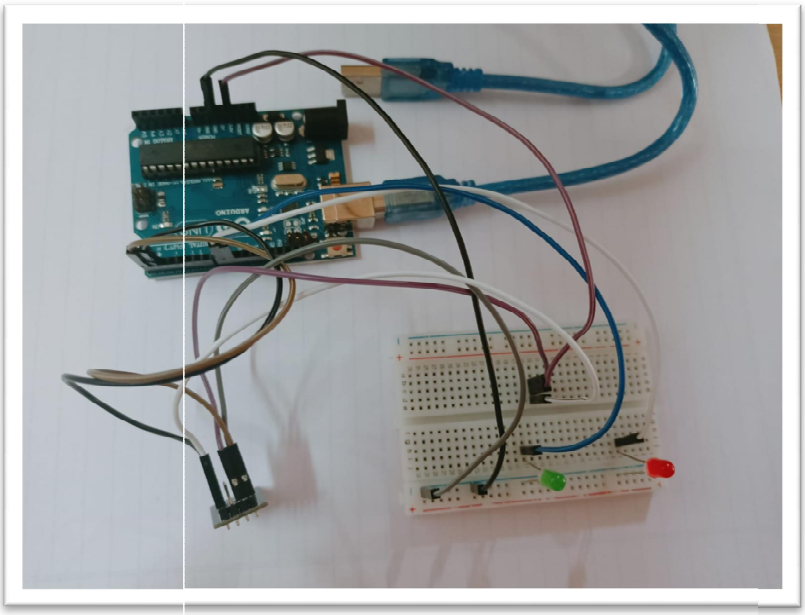



Fig. 2 – Circuit Diagram of the Module Interfacing

The fig 2 shows how the LEDs will be configured to the Arduino UNO Board along with our ESP8266 Wi-Fi Module. The LEDs will be connected to the resistors in order to make sure that the LEDs get appropriate amount of voltage and don't get damaged.

**Basic Set Up**



## V. System Specifications

Selection of Components

| Components | Description |
|---|---|
| Arduino Microcontroller | It is a microcontroller which has a integrated software IDE for writing code and it is a 40 pin IC. Arduino UNO board is used in this project. |
| LEDs | Light Emitting Diode (LED) is a electrical component which emits light and used for illumination and indication. |
| Resistors | A resistor is a electrical component that is used to control the flow of current in a circuit to prevent the circuit from getting damaged. |

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| | |
|---|---|
| Battery | Battery is used to store the energy and supply power. |
| ESP8266 | It is a Wi-fi Module. |

**RemoteXY Interface**

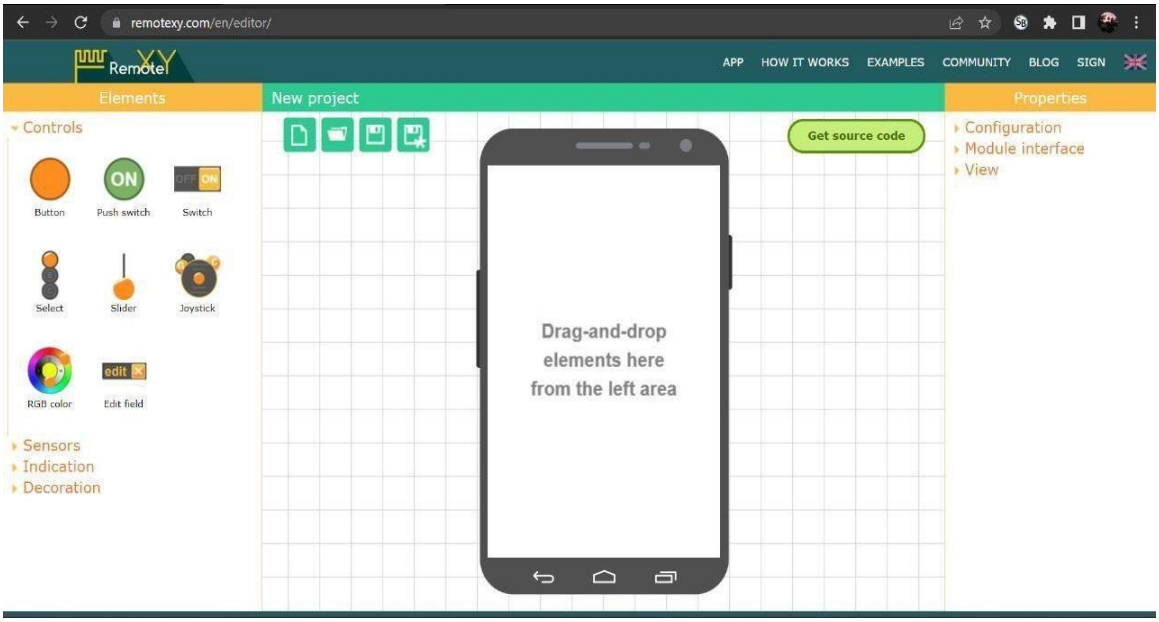


Fig.4 - Interface of RemoteXY Web App

The fig 4 shows the interface of RemoteXY in web browser. All the available controls and buttons canbe seen in the image. In the left pane all the available control types can be seen by which input can be provided. Whereas in the right pane options are visible to configure the module

RemoteXY is easy way to make and use a mobile graphical user interface for controller boards to control via smartphone or tablet. The GUI is designed to be displayed on Mobile App via the Web Browser and in this case the connection is established via Wi-fi as shown in figure 5.

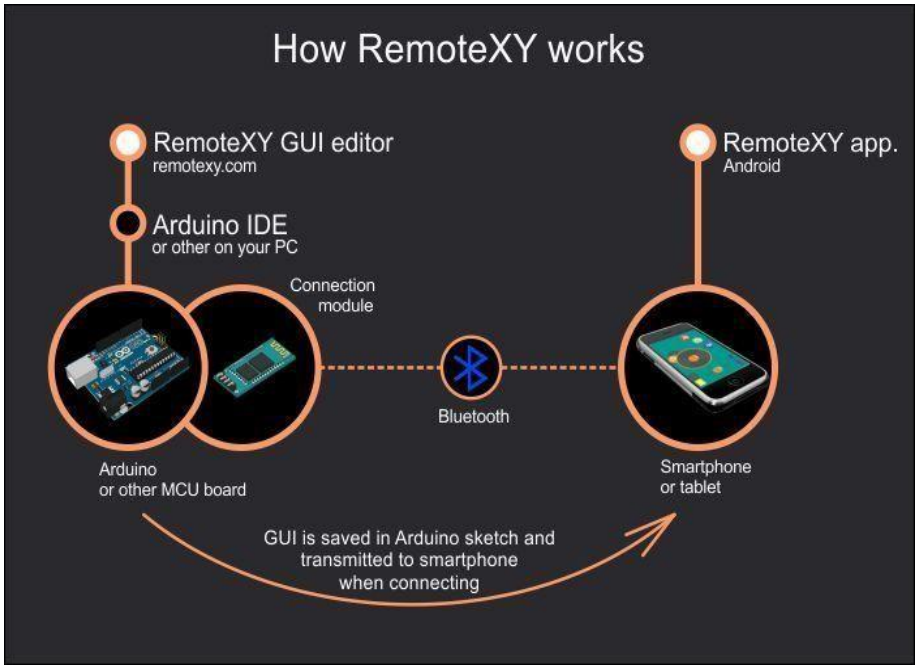


Fig.5- Image representing the working of Arduino UNO with RemoteXY [26]

