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| **TITLE OF THE PROJECT** | WIFI HOME AUTOMATION |
| 1. **Name of Students:** | YOGESH MISHRA  VIBHUTI GAWAND SADHVI PUGAONKAR SHIVAKRISHNA DASARI PREETAM RANE |
| 1. **Roll Numbers:** | 17104A0028  17104A0030  17104A0040  17104A0047  17104A0050 |
| 1. **Name of Subject teacher:** | Prof. Nilima Main |
| 1. **Signature of Subject teacher:** |  |
| 1. **Grading:** |  |
| 1. **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  ../Desktop/Screen%20Shot%202018-04-20%20at%202.17.00%20PM.png  ***Building The app:***  Website: [**http://ai2.appinventor.mit.edu**](http://ai2.appinventor.mit.edu)  Guide:<http://appinventor.mit.edu/explore/sites/all/files/hourofcode/AppInventorTutorials.pdf>  Front-end design  ../Desktop/Screen%20Shot%202018-04-20%20at%202.24.04%20PM.png  Back-end design  ../Desktop/Screen%20Shot%202018-04-20%20at%202.26.49%20PM.png  ***Setting the Google fire base server:***  Step 1: go to <https://firebase.google.com/>  ../Desktop/Screen%20Shot%202018-04-20%20at%202.50.52%20PM.png  Step 2: Sign in to google account  ../Desktop/Screen%20Shot%202018-04-20%20at%202.52.09%20PM.png  Step 3: Click go to console  Step 4: Click on Add project and give any name you wish and select the country  ../Desktop/Screen%20Shot%202018-04-20%20at%202.55.07%20PM.png  Step 5: Click on Database and Get started with Realtime Database  ../Desktop/Screen%20Shot%202018-04-20%20at%202.56.53%20PM.png  Step 6: Copy the provided Firebase web address  Step 7: Click on project settings and navigate to service accounts/database secrets  ../Desktop/Screen%20Shot%202018-04-20%20at%202.58.18%20PM.png  Step 8: Click on add secret and then click on show  ../Desktop/Screen%20Shot%202018-04-20%20at%202.59.42%20PM.png  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");  }  } |
| **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:**  **../Downloads/IMG_20180326_225146_HHT.jpg**  **App**  **../Downloads/Screenshot_2018-04-20-16-12-36-634_appinventor.ai_preetamrane2114.IOT_APP.png** |
| **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. |