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Belgaum, Karnataka- 590014**



**First Year
A Mini-Project Report
On
“Project Title”**

Submitted in the partial fulfilment of the requirements for the award of the Degree
of
BACHELOR OF ENGINEERING
In
**COMPUTER SCIENCE AND ENGINEERING
DATA SCIENCE**

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2022-2023

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Certificate

This is to certify that the Mini Project Work entitled “**Project Title**” is a bona fide work carried out by **ANUSHA R (1DS22CD009)**, **CHAITANYA RAVI JAISWAL (1DS22CD013)**, **SHIVAM PODDAR (1DS22CD045)** and **TANMAY J POBBATHI (1DS22CD054)**, in partial fulfilment for the II semester of Bachelor of Engineering in CSE (Data Science) of the Visvesvaraya Technological University, Belgaum during the year 2022-2023. The Project report has been approved as it satisfies the academics prescribed for the Bachelor of Engineering degree.

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CONTENTS

Abstract

Chapter1 Introduction.....Pg No.

1.1 Introduction

1.2 Problem statement

1.3 Objectives and Scope of Project

1.4 Motivation of Project

Chapter 2 Literature Survey.....Pg No.

Chapter 3 RequirementsPg No.

3.1 Software Requirements

3.2 Hardware Requirements

Chapter 4 System DesignPg No.

4.1 Existing system

4.2 Proposed system

4.3 System Architecture

Chapter 5 ConclusionPg No.

References

ABSTRACT

The world is moving faster towards automation. People have less time to handle any work so automation is a simple way to handle any device or machine which will work to our desire. This paper's aim is to develop and design a Home automation using Arduino with Bluetooth module. Home automation system gives a simple and reliable technology with Android application. Home appliances like fan, Bulb, AC, automatic door lock are controlled by Home automation system using Arduino Uno with Bluetooth module. These devices can be controlled through a web application or via Bluetooth Android based Smart phone app. This paper focuses on monitoring and controlling of smart home by Android phone and provides a security based smart home, when people are not present at home.

Chapter 1

INTRODUCTION

This project presents a wireless Home Automation System (HAS) using Android. This concept is designed to assist and provide support to the needs of people at home. The idea of Home Automation reduces manpower at home. This HAS is very useful to the disabled people. The automation process is completely controlled by Bluetooth and android OS. Nowadays, everyone has a smart phone with android application, used to control appliances using simple click and voice commands. Commands are passed through Bluetooth present in the mobile, which provides a convenient way to control and monitor the devices at home. Voice command is transmitted to the Bluetooth module through Android phone and graphical User Inter Face (GUI) commands are transmitted to the Bluetooth module through Android App. At a time, we can give any one of the command to the Bluetooth module either voice or GUI command. This design is independent of conventional switches. The electrical appliances can be operated (On or OFF condition) without the need of a conventional switch.

So, this concept is cost effective, user friendly, time efficient and also reduces wiring cost.

PROBLEM STATEMENT

In a hurry, People forget to switch off the appliances which results in more electricity consumption. Many existing systems are not designed with energy efficiency in mind and may not provide users with the tools needed to effectively manage electricity usage. The goal of this project is to develop a smart home automation system that focuses on reducing electricity consumption. The system should provide users with real-time information about their electricity usage, and should offer features such as scheduling and automation to help them reduce their consumption.

OBJECTIVE AND SCOPE

The objective of the smart home automation project using Arduino and a Bluetooth module is to create a cost-effective and user-friendly system that allows users to remotely control and automate various devices in their home. The project aims to enhance convenience, energy efficiency, and overall control by providing a smartphone-based interface to turn devices on/off and set timers, thus transforming a traditional home into a smart, interconnected environment. The scope of the smart home automation project involves creating a user-friendly system using Arduino and a Bluetooth module to enable remote control and automation of household devices through a dedicated smartphone app. The project will encompass device on/off control and timer setting capabilities, enhancing convenience and energy efficiency. The communication between the Arduino and the app will be established via Bluetooth, allowing users to operate devices within close proximity. The initial phase will focus on basic functionalities, including device control and timer settings, while also ensuring safety and affordability. The project's expandability will be considered for potential future additions such as sensor integration, voice control, and internet-based remote access.