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**Setting Up Configurations Via RemoteXY**

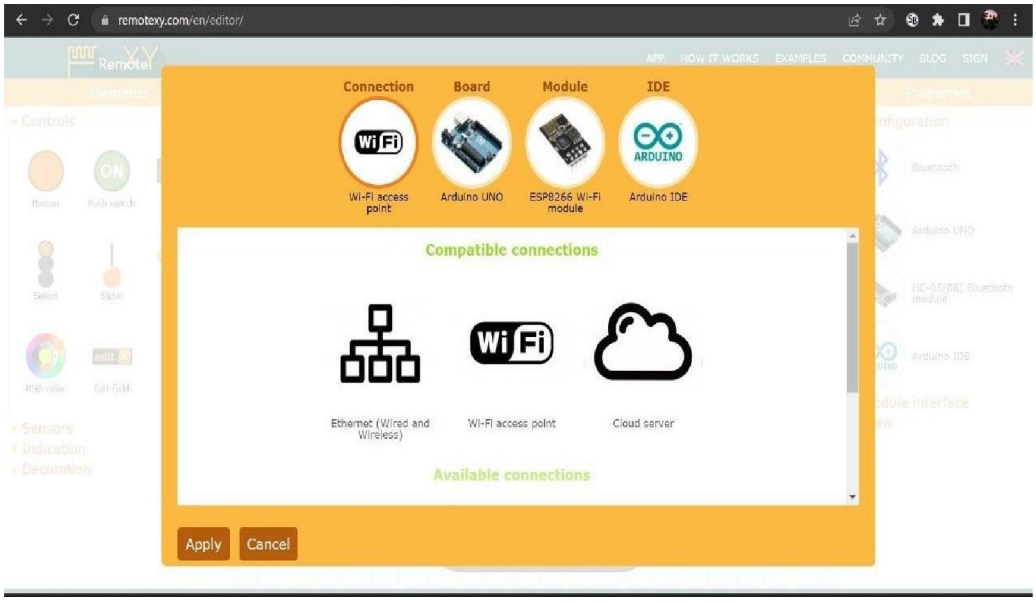


Fig.6- Image showing the available options to setup and configure our Wi-Fi Module

In the figure 6 it can be observed that all the compatible connections which are supported by the RemoteXY Web App. Connections can be made via Wi-Fi, Ethernet and Cloud Server. Apart from Arduino UNO, RemoteXY supports other development boards as well. RemoteXY also supports different types of IDEs (Integrated Development Environment) including Arduino IDE.

**Setting Up Module Interface (Setting Up Baud Rate, Wi-Fi Name and Password)**

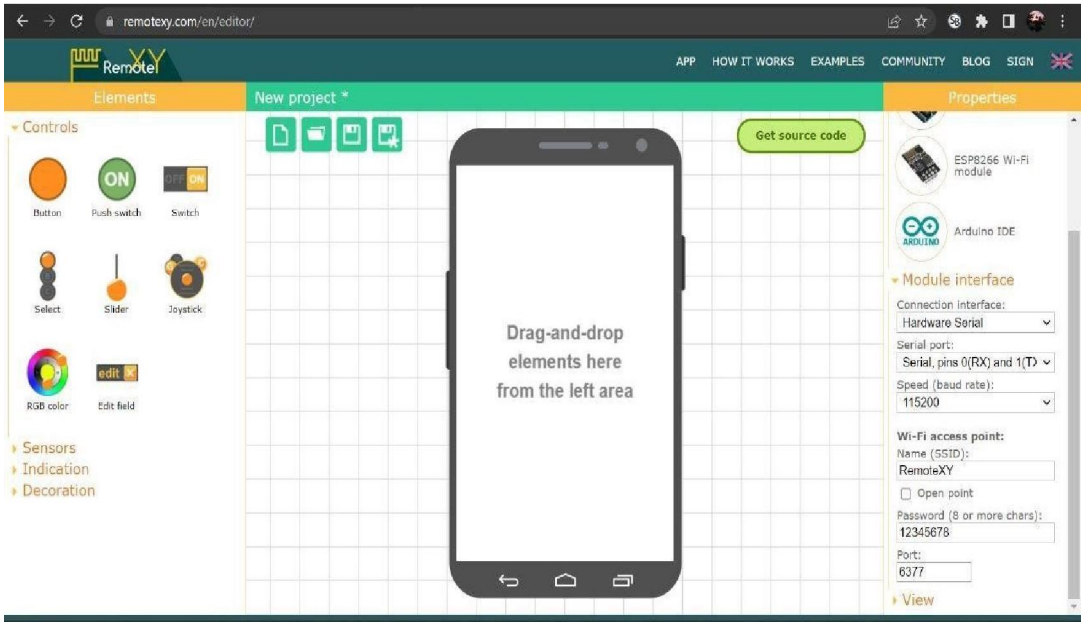


Fig.7- Image showing the menu to configure the module (Refer right pane)

Set up is interfaced in the mobile app via the web browser as shown in Fig.7. Firstly, Setup the Wi-fi Access Point by configuring the Wi-Fi name and the password. Then change the Connection Interface to Hardware Serial. Also select the RX (Receiver) and TX (Transmitter) pins to establish serial communication. The baud rate should be changed in order to ensure proper communication.

