Vidyalankar Institute of Technology www.vit.edu.in	**Department of First Year Engineering 2017-18** **Applied Chemistry II-PBL report** **Nilima Main**

TITLE OF THE PROJECT	WIFI HOME AUTOMATION
1. Name of Students:	YOGESH MISHRA VIBHUTI GAWAND SADHVI PUGAONKAR SHIVAKRISHNA DASARI PREETAM RANE
2. Roll Numbers:	17104A0028 17104A0030 17104A0040 17104A0047 17104A0050
3. Name of Subject teacher:	Prof. Nilima Main
4. Signature of Subject teacher:	
5 Grading:	
6 Comments:	

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Objective:

- To introduce a new approach to problem-based learning (PBL) used in Applied chemistry practical class for engineering students
- To include knowledge acquisition
- To enhance group collaboration and communication.

Problem Statement:

Have you ever run into a situation where
we forgot to turn off lights ,water pump,fan,etc. So what will you do? Go back home and turn it off!!!! So here we have a solution…..

All possible solutions: (List all solutions possible)

Travel back to home and switch off the appliances
Call neighbors and ask them to switch off the main power supply of your house

Your solution, why should we implement this solution?

Get your house over the internet and control the appliances via android app
As its quick safe and easiest way

How did you do it?

Requirements:

1. 3.3V and 5V Power Supply Module for MB102 Bread Board
2.NODEMCU-ESP8266 Wifi Development Board
3.4 Channel 5V 10A Relay Module
4.Jumpers
5.Buzzers(9V)(for testing the circuit)

Procedure: (Procedure should include diagram if any or flow sheet diagram, eg circuit diagram)

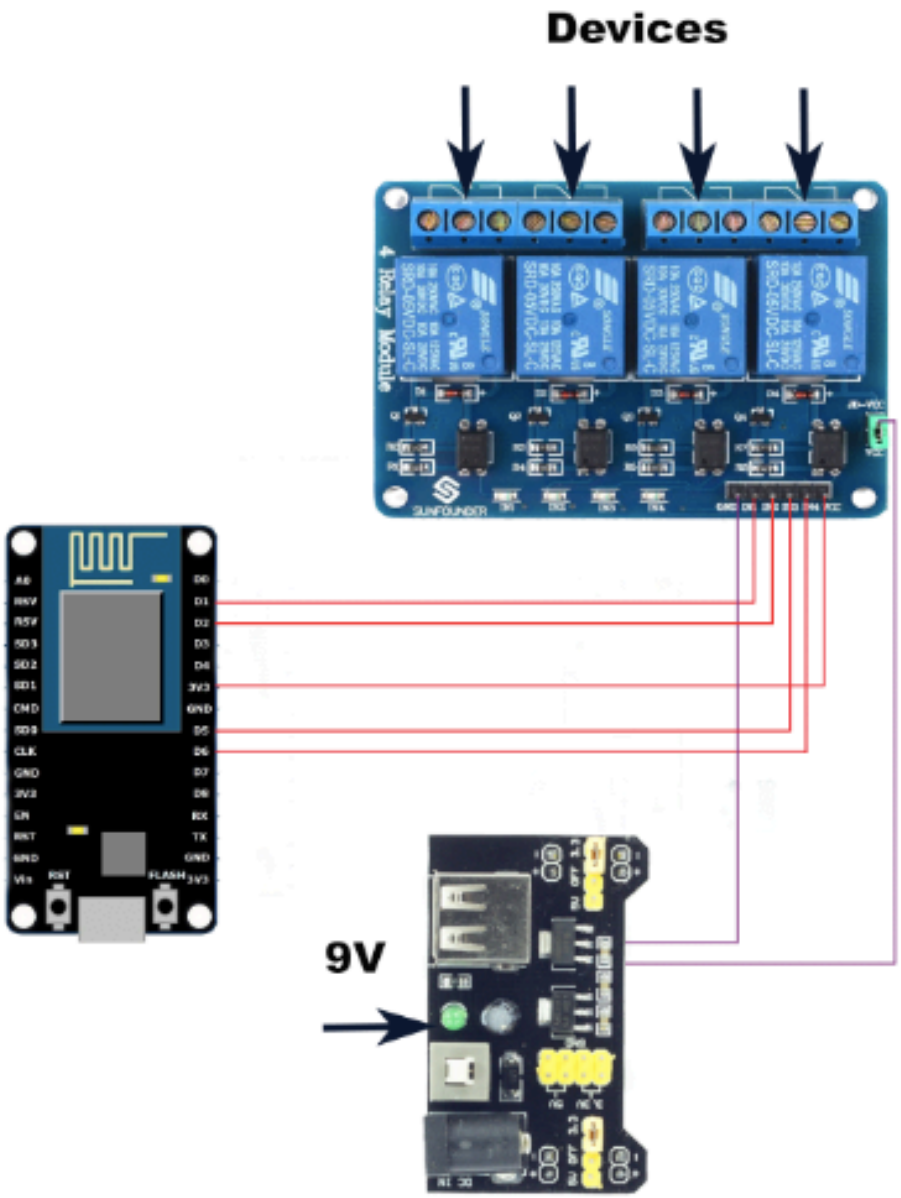
Hardware connections:

