

**SCHOOL OF COMPUTER SCIENCE AND ENGINEERING**

A Skill Development Project Report

on

Room light controlling app

Submitted in fulfillment of the requirements for the award of the Degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

Submitted by

Likithashree R20EF362

Shravanthi R20EF380

Vidyashree R20EF390

Pradhumna R20EF420

2022-23

Rukmini Knowledge Park, Kattigenahalli, Yelahanka, Bengaluru-560064

www.reva.edu.in

**DECLARATION**

We, Ms./mr Likithashree,Shravanthi,Vidyashree,Pradhumna students of Bachelor of Technology, belong in to School of Computer Science And Engineering, REVA University, declare that this Skill development Project Report / Dissertation entitled “ light controlling app” is the result the of Skill development program done at School of Computer Science And Engineering, REVA University.

We are submitting this Skill development Project Report / Dissertation in partial fulfillment of the requirements for the award of the degree of Bachelor of Engineering in Computer Science and Engineering by the REVA University, Bangalore during the academic year 2022-23

*Signature of the candidates with dates*

1. Likithashree.S
2. Shravanthi C.K
3. Vidyashree gouda
4. Pradhumna

*Certified that this project work submitted b* Likithashree,Shravanthi,Vidyashree,Pradhumna  *has been carried out and the declaration made by the candidate is true to the best of my knowledge.*

|  |  |  |
| --- | --- | --- |
|  |  | *Signature of Director of School* |
|  |  | *Date: …………….* |
|  |  | *Official Seal of the School* |



**SCHOOL OF** **COMPUTER SCIENCE AND ENGINEERING.**

**CERTIFICATE**

Certified that the Skill Development project work entitled  **LIGHT CONTROLLING APP** carried out under my / our guidance by Likithashree,Shravanthi,Vidyashree,Pradhumna, **R20EF362, R20EF380, R20EF390, R20EF420** are bonafide students of REVA University during the academic year 2022-23, are submitting the Skill development project report in partial fulfillment for the award of **Bachelor of Technology** in Computer Science And Engineering during the academic year **2022-23.**

|  |  |  |
| --- | --- | --- |
|  |  | **Signature with date** |
|  |  |  |
|  |  |  |
|  |  | **<Name of the Director>** |
|  |  | **Director** |

**Contents**

Abstract

1. Introduction
2. Positioning
   1. Problem statement
   2. Objectives
   3. Goals
3. Project Scope
4. Methodology
5. Modules identified
6. Project Implementation.
   1. Description of Technology Used
7. Findings / Results of Analysis
8. Conclusions
9. Future Enhancements
10. References

**Abstract:**

The Room Light Controlling App project is an innovative solution for controlling the lighting in a room using a mobile application. The project involves the development of a microcontroller-based circuit, a mobile application, and a Wi-Fi module. The mobile application will allow users to turn on/off the lights, adjust the brightness, change the color of the lights, and set up schedules for automatic control of the lighting. The project aims to provide a convenient and efficient way of controlling the lighting in a room using a mobile device. The project challenges include developing a microcontroller-based circuit that interfaces with the lighting system and developing a mobile application that is compatible with both Android and iOS platforms.

**Introduction:**

The Room Light Controlling App project is an innovative solution for controlling the lighting in a room using a mobile application. With the advancement of technology, the traditional methods of controlling lighting systems have become outdated and inconvenient. The Room Light Controlling App project aims to provide a more convenient and efficient way of controlling the lighting in a room, by developing a microcontroller-based circuit that is connected to a mobile application.

The project aims to provide a user-friendly interface that will allow users to control the lighting in the room using a mobile device. The mobile application will enable users to turn on/off the lights, adjust the brightness. Moreover, the application will provide an option to set up schedules for automatic control of the lighting system. This feature will allow users to control the lighting in the room without physical interaction, making it more convenient and efficient.

The project will involve the development of a microcontroller-based circuit that controls the lighting system and a Wi-Fi module that will enable communication with the mobile application. The mobile application will be developed for both Android and iOS platforms, making it compatible with most mobile devices.

In conclusion, the Room Light Controlling App project aims to provide a more convenient and efficient way of controlling the lighting in a room using a mobile application. The project will bring significant improvements to modern home automation systems, making it a necessary innovation for households worldwide.