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**RemoteXY Web Browser Configuration**

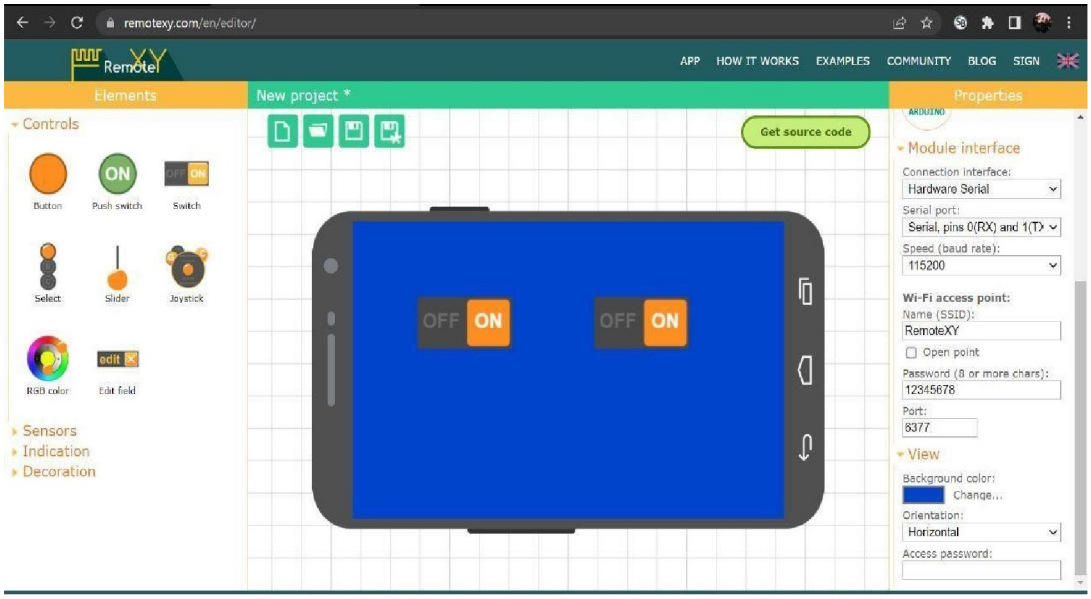


Fig.8- Designing the Mobile App Interface via the Web Editor

As shown in the Fig.8, now set up the control switches in RemoteXY App installed in the mobile device. In this image designing of the interface is done which needs to be displayed on the mobile App. Select two buttons as per the requirement of the circuit.

**Source Code (Generated from RemoteXY)**

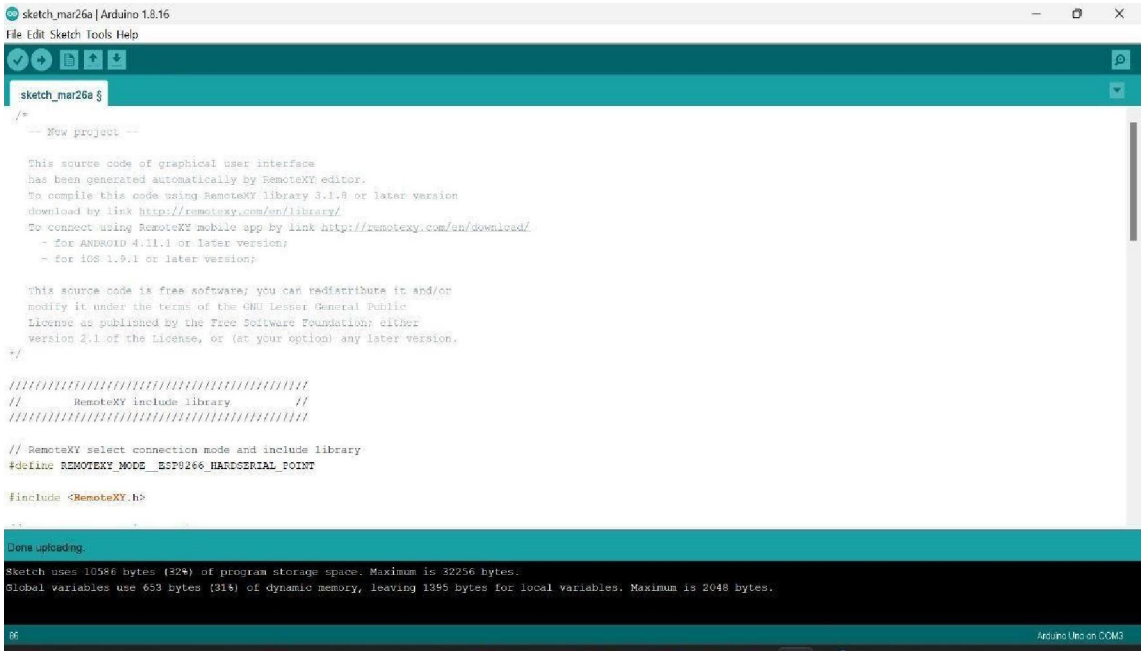


Fig.9- Source Code in Arduino IDE

The source which is generated from RemoteXY app needs to be run in the Arduino IDE for further compilation and uploading it to the Arduino UNO Board. Also add compatible libraries in order to ensure the working of the code with the RemoteXY App.

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**RemoteXY Library Download Page**

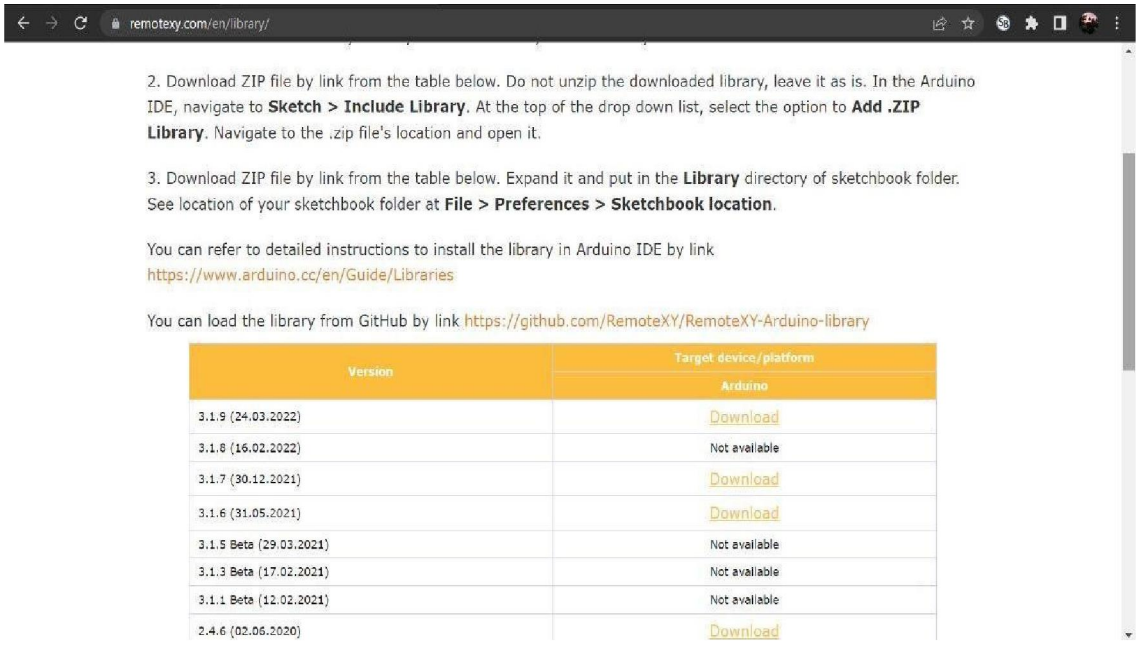


Fig.10- Downloads Section of RemoteXY Library

To make sure that compiled code runs perfectly with RemoteXY App, add RemoteXY Library of latest version in Arduino IDE. As there are multiple versions of RemoteXY available. Select the latest version and it will be downloaded in .zip format.

