Project Report for Home Automation and Security System

Computer Science Engineering Part of The Design Project

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INTRODUCTION

Home Automation is building automation for a home, called a smart home or smart house.

Here we are going to make automation in RETRO MODE. A home automation system will control lighting, climate, entertainment systems, and appliances. In our project, we are going to control lighting and anything which can be controlled by the switch.

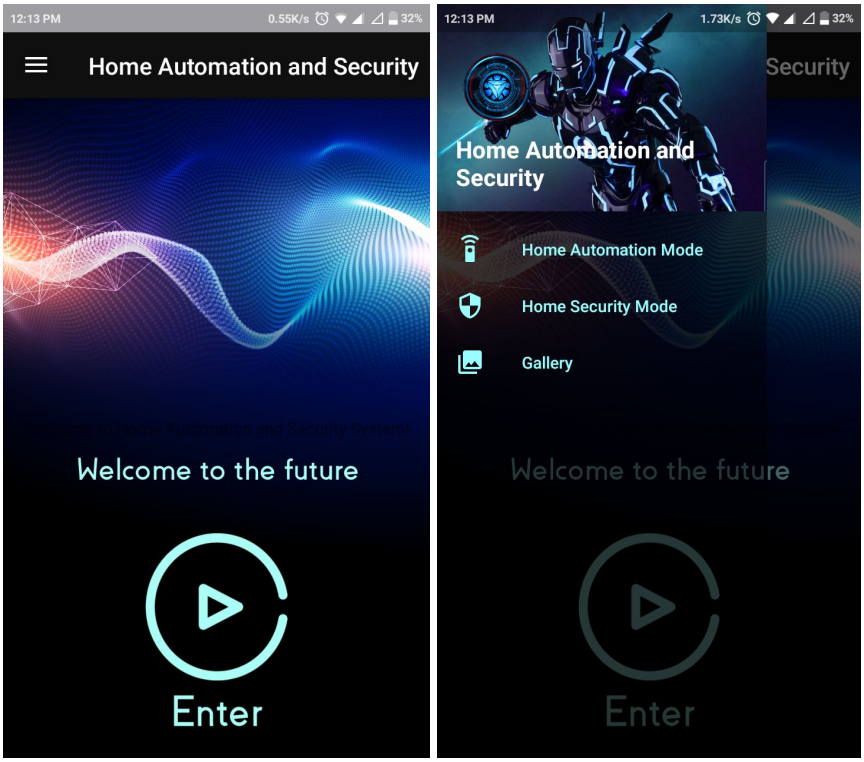
It may also include home security such as access control and alarm systems. So we are going to build up mechanisms for both control lighting and security.

Here we are having two different circuits to perform two tasks (Home Automation and Security). In Home Automation, we are having Bluetooth module attached to our Arduino which is responsible for triggering the mechanical switch through mobile. This Bluetooth module takes the different type of signal and then give those signals to a microcontroller for computing. After getting digital signals, the microcontroller(Arduino) process the information and then it gives commands to motors to make the electronic switch in state ON/OFF.

In Home Security we connect a switch inside door well. When anyone presses the doorbell, the button is also get pressed and accordingly it triggers the microcontroller to send the notification to the owner of that house by using Bluetooth module. Here a physical interface model is also connected to this device which is having a camera attached on it. So when someone presses this device's button, it makes this camera attached on physical interface model to ON state and sent pics to user’s mobile using Bluetooth module. It will automatically stop after 10 seconds. The user can also make a trigger by giving a control signal by the mobile application which will be received by the device through the Bluetooth module. In Home Security, we are having a proximity sensor which is detecting whether a window is open or not and sending information to the mobile application by Bluetooth module.

Welcome to Home Automation and security system, We want to design an app by which we can control our home automation and security system.