1. **Positioning**
   1. **Problem statement:** Traditional methods of controlling room lighting are inconvenient and lack automatic control, resulting in energy waste and higher bills. The Room Light Controlling App project aims to develop a mobile application that provides a user-friendly interface and automatic control of lighting systems, addressing these limitations.
   2. **Objectives:**

* To develop a microcontroller-based circuit that interfaces with the lighting system and controls the lighting in the room.
* To develop a mobile application that is compatible with both Android and iOS platforms and communicates with the microcontroller-based circuit to provide seamless control of the lighting system.
* To provide a user-friendly interface that enables users to turn on/off the lights, adjust the brightness using a mobile device.
* To provide an option for users to set up schedules for automatic control of the lighting system, reducing energy waste and saving electricity bills.
* To ensure the safety of the lighting system by implementing measures to prevent short circuits and overload.
* To conduct testing and debugging of the microcontroller-based circuit and the mobile application to ensure their proper functioning and compatibility.
* To deliver a functional and reliable solution for controlling the lighting system in a room using a mobile application.
* To contribute to the development of modern home automation systems and provide an innovative solution to control the lighting in a room using a mobile device.
  1. **Goals:**
* To improve the convenience and efficiency of controlling the lighting in a room by developing a mobile application that provides seamless control of the lighting system.
* To reduce energy waste and save electricity bills by providing automatic control of the lighting system through the mobile application.
* To contribute to the development of modern home automation systems by providing an innovative solution for controlling the lighting in a room using a mobile device.
* To provide a user-friendly interface that enables users to control the lighting system with ease and simplicity.
* To ensure the safety of the lighting system by implementing measures to prevent short circuits and overload.
* To develop a functional and reliable solution that meets the requirements of modern users for controlling the lighting in a room.
* To promote environmental sustainability by reducing energy waste and contributing to the development of eco-friendly solutions for modern households.
* To provide a cost-effective solution for controlling the lighting system in a room, ensuring affordability and accessibility for users.

1. **Project Scope**

The scope of the Room Light Controlling App project includes:

* Development of a microcontroller-based circuit that interfaces with the lighting system in the room and enables control of the lighting system through the mobile application.
* Development of a mobile application that is compatible with both Android and iOS platforms and communicates with the microcontroller-based circuit to provide seamless control of the lighting system.
* Implementation of a user-friendly interface that enables users to turn on/off the lights, adjust the brightness, and change the color of the lights using a mobile device.
* Development of an option for users to set up schedules for automatic control of the lighting system, reducing energy waste and saving electricity bills.
* Implementation of measures to ensure the safety of the lighting system, such as overload protection and short circuit prevention.
* Testing and debugging of the microcontroller-based circuit and the mobile application to ensure their proper functioning and compatibility.
* Documentation of the project, including the system architecture, circuit diagrams, and source code.
* Delivering a functional and reliable solution for controlling the lighting system in a room using a mobile application.

The project does not include the development of hardware for the lighting system itself, such as the light fixtures and bulbs. The project also does not include the integration of other home automation systems or devices, such as heating or cooling systems.

1. **Methodology**

The methodology for the Room Light Controlling App project involves the following steps:

Requirements gathering: Collecting and analyzing the requirements for the project, including the features of the mobile application, the specifications of the microcontroller-based circuit, and the safety measures to be implemented.

Design: Creating the system architecture, circuit diagrams, and interface design for the mobile application. This step involves selecting the appropriate hardware components and programming language for the microcontroller-based circuit and choosing the appropriate software development platform for the mobile application.

Implementation: Building the microcontroller-based circuit and developing the mobile application according to the design specifications. This step includes writing the source code, configuring the hardware components, and testing the system components separately.

Integration: Integrating the microcontroller-based circuit and the mobile application and conducting end-to-end testing of the system. This step involves verifying the compatibility of the hardware and software components and ensuring that the system functions as intended.

Testing: Conducting comprehensive testing of the system to ensure that it meets the requirements and functions as intended. This step includes testing the system for user-friendliness, reliability, and safety.

1. **Modules identified:**

The following are the modules identified for the Room Light Controlling App project:

User Interface Module: This module is responsible for providing an intuitive and user-friendly interface for the mobile application. The user interface module includes features such as on/off switch, brightness control, and color selection.

Microcontroller Module: This module is responsible for interfacing with the lighting system and processing the user inputs received through the mobile application. The microcontroller module includes features such as overload protection and short circuit prevention.

Communication Module: This module is responsible for establishing communication between the microcontroller and the mobile application. The communication module includes features such as Bluetooth or Wi-Fi connectivity.

Scheduler Module: This module is responsible for enabling users to set up schedules for automatic control of the lighting system. The scheduler module includes features such as timer and calendar functions.

Database Module: This module is responsible for storing and retrieving user preferences and lighting system settings. The database module includes features such as data encryption and backup and restore functions.