**Including RemoteXY Library**

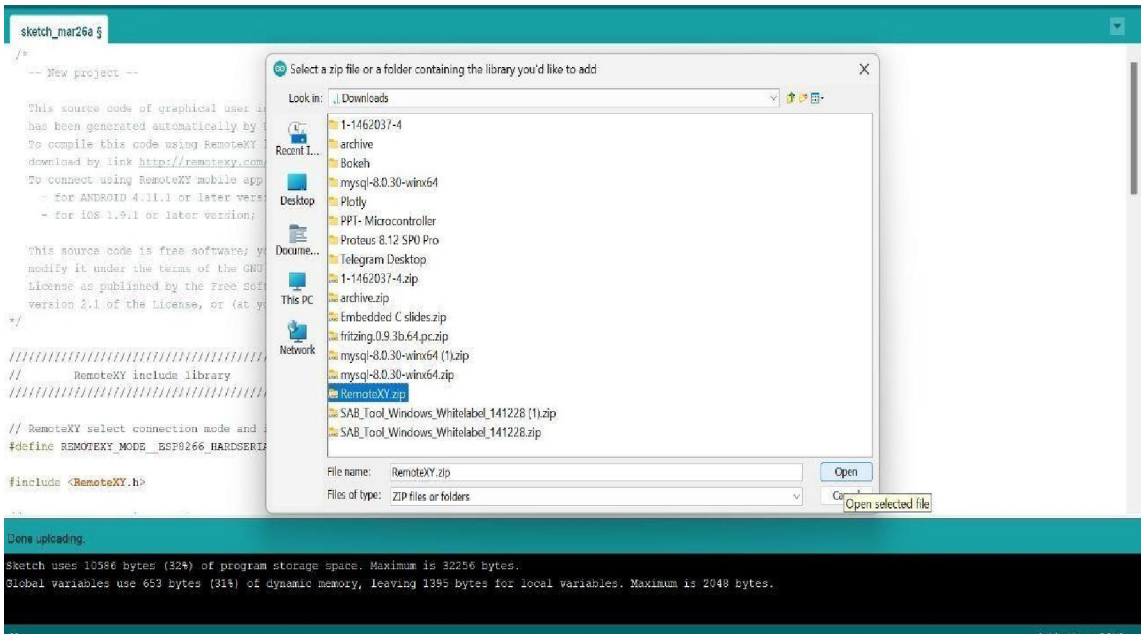


Fig.10- Locating the RemoteXY .zip file

Select the .zip file of RemoteXY Library from its location and upload it. The .zip file is present in the Downloads section as seen in Fig.10.

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**Completed Uploading of Code to Arduino UNO**

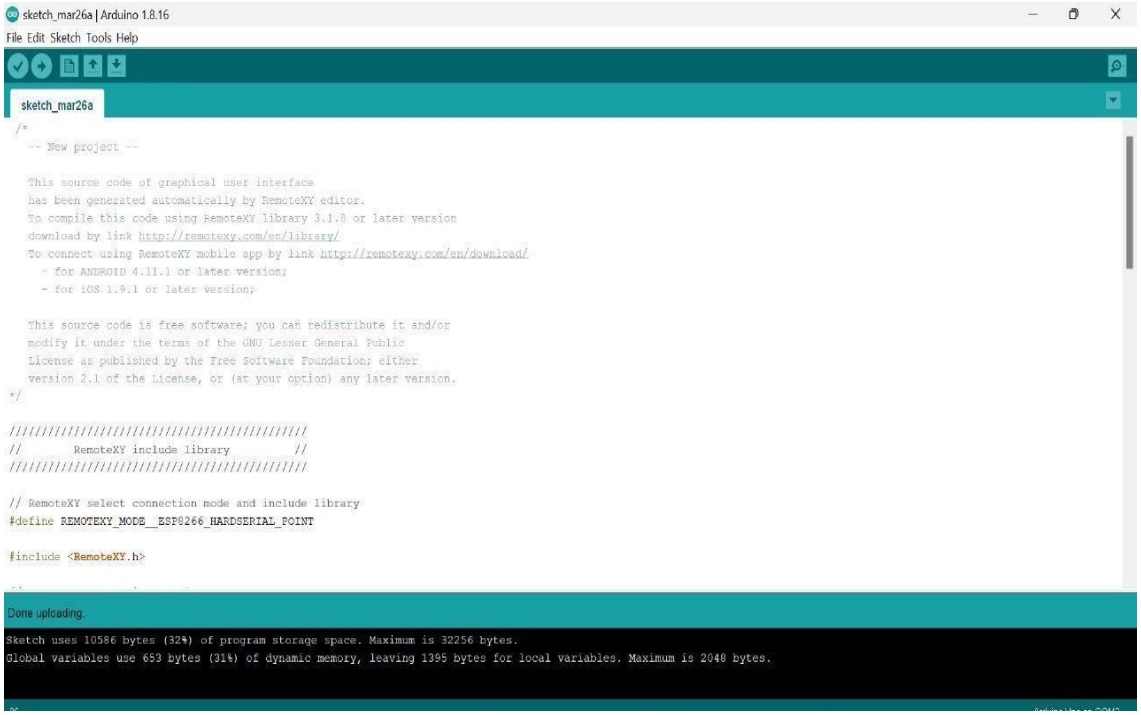


Fig.11- Image showing successful upload of the code to the Arduino UNO Board

After successful compilation, upload the source code to our Arduino UNO Board for further process. As shown in Fig.11, it is successfully uploaded the code to our board.

**Connecting to the Wi-Fi via Mobile App**

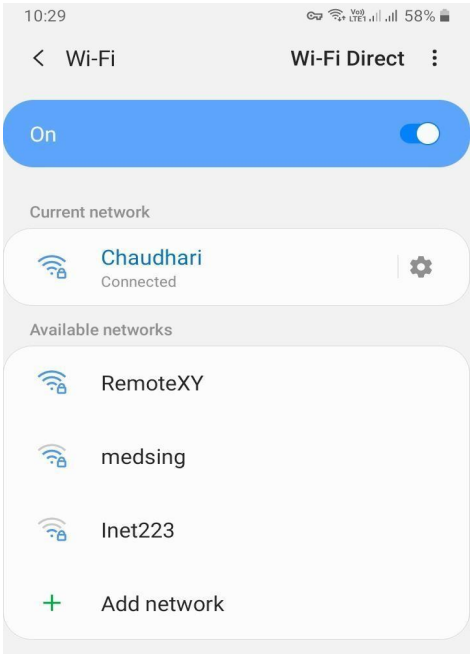


Fig.12 – List of available Wi-Fi networks

In the available networks (Fig.12) the Wi-fi Access point is visible which is set up by the name RemoteXY. Select 'RemoteXY' from the available networks.