HOMEPAGE



This is the homepage of our Home Automation and Security App. It has one button named “Enter”. This button redirects us to Homepage_2 activity, to select the mode which we want to Enter. It has a navigator which has three options: Home Automation Mode, Security Mode and Gallery. Home Automation Mode will directly redirect us to the Automation Mode. Home Security Mode will directly redirect us to the Home Security Mode. Gallery Mode will redirect us to the Gallery which contains the saved images by the camera of the Home Security Mode.

The files associated with it are as follows:

Homepage.kt

Activity_home_page.xml

App_bar_home_page.xml

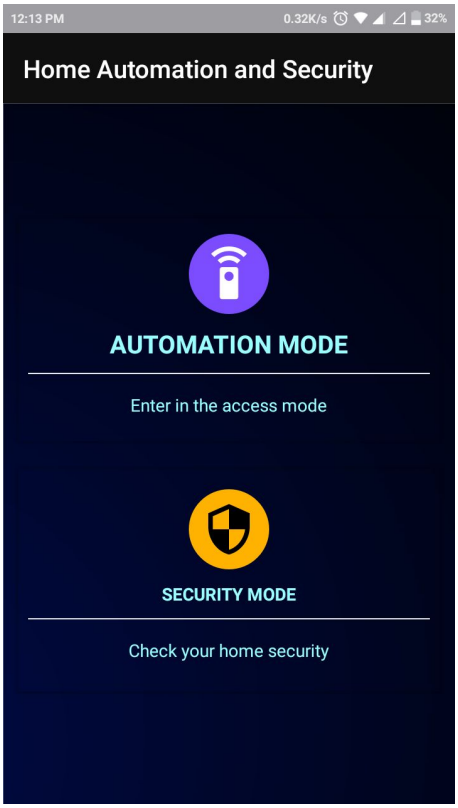
Content_home_page.xml

Nav_header_home_page.xml

Activity_home_page_drawer.xml

You can see all the following files in source code of the app.

HOMEPAGE_2



This is the home page 2 which has two different modes as our Project has two different modes, such as "Automation Mode" and "Security Mode". By selecting the Automation Mode Card, we will be redirected to the Automation Mode Activity. And by selecting Security Mode Card, we will be redirected to the Security Mode Activity.

Serial Number	Name of Element	Working
1	**Automation Mode CardView**	This is a card which will redirect us to the access mode activity, through which we can control the switches of our home.

2	**Security Mode CardView**	This is the button which will redirect us to the security mode activity, through which we can control our security device.

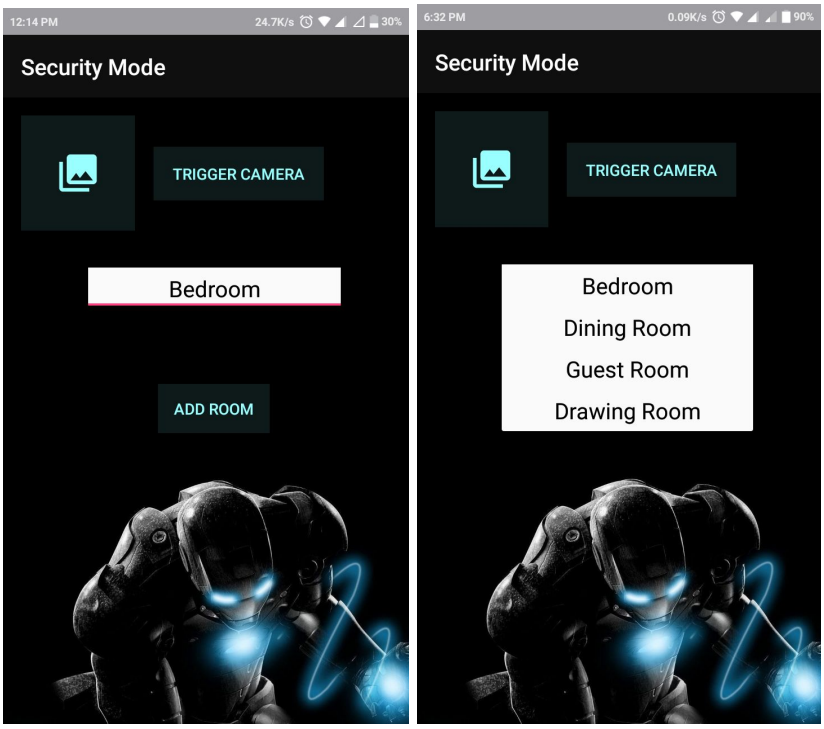
The files associated with it are as follows:

Homepage2.kt

Activity_homepage2.xml

You can see all the following files in source code of the app.