MOTIVATION OF PROJECT

The motivation behind this project is to save electricity is rooted in the growing emphasis on environmental sustainability, cost efficiency, and energy conservation. Smart home systems offer a suite of features that collectively contribute to reducing electricity consumption. By remotely managing devices, scheduling their operation, and utilizing occupancy sensing, energy wastage during idle periods is minimized. Adaptive lighting, temperature control, and real-time energy monitoring further optimize energy use. These systems also enable users to remotely monitor and adjust device settings through smartphone apps. Through customization and integration with renewable energy sources, smart home automation serves as a practical solution to curbing energy consumption, aligning with global sustainability goals while simultaneously lowering utility bills.

CHAPTER 2

LITERATURE SURVEY

This section provides the possible methods suggested by the researchers in the past in the field of home automation. Wook-SungYoo and Sameer Ahamed Shaikin's work have presented an application of home automation using Bluetooth. Pooja N. Pamar and others have presented a method to control the home appliances through Internet and Arduino controller . While C S Tyagi and others have developed a Home Automation method where appliances are controlled through voice commands using Arduino and Android OS. Similarly the method suggested by Sriskanthan and Karande operated the Home appliances through a RS232 network using Bluetooth module. Baris Yuksekkaya and others have developed an Home appliances automation using GSM, Internet and speech. Microprocessor is used to process the signals from RF antenna . Rajeev Piyare and Tazil M. have developed a Home appliances automation method using PC/Laptop or Android cell phone . Sandeep Kumar and Mohammed A Qadeer developed a method using Bluetooth module . H Kanma and others developed a home appliances control system using Separate Bluetooth module without android OS. 32S Tharishny and others have developed using Bluetooth and Internet which supports password protection to control the appliances. The detailed survey on home controlled automation using GSM and Bluetooth considering parameters of efficiency, Android apps, Microcontrollers and Communications has provided avenues to explore other alternative and efficient method for home appliance control system .

CHAPTER 3

REQUIREMENTS

HARDWARE REQUIREMENTS:

- Arduino controller
- Bluetooth module
- Relay driver
- Breadboard
- Jumper wires

SOFTWARE REQUIREMENTS

- Programming language like Arduino IDE
- Android application
- MIT app inventor

CHAPTER 4

SYSTEM DESIGN

EXISTING SYSTEM

Earlier, In the field of smart home automation using Bluetooth module, users were able to connect and control home appliances on an on/off basis. But it was a bit inconvenient for users to operate, as they can't control appliances when they are occupied with other works.

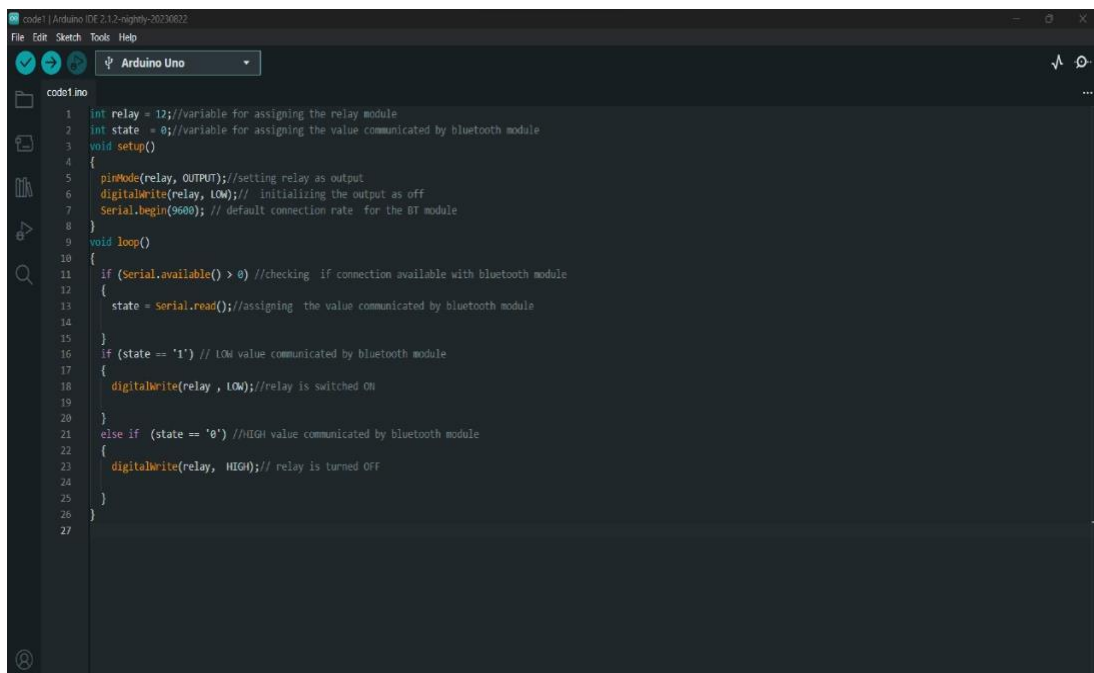
PROPOSED SYSTEM

In order to increase the user convenience, the system is designed in such a way that appliances can now be controlled on a timer basis.