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**Connecting to Wi-Fi by adding password**

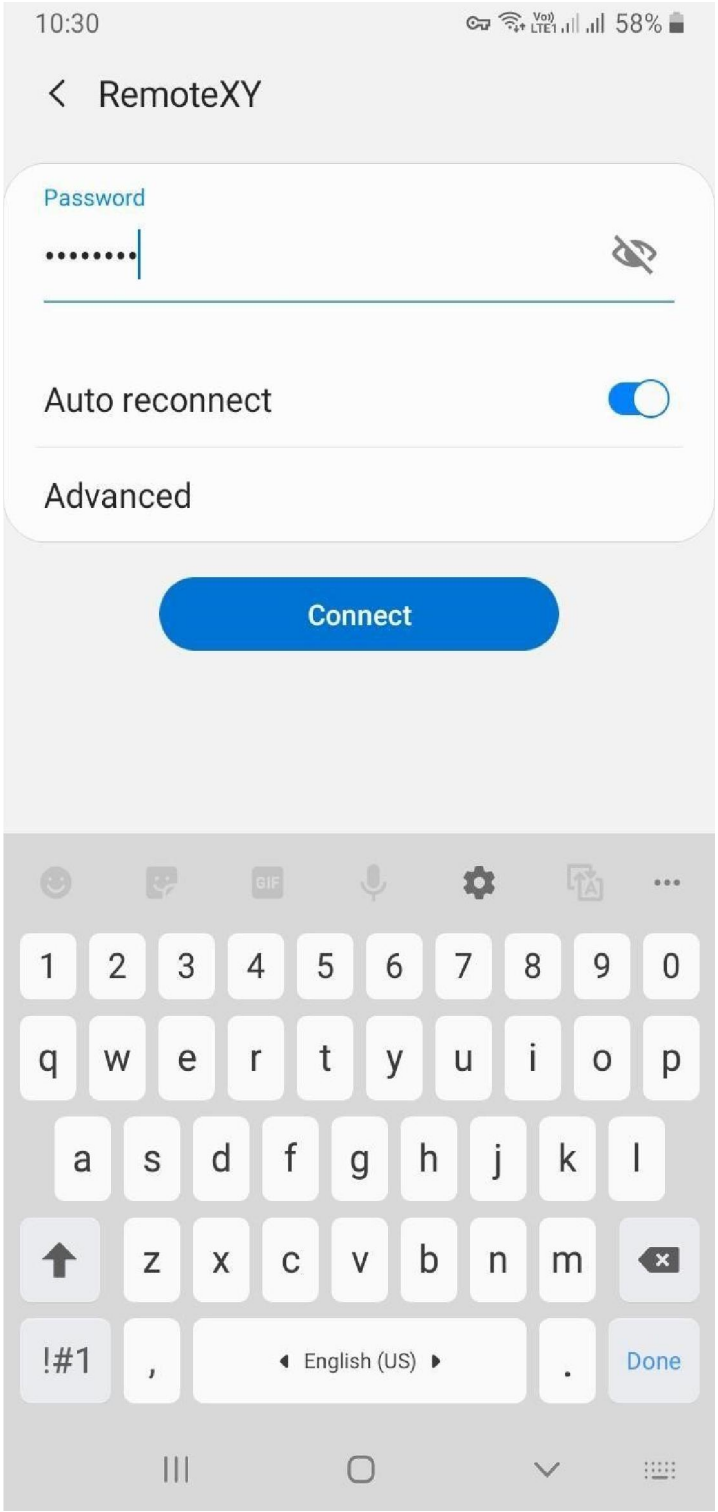


Fig.13- Entering the password to connect to Wi-Fi

In order to connect to the Wi-Fi which is setup, the password has to be entered (Refer Fig.13). The same password has been entered while configuring the interface in the web editor.

Before connecting to Wi-fi App Interface

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Fig.14- Interface after opening the App on mobile

After connecting to the Wi-Fi, open the RemoteXY App on the mobile and find the interface as shown in the fig 14. Click on the '+' icon at right top corner to connect.

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For adding new device, connecting via Wi-fi Point