SECURITY MODE



Serial Number	Name of Element	Working
1	**Gallery Button**	This button is used to view all previously saved pictures taken by our device's camera.
2	**Trigger camera Button**	This button is used to manually trigger the camera so that it can take a picture and save it to our phone's gallery. It also includes a voice interactive system, as when we click it, it will speak “Security Mode is now opening”.
3	**Add Room Button**	This button is used to add

		the room to the database where the proximity sensor is used such as in windows, doors etc. to track whether it is open or closed.
4	**ComboBox**	* Dining Room * Drawing Room * Bed Room * Main Door This dropdown is used to select the room which we want to track whether it is open or closed.

The files associated with it are as follows:

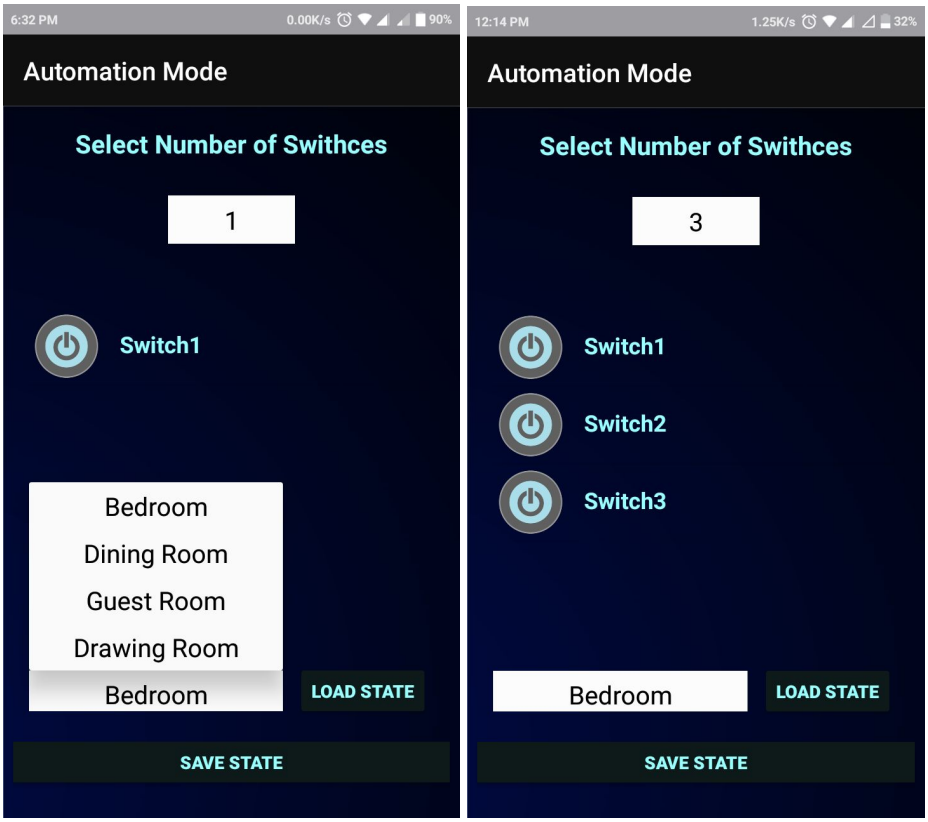
SecurityMode.kt

Activity_security_mode.xml

spinner_item.xml

You can see all the following files in source code of the app.