Debugging and Testing Module: This module is responsible for testing and debugging the microcontroller-based circuit and the mobile application. The debugging and testing module includes features such as error logging and diagnostic functions.

Documentation Module: This module is responsible for creating and maintaining the project documentation, including the system architecture, circuit diagrams, and source code.

Overall, the modules identified for the Room Light Controlling App project provide a comprehensive solution for controlling the lighting system in a room using a mobile application.

1. **Project Implementation**.
   1. **Description of Technology Used:**

The Room Light Controlling App project uses a combination of hardware and software technologies to provide a functional and reliable solution for controlling the lighting system in a room using a mobile application. The following is a description of the technology used in the project:

Microcontroller: The project uses a microcontroller-based circuit to interface with the lighting system and control the lighting in the room. The microcontroller used in the project is an Arduino board, which is a popular open-source hardware platform for building digital devices and interactive objects.

Bluetooth or Wi-Fi Module: The project uses a Bluetooth or Wi-Fi module to establish communication between the microcontroller and the mobile application. This enables users to control the lighting system in the room from their smartphones or other mobile devices.

Mobile Application Development Platform: The project uses a mobile application development platform to build the mobile application. The mobile application development platform used in the project is Android Studio, which is a popular integrated development environment for building Android applications.

Programming Languages: The project uses various programming languages to develop the microcontroller-based circuit and the mobile application. The programming languages used in the project include C++, Java, and XML.

Database Management System: The project uses a database management system to store and retrieve user preferences and lighting system settings. The database management system used in the project is SQLite, which is a lightweight and efficient relational database management system.

Overall, the Room Light Controlling App project uses a combination of hardware and software technologies to provide a comprehensive solution for controlling the lighting system in a room using a mobile application.

**Signup Page:**

import { StyleSheet, Text, View,Button } from 'react-native';

import { TextInput } from 'react-native-paper';

import { useState } from 'react';

import { useNavigation } from '@react-navigation/native';

import {getDatabase,ref , set, update,onValue, remove} from "firebase/database";

import { db } from './config';

export default function Signup() {

const [name,setName]=useState("");

const [nameErr,setNameErr]=useState("");

const [psswd,setpsswd]=useState("");

const [psswdErr,setpsswdErr]=useState("");

const [mail,setmail]=useState("");

const [mailErr,setmailErr]=useState("");

const [number,setnumber]=useState("");

const [numberErr,setnumberErr]=useState("");

const navigation=useNavigation();

function storeData(){

update(ref(db,'users/'+name),{

UserName:name,

Password:psswd,

Email:mail,

Contact:number

}).then(()=>{

alert("data updated")

})

}

const onSubmit=()=>{

var nameValid=false

var psswdValid=false

var mailValid=false

var numberValid=false

if(name.length==0){

setNameErr("username required");

}

else if(/[0-9]/.test(name)){

setNameErr("Enter proper Name");

}

else{

setNameErr("");

nameValid=true;

}

if(psswd.length<6){

setpsswdErr("enter password conatining minimum 6 characters");

}

else if((/[0-9]/.test(psswd)==false) || (/[A-Z]/.test(psswd)==false) || (/[a-z]/.test(psswd)==false) ){

setpsswdErr("must be combination of digit,Ucase,Lcase");

}

else{

setpsswdErr("");

psswdValid=true;

}

if(mail.length==0){

setmailErr("email is required");

}

else if(mail.indexOf(' ')>=0){

setmailErr("cannot contain spaces");

}

else if(mail.includes('@gmail.com')==false){

setmailErr("Enter proper Email");

}

else{

setmailErr("");

mailValid=true;

}

if(number.length!=10){

setnumberErr("enter proper number");

}

else{

setnumberErr("");

storeData();

numberValid=true;

}

if(nameValid && psswdValid && mailValid && numberValid){

navigation.navigate("Login");

}

}

return (

<View style={styles.container}>

<Text>Create your Account</Text>

<TextInput style={styles.btn}label="Username" left={<TextInput.Icon icon="account"/>}

onChangeText={value=>setName(value)}

/>

<Text>{nameErr}</Text>

<TextInput style={styles.btn}label="password" left={<TextInput.Icon icon="form-textbox-password"/>}

onChangeText={value=>setpsswd(value)}

/>

<Text>{psswdErr}</Text>

<TextInput style={styles.btn}label="Phone" left={<TextInput.Icon icon="phone"/>}

onChangeText={value=>setnumber(value)}

keyboardType="numeric"

/>

<Text>{numberErr}</Text>

<TextInput style={styles.btn}label="Email" left={<TextInput.Icon icon="mail"/>}

onChangeText={value=>setmail(value)}

/>

<Text>{mailErr}</Text>

<Button style={styles.btn} title="Submit" onPress={onSubmit}></Button>

</View>

);