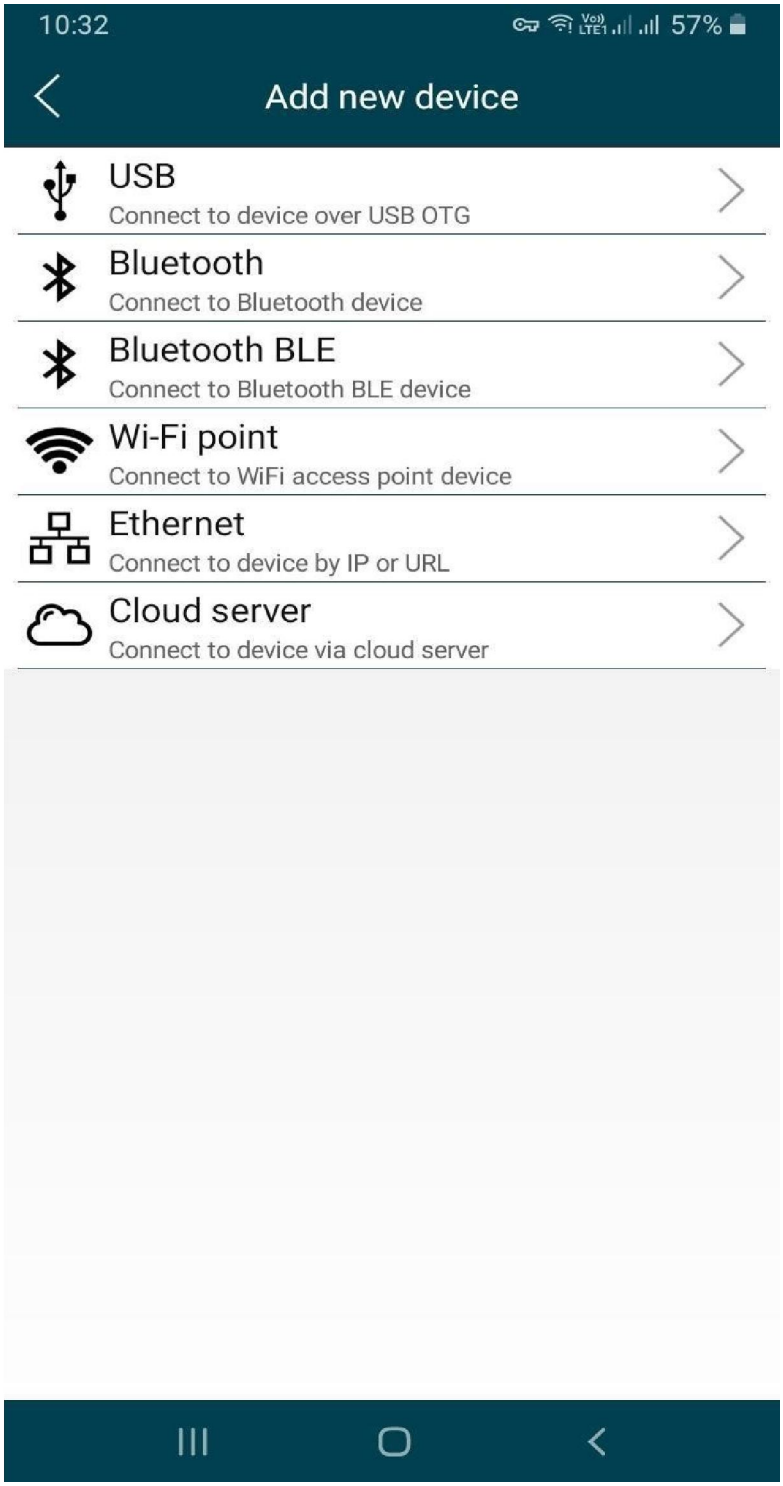


Fig.15- Available connections

After clicking on the plus icon, options are visible to make connections (Refer Fig.15). As Wi-Fi Access point is setup, Select Wi-fi point from the available menu.

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Locating Wi-fi network and establishing connection with Arduino

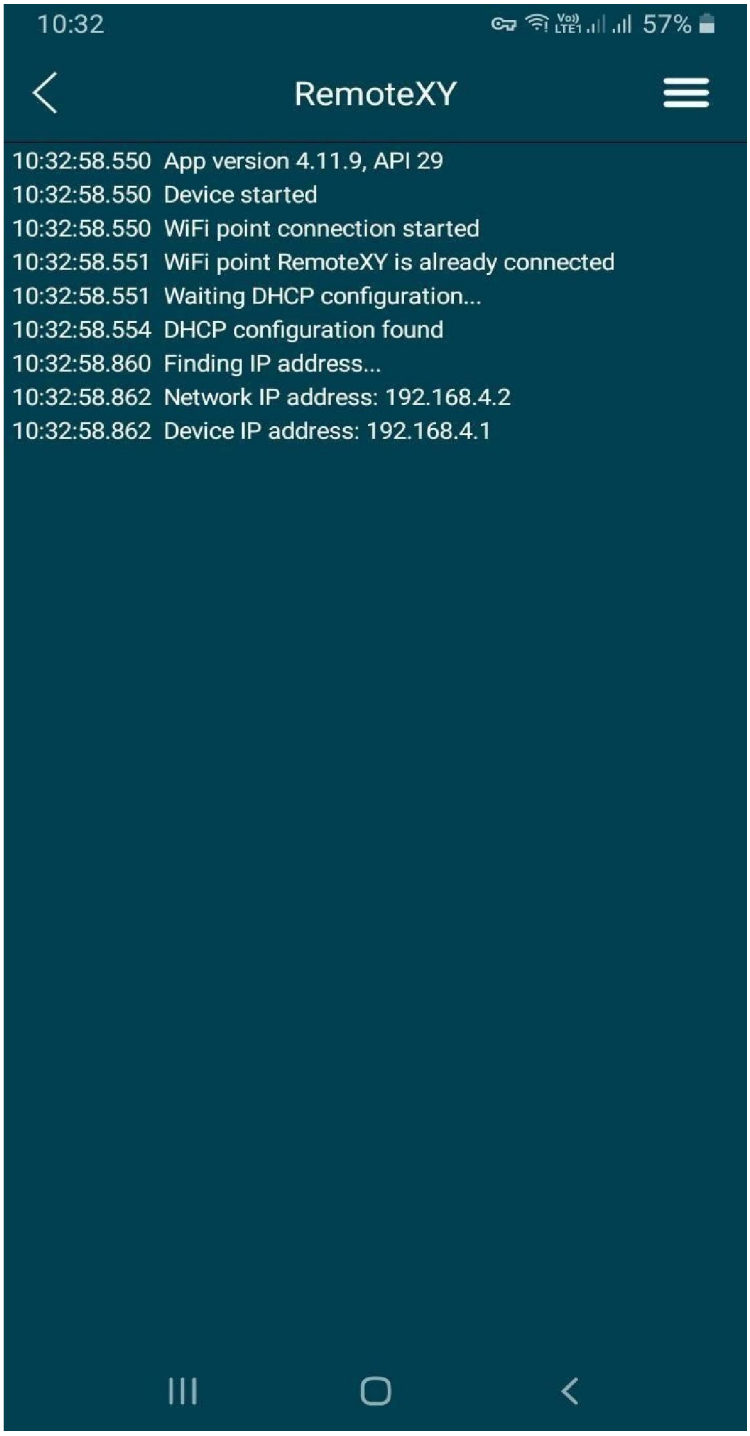


Fig.16- Connection in process

The app will search for nearby Wi-fi connections and locate them and establish a connection. The application will locate the IP address of the device and make a connection as seen in Fig.16.

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App interface after connecting

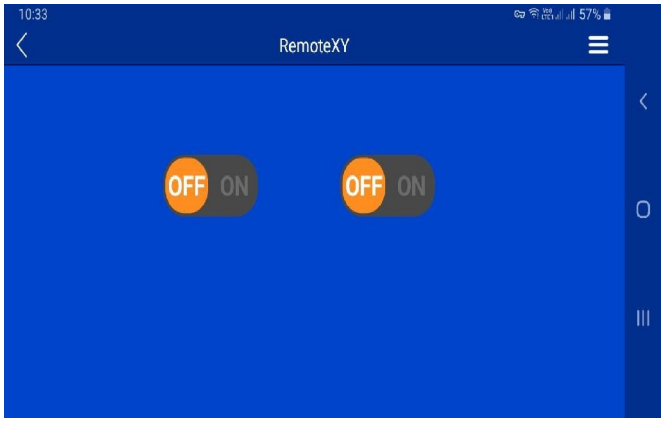


Fig.17- Mobile App Interface

After successfully establishing a connection, the control switches are visible which are designed via the web browser. The two switches which are designed via the web editor. The LEDs can be controlled accordingly.