Pins-

Wifi module- D1	Relay module – IN 1
Wifi module- D2	Relay module – IN 2
Wifi module- D5	Relay module – IN 3

Wifi module- D6	Relay module – IN 4
Wifi module- 3.3v	Relay module – Vcc
MB102 bread board- 5v	Relay module – JD-vcc
MB102 bread board- GND	Relay module – JD-GND

Circuit



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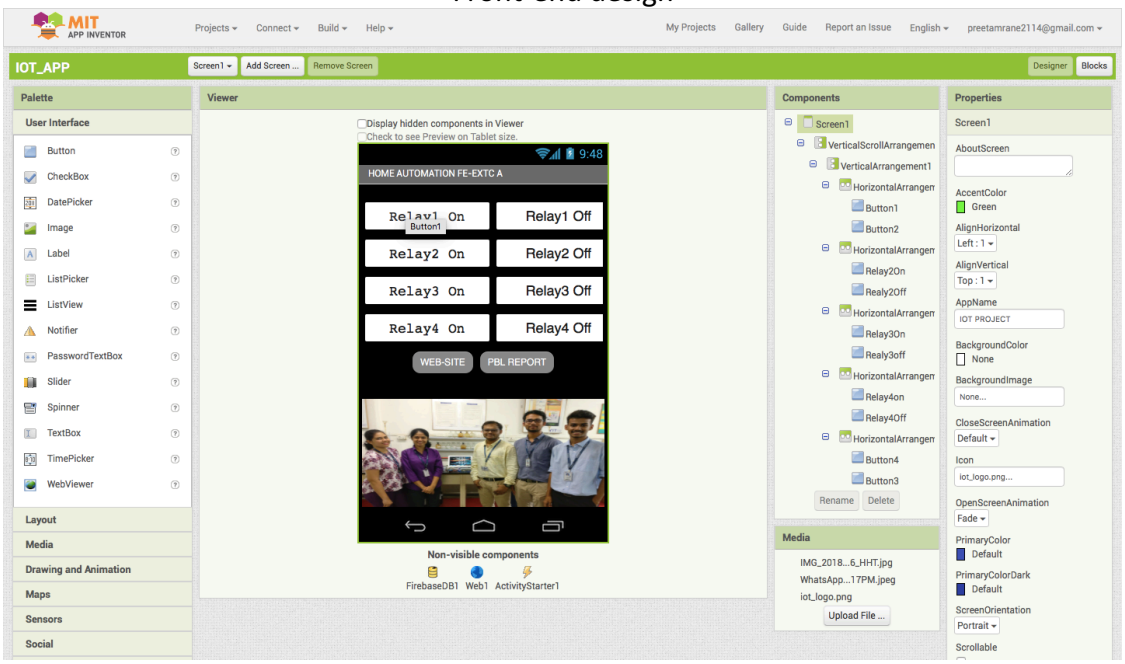
Building The app:

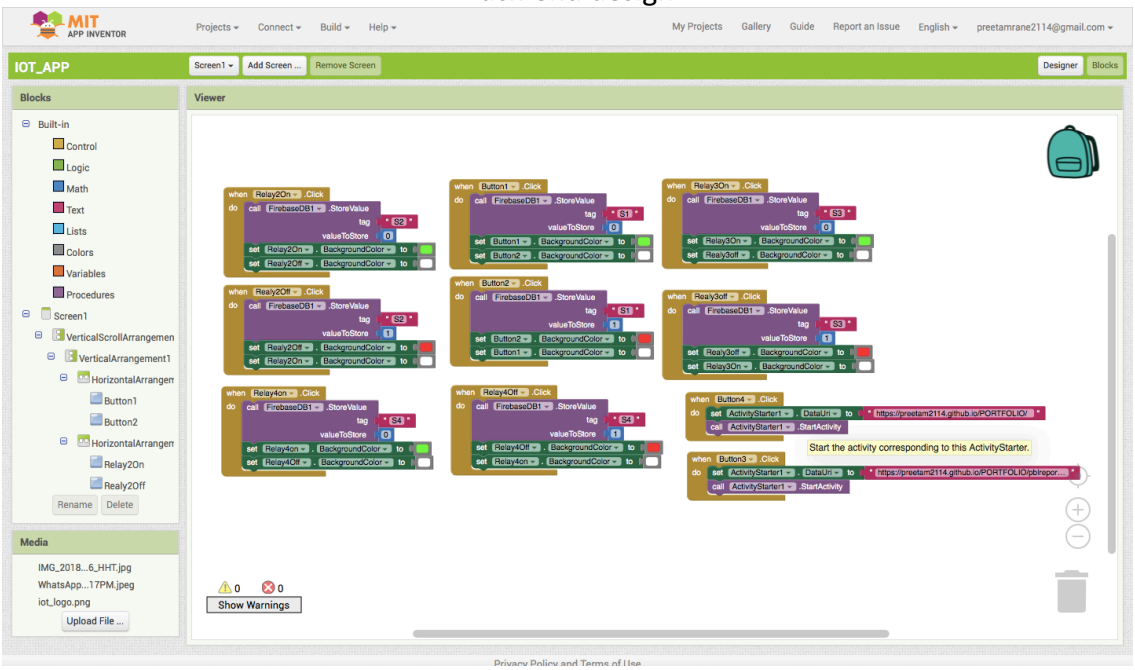
Website: **http://ai2.appinventor.mit.edu**

Guide:http://appinventor.mit.edu/explore/sites/all/files/hourofcode/AppInventorTutorials.pdf

Front-end design