AUTOMATION MODE



Serial Number	Name of Element	Working
1	**Number of Switches ComboBox**	This is a dropdown through which we can select a number of switches which we want to control through the device. It has four values 1, 2, 3, 4. The maximum switches which can be controlled by a single device will be 4. The switches will be added dynamically to the database in the table named switches which will have two columns named, ID and Switch name.

2	**Combobox**	This is used to select the previous saved state or configuration. This will be loaded from the database from a table named State which will have two columns ID, Name like here we have (1, Bed Room), (2, Drawing Room), (3, Kitchen)
3	**Save State Button**	This is used to save the current state in the database to a table named State which will have two columns ID, Name. When this is clicked it will ask us to enter the name of the state to be saved.
4	**Load State Button**	This button is used to load the selected state in the above dropdown.
5	**Switches List View**	This is the list view which shows the number of switches which we selected. Each switch can be clicked to control the switch as it will redirect us the switch preferences activity.

The files associated with it are as follows:

AccessMode.kt

SwitchList.kt

DatabaseHandler.java

Switch.java

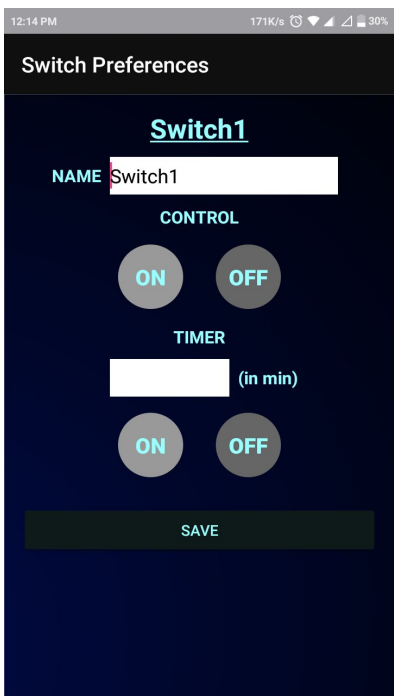
Activity_access_mode.xml

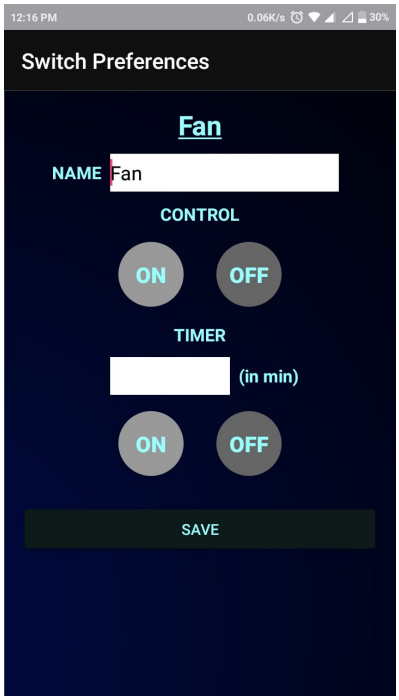
Spinner_item.xml

Activity_switch_list.xml

You can see all the following files in source code of the app.

SWITCH PREFERENCES





This State comes after providing the name to the state and clicking on save button

Serial Number	Name of Element	Working
1	**Control ON**	This an ON state of a switch. We can tap on it to make the switch ON.
2	**Control OFF**	This an OFF state of a switch. We can tap on it to make the switch OFF.
3	**Name**	This is a renamed field through which we can rename any switch, such as the first switch is renamed as Fan.
4	**Timer**	This is a timer field through which we can set the timer for a switch i.e. to Switch Fan OFF after 15 minutes.
5	**Timer ON**	This an ON state of a switch which will be clicked after we have set the timer field to schedule a switch to ON after that particular minutes.
6	**Timer OFF**	This an OFF state of a switch which will be clicked after we have set the timer field to schedule a switch to OFF after that particular minutes.
7	**Save**	This is used to save the changed name to the database.

The files associated with it are as follows:

AccessSwitchPage.kt

DatabaseHandler.java

Switch.java

Activity_access_switch_page.xml

spinner_item.xml

You can see all the following files in source code of the app.