## VI. SIMULATION

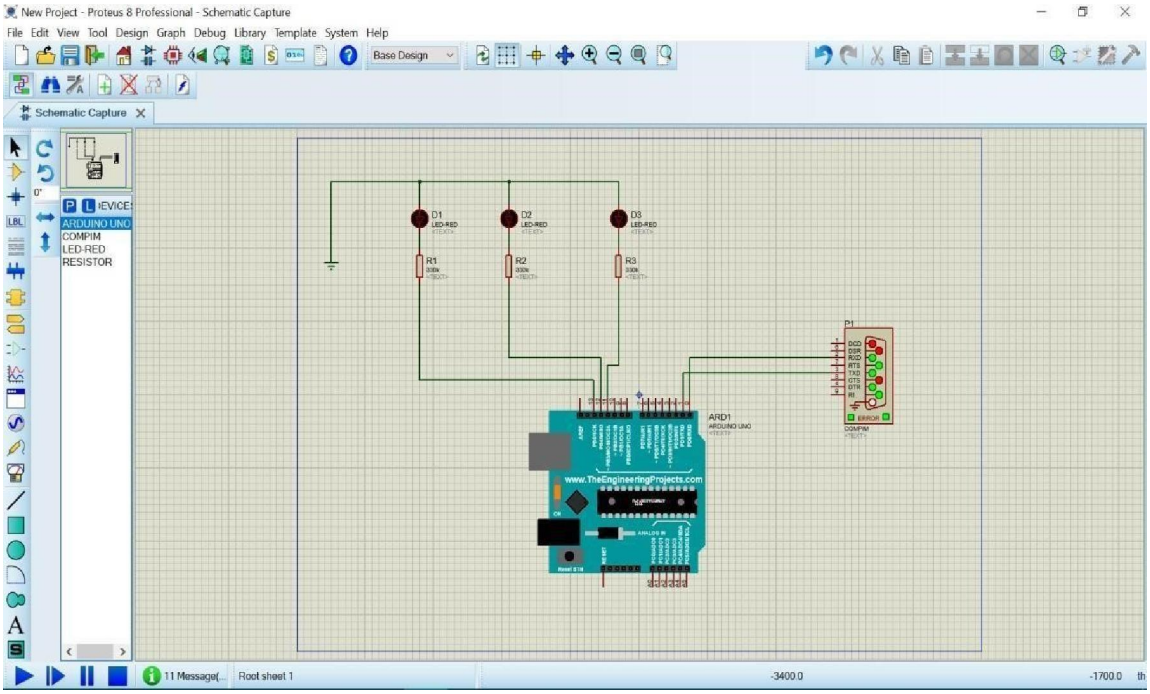


Fig.18- Simulation of the circuit on Proteus using Virtual Port

Figure 18 shows a representation of the circuition simulation platform. Proteus has been used in order to show the simulation. The design has been simulated using the Proteus software to ensure proper operation of the smart electronic samayi. COMPIM is also been used. To model physical com interfaces in proteus COMPIM is been used. It works by capturing and buffering serial signals which it then presents to the electrical circuit.ESP2866 is a Wi-Fi module using this Wi-Fi module internet connection is established.

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## VII. RESULTS

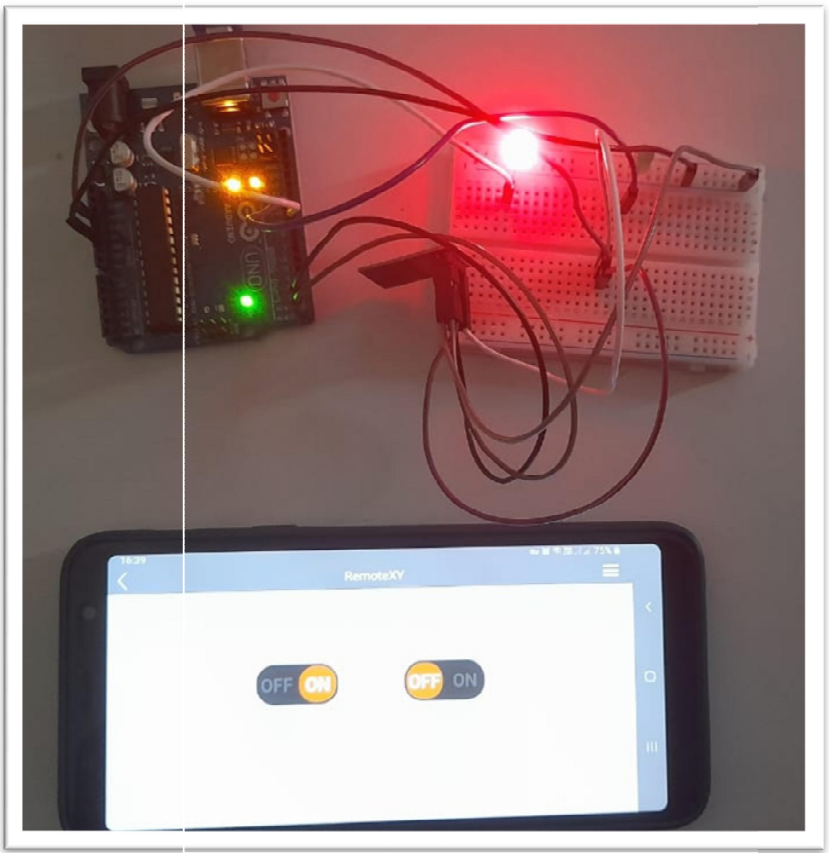


Fig.19- Controlling Red LED with the control switch on the app

As seen in Fig.19 when ON button is clicked through the phone the red LED glows. Similarly it can turn off the red LED via the controls on mobile app.

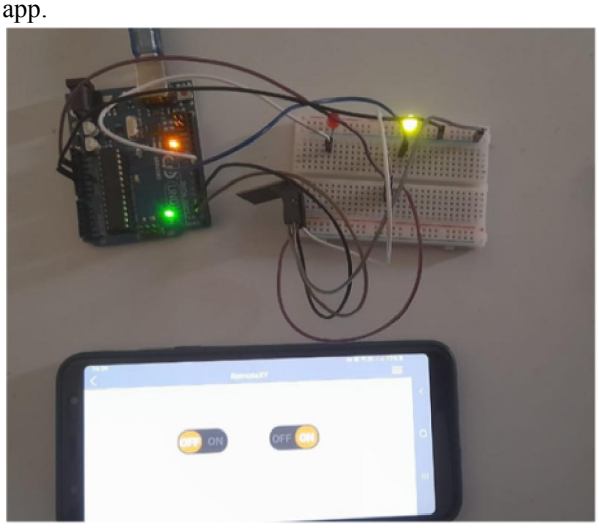

Fig.20- Turning the green LED on using the control switch via the mobile app

The Fig.20 depicts the results of the project.It shows a phone interface which has the app visible with two buttons on it.The connections between ardinuo and breadboard components is clearly visible. When ON button is clicked through the phone the green LED glows.