Back-end design



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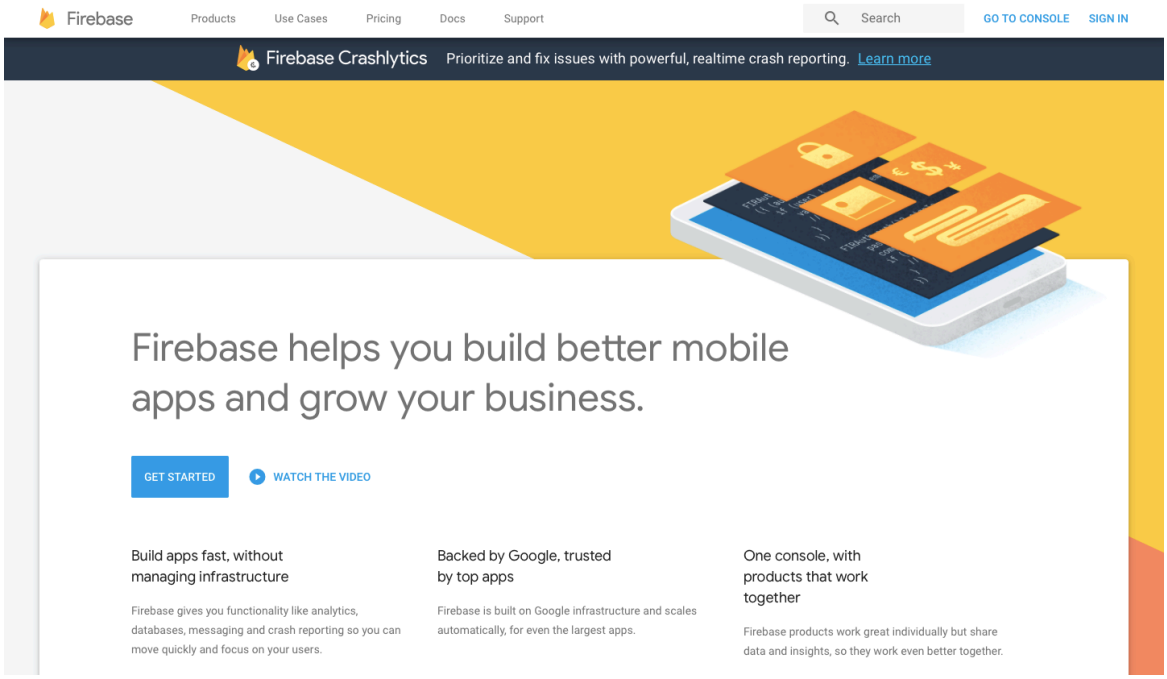
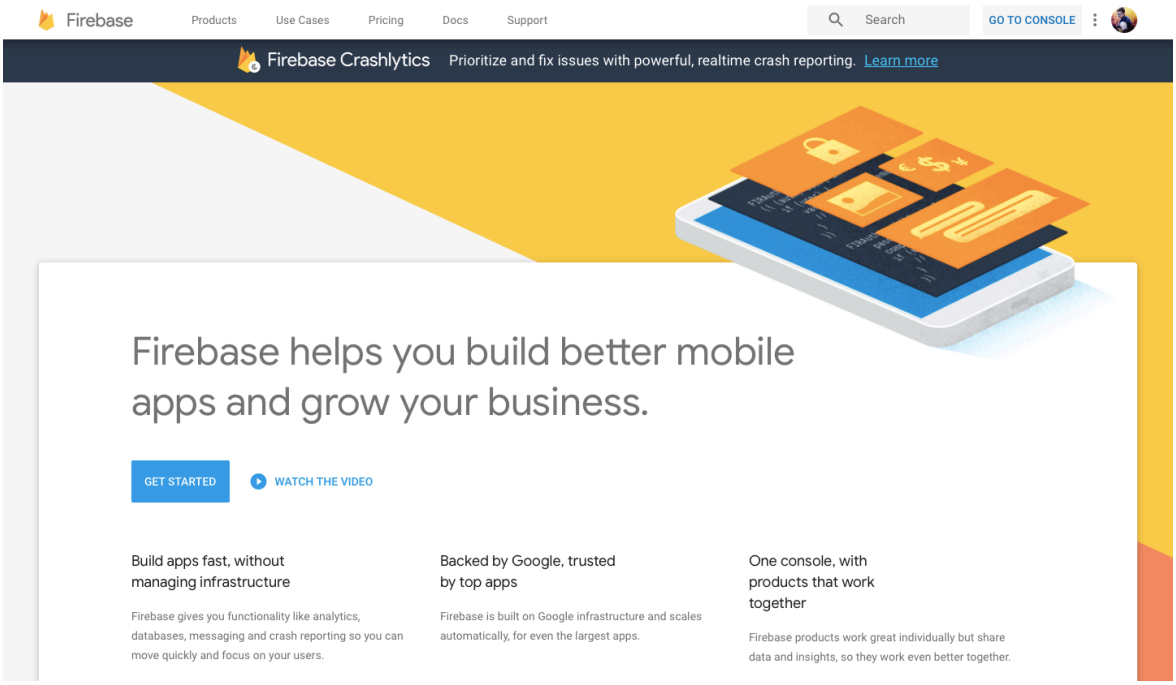
Setting the Google fire base server:

Step 1: go to https://firebase.google.com/

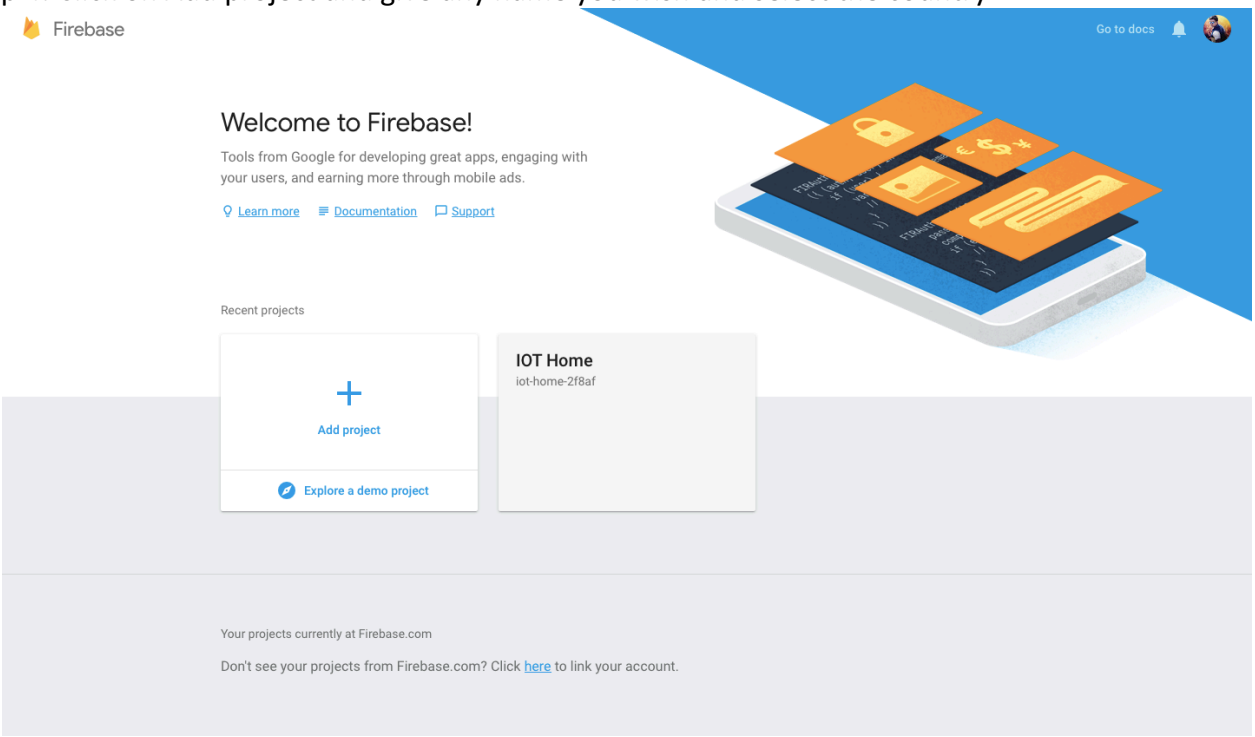


Step 2: Sign in to google account

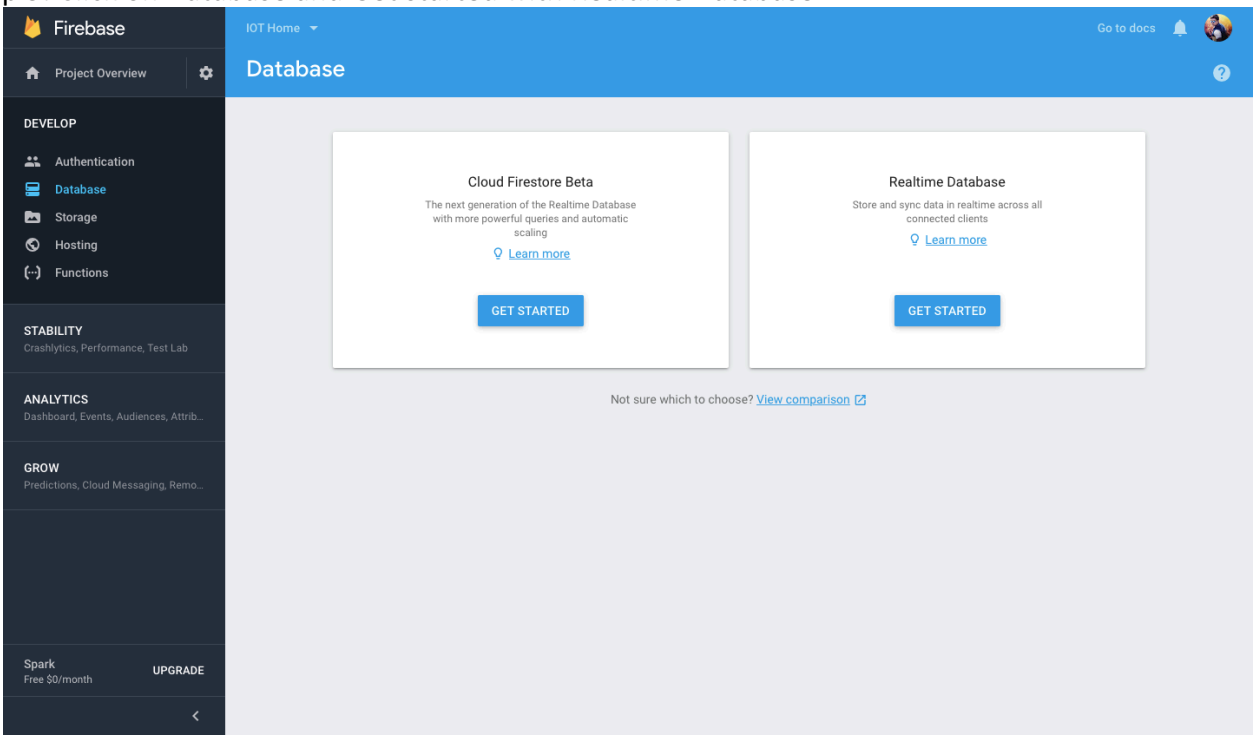


Step 3: Click go to console

Step 4: Click on Add project and give any name you wish and select the country

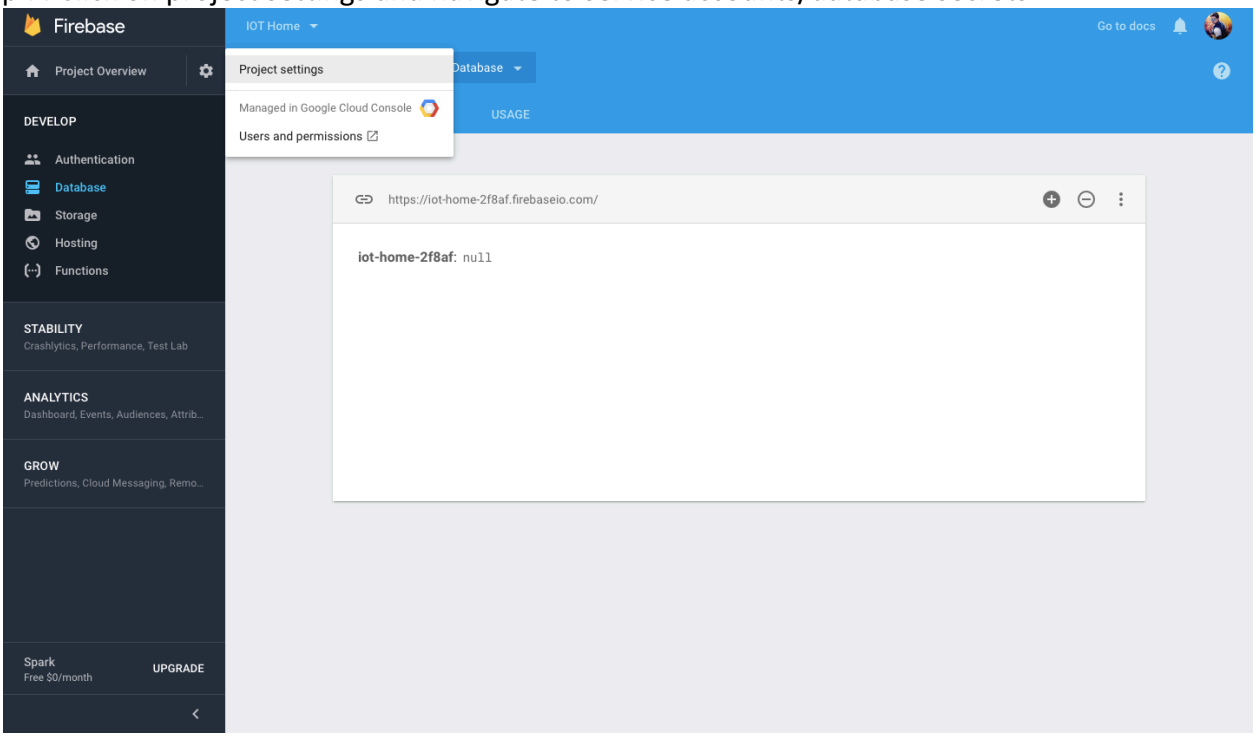


Step 5: Click on Database and Get started with Realtime Database

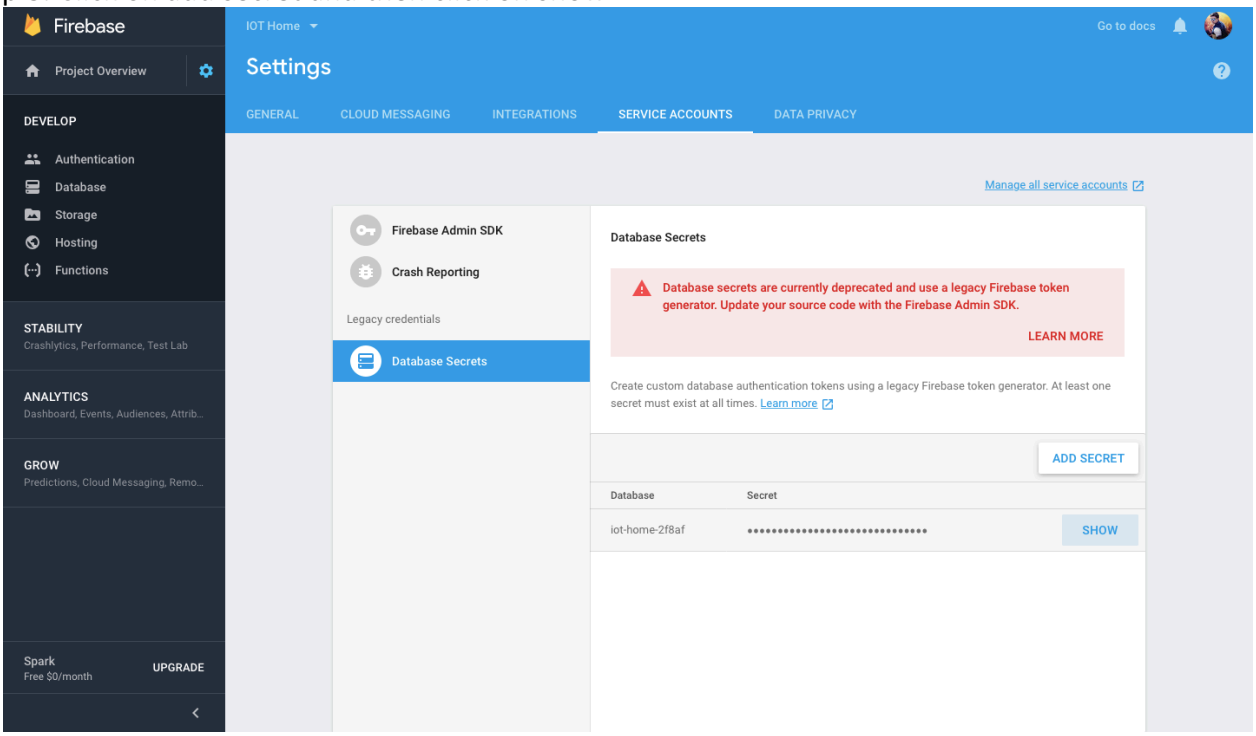


Step 6: Copy the provided Firebase web address

Step 7: Click on project settings and navigate to service accounts/database secrets



Step 8: Click on add secret and then click on show



Step 9: Copy the Firebase Secret

Code for Nodemcu Wifi development module:

```
#include <ESP8266WiFi.h>
#include<FirebaseArduino.h>
#define FIREBASE_HOST "iot-home-2f8af.firebaseio.com"                  //Your Firebase Project URL goes here without "http:" , "\" and "/"
#define FIREBASE_AUTH "**********************"       //Your Firebase Database Secret goes here
#define WIFI_SSID "pvr"                                    //your WiFi SSID for which yout NodeMCU connects
#define WIFI_PASSWORD "12345678"                             //Password of your wifi network

#define Relay1 5 //D1
int val1;

#define Relay2 4 //D2
int val2;

#define Relay3 14  //D5
int val3;

#define Relay4 12 //D6
int val4;

void setup()
{
 Serial.begin(115200);                                  // Select the same baud rate if you want to see the datas on Serial Monitor