}

const styles = StyleSheet.create({

container: {

flex: 1,

backgroundColor: '#fff',

alignItems: 'center',

justifyContent: 'center',

},

btn:{

backgroundColor:"#fff",

margin:10,

height:60,

width:330,

marginBottom : 5,

borderWidth: 1,

borderRadius: 10,

padding: 5

}

});

**Login Page:**

import { StyleSheet, Text, View,Button } from 'react-native';

import { TextInput } from 'react-native-paper';

import { useState } from 'react';

import { useNavigation } from '@react-navigation/native';

export default function Login() {

const [number,setnumber]=useState("");

const [numberErr,setnumberErr]=useState("");

const [psswd,setpsswd]=useState("");

const [psswdErr,setpsswdErr]=useState("");

const navigation=useNavigation();

const onSubmit=()=>{

var numberValid=false

var psswdValid=false

if(number.length!=10){

setnumberErr("enter proper number");

}

else{

setnumberErr("");

numberValid=true;

}

if(psswd.length<6){

setpsswdErr("enter password conatining minimum 6 characters");

}

else if((/[0-9]/.test(psswd)==false) || (/[A-Z]/.test(psswd)==false) || (/[a-z]/.test(psswd)==false) ){

setpsswdErr("must be combination of digit,Ucase,Lcase");

}

else{

setpsswdErr("");

psswdValid=true;

}

if(numberValid && psswdValid ){

navigation.navigate("Home")

}

}

return (

<View style={styles.container}>

<Text>LOGIN</Text>

<TextInput style={styles.btn}label="Phone" left={<TextInput.Icon icon="phone"/>}

onChangeText={value=>setnumber(value)}

keyboardType="numeric"/>

<Text>{numberErr}</Text>

<TextInput style={styles.btn}label="password" left={<TextInput.Icon icon="form-textbox-password"/>}

onChangeText={value=>setpsswd(value)}/>

<Text>{psswdErr}</Text>

<Button style={styles.btn} title="Submit" onPress={onSubmit}></Button>

</View>

);

}

const styles = StyleSheet.create({

container: {

flex: 1,

backgroundColor: '#fff',

alignItems: 'center',

justifyContent: 'center',

},

btn:{

backgroundColor:"#fff",

margin:10,

height:60,

width:300,

marginBottom : 10,

borderWidth: 1,

borderRadius: 10,

padding: 5

}

});

**Controlling Panel:**

import React from 'react';

import { StyleSheet,Text,View,Button,TouchableOpacity } from "react-native";

export default function Robot(){

return(

<View style={styles.container}>

<View >

<TouchableOpacity style={styles.button}>

<Text style={styles.des}>UP</Text>

</TouchableOpacity>

<TouchableOpacity style={styles.bttn}>

<Text style={styles.des}>ROBOT</Text>

</TouchableOpacity>

<TouchableOpacity style={styles.button}>

<Text style={styles.des}>DOWN</Text>

</TouchableOpacity>

</View>

<View style={styles.rtn} >

<TouchableOpacity style={styles.side}>

<Text style={styles.desl}>LEFT</Text>

</TouchableOpacity>

<TouchableOpacity style={styles.side}>

<Text style={styles.desr}>RIGHT</Text>

</TouchableOpacity>

</View>

<View>

<TouchableOpacity style={styles.button}>

<Text style={styles.des}>ON</Text>

</TouchableOpacity>

</View>

<View>

<TouchableOpacity style={styles.button}>

<Text style={styles.des}>OFF</Text>

</TouchableOpacity>

</View>

</View>

)

}

const styles = StyleSheet.create({

container:{

flex: 1,

justifyContent: 'center',

margin: 16,

backgroundColor:'#fff',

alignItems:'center',

// justifyContent:'center'

},

rtn:{

flexDirection:'row',

//justifyContent: 'space-between',

},

button: {

alignItems: 'center',

justifyContent:"center",

backgroundColor: '#DDDDDD',

padding: 10,

width:130,

height:60,

margin:50,

borderRadius:10,

},

bttn:{

alignItems: 'center',

justifyContent:"center",

backgroundColor: '#DDDDDD',

padding: 10,

width:130,

height:100,

margin:50,

marginTop:-35,

marginBottom:-35,

borderRadius:20,

},

side:{

alignItems: 'center',

justifyContent:"space-evenly",

backgroundColor: '#DDDDDD',

padding: 10,

width:60,

height:100,

margin:80,

marginTop:-225,

borderRadius:10,

},

des:{

fontSize:18,

},

desl:{

fontSize:15,

transform:[{ rotate:'90deg'}]