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## VIII. APPLICATION

- Smart Electronic Samayi can be used in inauguration ceremony
- It can be used for lighting
- Can be used in Temples
- Can be used for decorative purposes
- Can be used for gifting

## IX. FUTURE SCOPE

The future of IoT is exciting and its potential applications are vast , its virtually unlimited due to advances in technology and consumers desire to integrate devices such as smart phones with household machines. The App can be modified with better features like by controlling multiple LEDs, controlling brightness of led, varying ON/OFF time in LEDs. Smart Samayi can be even made smarter by use gas sensors to detect and prevent fire accidents.

## X. CONCLUSION

An electronic Samayi based on IoT offers a range of benefits, including increased energy efficiency, remote control, and enhanced customization options. IoT-enabled lamps(samayi) can be controlled using a smartphone app. Additionally, IoT technology used in this project reduces or strikes out all the disadvantages of a traditional samayi (such as oil spells, fire break outs, air pollution etc.). Overall, an electronic lamp based on IoT is a smart and convenient lighting solution for modern homes and businesses

## ACKNOWLEDGMENT

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## REFERENCES

**[1].** Archana. G, Aishwarya N, Anitha J "Intelligent Street Light System" International Journal of Recent Advances in Engineering & Technology, Vol-3, Issue-4, pp. 76847691, 2015.

**[2].** Akshay Balachandran, Murali Siva, V. Parthasarathi, Surya and Shriram K. Vasudevan "An Innovation in the Field of Street Lighting System with Cost and Energy Efficiency"Indian Journal of Science and Technology,Vol-8,pp.1-5, August 2015

**[3].** Deepanshu Khandelwal, Bijo M Thomas, Kritika Mehndiratta, Nitin Kumar "Sensor Based Automatic Street Lighting system" International Journal of Education and Science Research Review Volume-2, Issue-2, pp. 24 - 27 , April- 2015 .

**[4].** IsahAbdulazeez Watson, OshomahAbdulai Braimah, Alexander Omoregie "Design and Implementation of an Automatic Street Light Control System" International Journal of Emerging Technology and Advanced Engineering, Volume 5, Issue 3, pp. 38 – 47, March 2015.

**[5].** T. McRae, A. Prodic, G. Lisi, W. McIntyre and A. Aguilar, "Hybrid serial-output converter for integrated ledlighting applications", IEEE APEC, D03.8, March 2016.

**[6].** K.A. Kim, P.S. Shenoy and P.T. Krein, "Photovoltaic differential power converter trade-offs as a consequence of panel variation", Control and Modeling for Power Electronics (COMPEL) 2012 IEEE 13th Workshop on, pp.1-7, 2012.

**[7].** S. Bhardwaj, T. Ozcelebi and J. Lukkien, "Smart Lighting using LED Luminaries", 2010 8th IEEE International Conference on Pervasive Computing and Communications Workshops, pp. 654-659, 2010.

**[8].** Parvin S, Shireen S, Pooja K, Prashant T, "IOT Based Reserved Car Parking Slot Using Android Application" International Journal for Research in Applied Science & Engineering Technology (IJSART), ISSN [ONLINE]: 2395-1052, Volume 6 Issue 5 – MAY 2020.

**[9].** Shweta Joshi, Kajal Rathod, Celeste Gudiwada, Prashant Titare, D. G. Khairnar, "Motion Based Message Conveyer for Paralytic or Disabled Person", International Journal for Research in Applied Science & Engineering Technology (IJRASET), ISSN: 2321-9653; Volume 8 Issue II Feb 2020.

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**[10].** Prashant Titare, D.G. Khairnar, "Development of Multiprocessor System on chip using Soft core: A review", International Engineering Research Journal (IERJ), ISSN 2395-1621, pg 390-397, March 2020.

**[11].** Ashmita B, Alka K, Vaishnavi S, Prashant T, "Smart Museum based on IoT", International Research Journal of Engineering and Technology (IRJET), e-ISSN: 2395-0056, Volume: 07 Issue: 04, Apr 2020

**[12].** RutujaNannar, Pratiksha Gosavi, HrutujaSapate, Prashant Titare, D.G. Khairnar "Development of Interconnected Sensor Ecosystem to map, sense and detect Automotive parameters using Multi-Processor", International Research Journal of Modernization in Engineering Technology and Science (IRJMETS), Volume 3, Issue 6, ISSN no. 2582-5208, pp no 785-792, June 2021.

**[13].** Ruchika Ghadage, Sonali Dhakane,KunikaAtram, Prashant Titare, D.G. Khairnar, "Tracking health care system using low cost hospitalized tool and IoT", International Journal of Advances in Engineering and Management (IJAEM), Volume 3, Issue 7, ISSN no. 2395-5252, pp no. 264-266, July 2021.

**[14].** Bhavana Ekunkar, Jagruti Choudhari, Akshata Desai, D. G. Khairnar, Prashant Titare, "Humanoid Robot as Receptionist in Institutes", International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 06, ISSN no. 2395-0056, pp no 3978-3982, June 2021.

**[15].** Swati Nawange, Akash Palhade, Hemant Patil, D. G. Khairnar, Prashant Titare, "Automatic Farm Covering System in unfavorable conditions using Machine Learning &IoT", International Journal of Science Technology & Engineering (IJSTE), Volume: 08 Issue: 02, ISSN no. 2349-7842, pp 06-15, August 2021.

**[16].** Shital Swami, Pratiksha Akhade, Deepak Sarode, Prashant Titare, D. G. Khairnar, "Design of Automated Conveyor Belt To Identify The Quality Of Guava Fruits And Sort Them Using IOT, Image Processing And Control Automation", International Research Journal of Modernization in Engineering Technology and Science, e-ISSN: 2582-5208, Volume:04, Issue:05, May 2022.

**[17].** Sristi Prasad, Richa Raut, Sandhya Biradar, Prashant Titare, D. G. Khairnar "IOT based Smart Shelves for Retail", International Journal of Scientific & Engineering Research (IJSER), ISSN 2229-5518, Vol. 3, Issue 2, Sept 2022.

**[18].** PS Titare, DG Khairnar, "MPSoC design and implementation using microblaze soft core processor architecture for faster execution of arithmetic application", International Journal of High Performance Systems Architecture 11 (3), 156-168. Nov 2022 (in press)

**[19].** https://www.electronicshub.org/simple-clap-switch-circuit/

**[20].** https://docs.arduino.cc/hardware/uno-rev3

**[21].** https://www.arduino.cc/reference/en/

**[22].** https://www.electronicshub.org/soldering

**[23].** https://www.elprocus.com/what-is-a-clap-switch-circuit-diagram-its-working/

**[24].** https://youtu.be/IcEmUOmZ19c

**[25].** https://youtu.be/KCGlOvU8M3E

**[26].** https://remotexy.com/en/help/