 pinMode(Relay1,OUTPUT);
 pinMode(Relay2,OUTPUT);
 pinMode(Relay3,OUTPUT);
 pinMode(Relay4,OUTPUT);

 digitalWrite(Relay1,HIGH);
 digitalWrite(Relay2,HIGH);
 digitalWrite(Relay3,HIGH);
 digitalWrite(Relay4,HIGH);

 WiFi.begin(WIFI_SSID,WIFI_PASSWORD);
 Serial.print("connecting");
 while (WiFi.status()!=WL_CONNECTED){
  Serial.print(".");
  delay(500);
 }
 Serial.println();
 Serial.print("connected:");
 Serial.println(WiFi.localIP());

 Firebase.begin(FIREBASE_HOST,FIREBASE_AUTH);
 Firebase.setInt("S1",0);                //Here the varialbe"S1","S2","S3" and "S4" needs to be the one which is used in our Firebase and MIT App
Inventor
 Firebase.setInt("S2",0);
 Firebase.setInt("S3",0);
 Firebase.setInt("S4",0);

}
void firebasereconnect()
{
 Serial.println("Trying to reconnect");
  Firebase.begin(FIREBASE_HOST, FIREBASE_AUTH);
 }

void loop()
{
 if (Firebase.failed())
```

```
    {
    Serial.print("setting number failed:");
    Serial.println(Firebase.error());
    firebasereconnect();
    return;
    }
  val1=Firebase.getString("S1").toInt();                    //Reading the value of the varialble Status from the firebase

  if(val1==1)                                   // If, the Status is 1, turn on the Relay1
    {
    digitalWrite(Relay1,LOW);
    Serial.println("light 1 ON");
   }
   else if(val1==0)                               // If, the Status is 0, turn Off the Relay1
   {
    digitalWrite(Relay1,HIGH);