For instance if user need to switch off appliance like bulb after a particular time, they can set a timer and the device will automatically be switched off, until their next command.

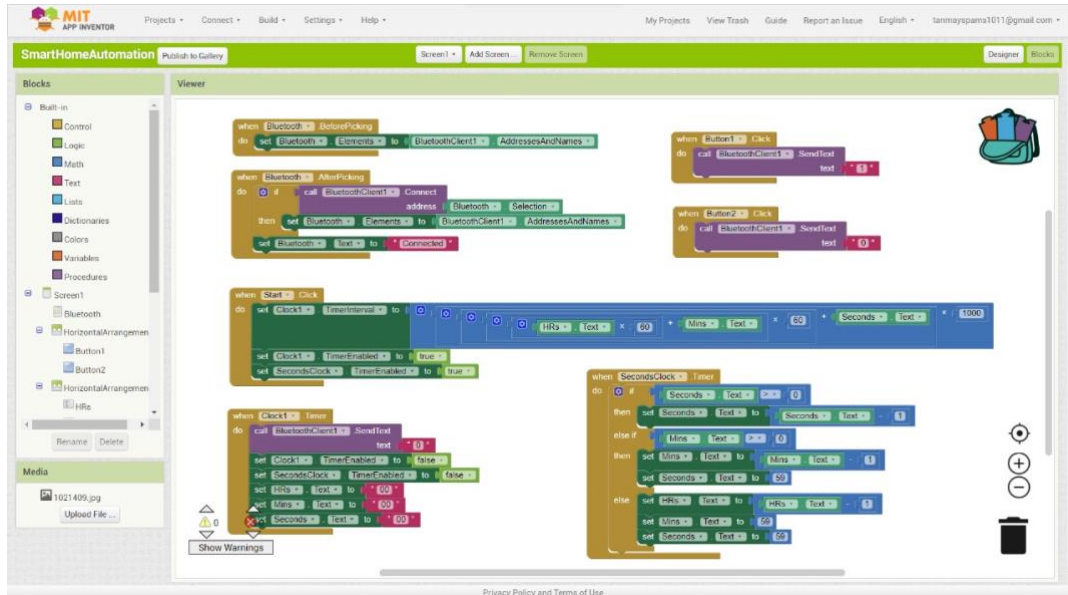
SYSTEM ARCHITECTURE

ARDUINO CODE:

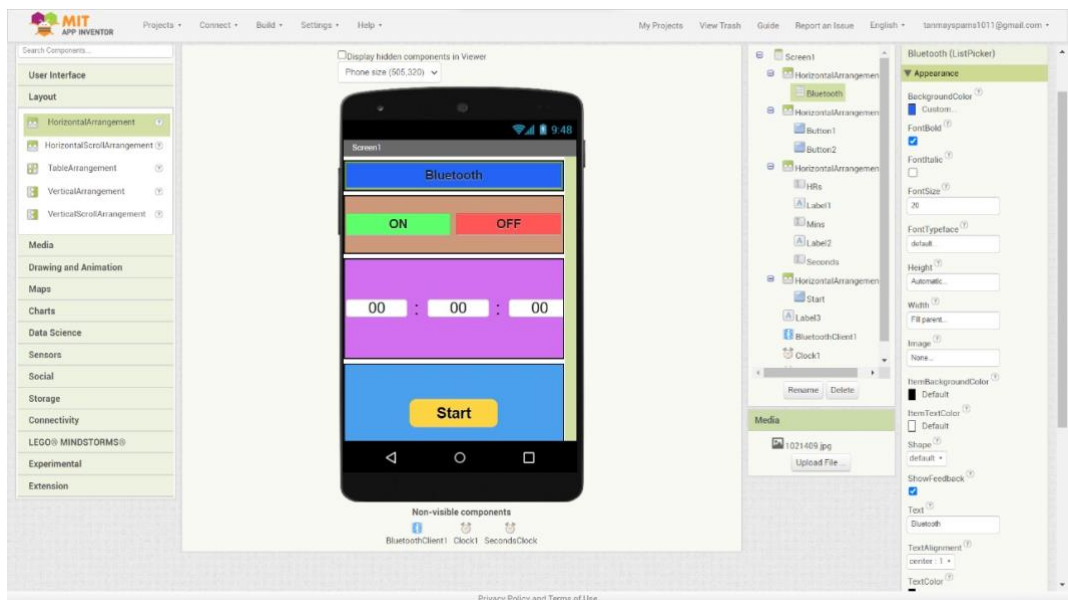


```
1 int relay = 12; //variable for assigning the relay module
2 int state = 0; //variable for assigning the value communicated by bluetooth module
3 void setup()
4 {
5   pinMode(relay, OUTPUT); //setting relay as output
6   digitalWrite(relay, LOW); // initializing the output as off
7   Serial.begin(9600); // default connection rate for the BT module
8 }
9 void loop()
10 {
11   if (Serial.available() > 0) //checking if connection available with bluetooth module
12   {
13     state = Serial.read(); //assigning the value communicated by bluetooth module
14   }
15   if (state == '1') // LOW value communicated by bluetooth module
16   {
17     digitalWrite(relay, LOW); //relay is switched ON
18   }
19   else if (state == '0') //HIGH value communicated by bluetooth module
20   {
21     digitalWrite(relay, HIGH); // relay is turned OFF
22   }
23 }
24
25
26
27
```

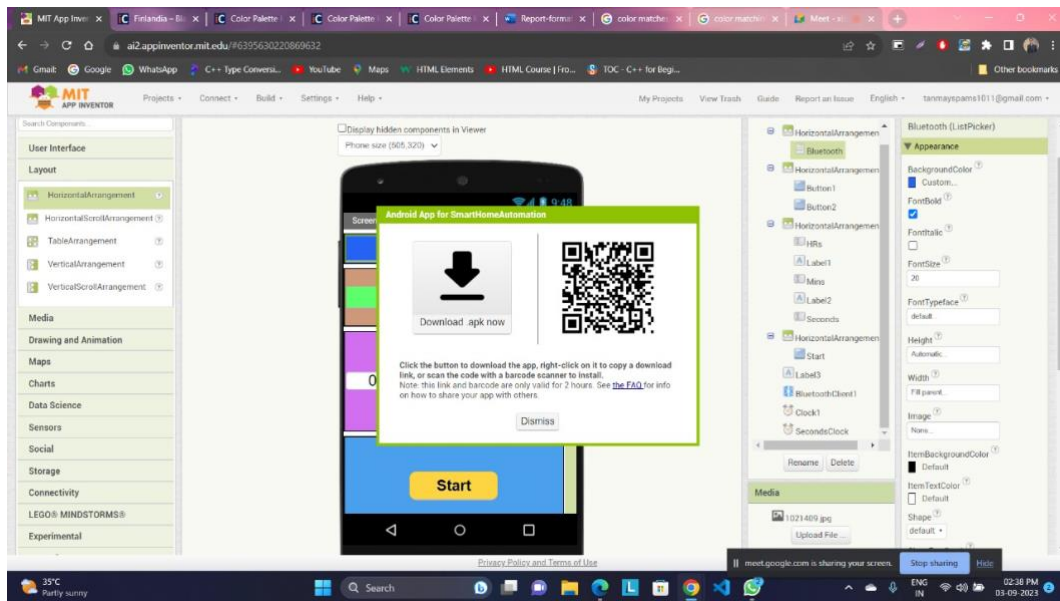
BLOCK CODE TO DEVELOP APP IN MIT APP INVENTOR



BLUETOOTH APP:



QR CODE TO DOWNLOAD APP:



WORKING MODEL:



CHAPTER 5

CONCLUSION

The proposed work has developed a Home Automation using Bluetooth, Android and Arduino. This is a cost effective, low maintenance and user friendly automation system to help the elderly and differently abled people. Main motive of this project is to have a centralized control system to operate the appliances through a Android phone. It also saves the time for operating appliances to the consumers. Conventional switches needs more wires for connecting load. But in proposed system, the need for wire is drastically reduced. The appliances in the home can be controlled and its status (ON or OFF condition) can be monitored from a remote location. The idea proposed in this project can also be extended for the automation of industries, malls and hospitals.

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