},

desr:{

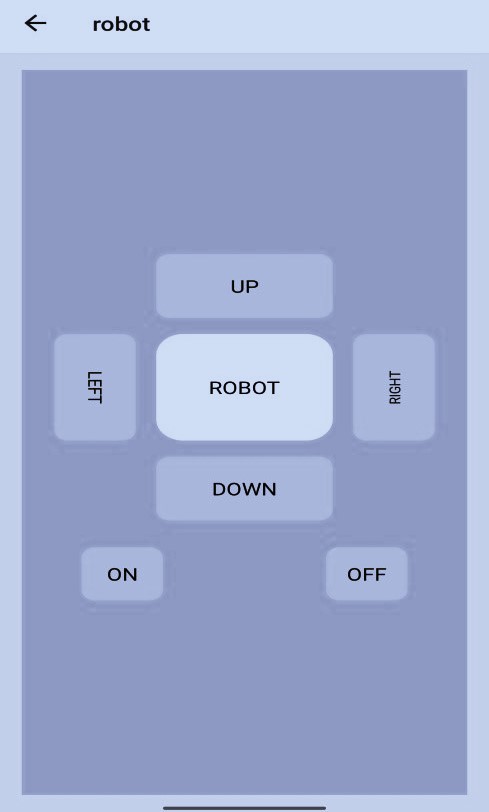
fontSize:12,

transform:[{ rotate:'270deg'}]

}

})

1. **Findings / Results of Analysis**



1. **Conclusions:**

In conclusion, the Room Light Controlling App project is a practical and innovative solution for controlling the lighting system in a room using a mobile application. The project incorporates a microcontroller-based circuit, a communication module, and a mobile application development platform to provide a comprehensive solution for users to control the lighting system in their rooms.

The project's primary objective is to provide an easy-to-use interface that allows users to control the brightness and color of the room's lighting system. Additionally, the project enables users to set schedules and control the lighting system from their mobile devices, providing an added layer of convenience and flexibility.

The project has identified various modules, including the user interface, microcontroller, communication, scheduler, database, debugging and testing, and documentation, that are crucial to its successful implementation.

The project's technology stack includes a microcontroller, Bluetooth or Wi-Fi module, Android Studio, programming languages, and SQLite database management system. These technologies work together to provide a reliable and functional solution for controlling the lighting system in a room using a mobile application.

Overall, the Room Light Controlling App project is a practical and innovative solution that has the potential to improve the user experience and provide added convenience and flexibility for controlling the lighting system in a room.

1. **Future Enhancements**

There are several potential future enhancements for the Room Light Controlling App project, which could improve its functionality, usability, and performance. Some of the potential future enhancements for the project include:

Voice Control: Adding voice control functionality to the app would allow users to control the lighting system in their rooms using voice commands. This would add an extra layer of convenience and accessibility for users.

Geo-location Integration: Integrating the app with geo-location technology would allow users to set up location-based lighting schedules. For example, users could set up the app to turn on the lights in their home as they approach their driveway, ensuring that their home is well-lit and welcoming.

Integration with Other Smart Home Devices: Integrating the app with other smart home devices, such as smart speakers, smart locks, and smart thermostats, would enable users to create more advanced home automation routines.

Integration with Cloud-based Services: Integrating the app with cloud-based services would enable users to control the lighting system in their rooms remotely, even when they are not at home. This would add an extra layer of security and convenience for users.

Machine Learning-Based Lighting Control: Implementing machine learning algorithms into the app would enable it to learn users' preferences and automatically adjust the lighting system based on their preferences and behavior.

These are just a few examples of potential future enhancements for the Room Light Controlling App project. As technology continues to advance, there will likely be many more opportunities to improve and expand the functionality of the app.

1. **References:**
2. "Arduino: A Technical Reference" by J. M. Hughes
3. "Wireless Communications Principles and Practice" by Theodore S. Rappaport
4. "Designing for the Internet of Things" by Adrian McEwen and Hakim Cassimally
5. "Embedded Systems: Introduction to Arm Cortex-M Microcontrollers" by Jonathan W. Valvano
6. "Programming the Raspberry Pi, Second Edition: Getting Started with Python" by Simon Monk
7. "Building Wireless Sensor Networks: with ZigBee, XBee, Arduino, and Processing" by Robert Faludi
8. https://techatronic.com/phone-control-light-using-arduino-control-lights-with-smartphone/
9. https://joyofandroid.com/app-controlled-lights/