    Serial.println("light 1 OFF");
   }

  val2=Firebase.getString("S2").toInt();                    //Reading the value of the varialble Status from the firebase

  if(val2==1)                                   // If, the Status is 1, turn on the Relay2
    {
    digitalWrite(Relay2,LOW);
    Serial.println("light 2 ON");
   }
   else if(val2==0)                               // If, the Status is 0, turn Off the Relay2
   {
    digitalWrite(Relay2,HIGH);
    Serial.println("light 2 OFF");
   }

   val3=Firebase.getString("S3").toInt();                    //Reading the value of the varialble Status from the firebase

  if(val3==1)                                   // If, the Status is 1, turn on the Relay3
    {
    digitalWrite(Relay3,LOW);
    Serial.println("light 3 ON");
   }
   else if(val3==0)                               // If, the Status is 0, turn Off the Relay3
   {
    digitalWrite(Relay3,HIGH);
    Serial.println("light 3 OFF");
   }

   val4=Firebase.getString("S4").toInt();                    //Reading the value of the varialble Status from the firebase

  if(val4==1)                                   // If, the Status is 1, turn on the Relay4
    {
    digitalWrite(Relay4,LOW);
    Serial.println("light 4 ON");
   }
   else if(val4==0)                               // If, the Status is 0, turn Off the Relay4
   {
    digitalWrite(Relay4,HIGH);
    Serial.println("light 4 OFF");
   }
}
```

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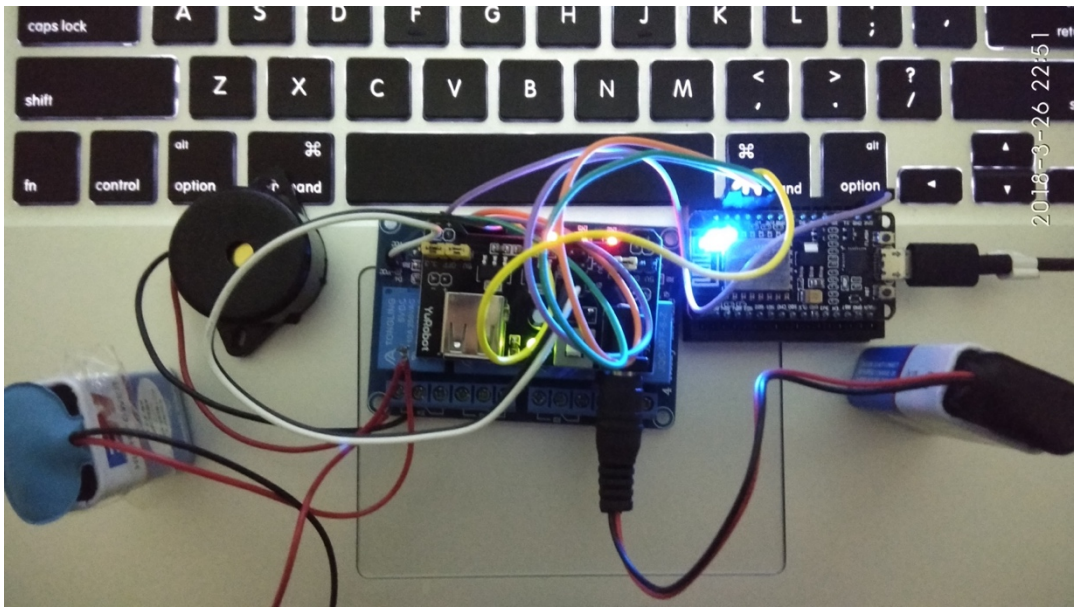
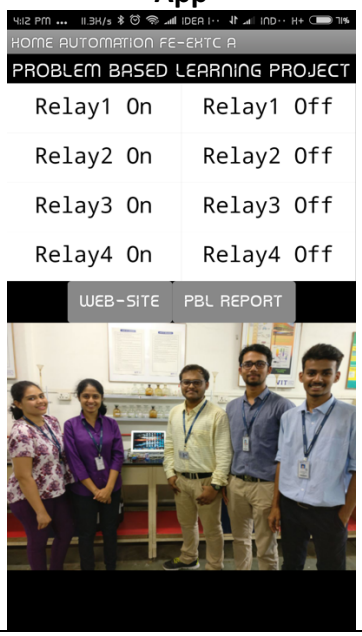
Observations:

1.Google firebase provides a fast real-time database for projects
2.Project provides a convenient way to control home appliances
3.The app is user friendly and has every stuff prebuilt for ease of use

Image of Final model:



App



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Large scale Applications:

It can also be used to control remotely located industrial machines depending upon the hardware

Conclusion/ Takeaway:

IOT really provides a great way to ease life and help to save time

Detailed Cost of project:

Wi-fi Module: Rs.350
Relay Module: Rs.200
3.3V and 5V Power Supply Module for MB102 Bread Board: Rs.180

Estimated time to complete:

3 weeks

Allied study:

Learned about to build android apps
Control appliances over the internet through real-time database
Learned about various various electronic components
Learned to program over the Arduino ide and using its various tools

References:

http://appinventor.mit.edu/explore/sites/all/files/hourofcode/AppInventorTutorials.pdf
https://github.com/Preetam2114/Chemistry-PBL
https://preetam2114.github.io/PORTFOLIO/

Problems faced:

Circuit got damaged due to improper connection while first trial

Future prospects if any:

1. The Home automation market was worth US $5.77 billion in 2013, predicted to reach a market value of US $12.81 billion by year 2020.
2. In future, robots will be accounted to control such e-gadgets at home.
3. Big companies like Philips, Siemens and Schneider will eventually bring out fairly mass market automation products with appealing user interface but at a lower price point than today ,and more people will be able to afford the products.
4. Users will be able to buy and use the automation products themselves without the aid of any technical expert.

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