Name of Student:_____

Enrolment No.:_____

Class:_____

Section:_____

Session:_____

IOT Lab

[EC-705]Manual

LAKSHMI NARAIN COLLEGE OF TECHNOLOGY EXCELLENCE

Kalchuri Nagar, Raisen Road Bhopal

&

LAKSHMI NARAIN COLLEGE OF TECHNOLOGY EXCELLENCE, BHOPAL

Vision and Mission of the Department

Vision

To become reputed in providing technical education in the field of electronics and communication engineering and produce technocrats working as leaders.

Mission

1. **To provide congenial academic environment and adopting innovative learning process.**

2. **To keep valuing human values and transparency while nurturing the young engineers.**

3. **To strengthen the department by collaborating with industry and research organization of repute.**

4. **To facilitate the students to work in interdisciplinary environment and enhance their skills for employability and entrepreneurship.**

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Program Specific Outcomes (PSO's)

PSO1: Analyze specific engineering problems relevant to Electronics & Communication Engineering by applying the knowledge of basic sciences, engineering mathematics and engineering fundamentals.

PSO2: Apply and transfer interdisciplinary systems and engineering approaches to the various areas, like Communications, Signal processing, VLSI and Embedded system, PCB Designing.

PSO3: Inculcate the knowledge of Engineering and Management principles to meet demands of industry and provide solutions to the current real time problems.

PSO4: Demonstrate the leadership qualities and strive for the betterment of organization, environment and society.

Program Educational Objectives(PEO's)

PEO1: Recognize and apply appropriate experimental and scientific skills to solve real world problems to create innovative products and systems in the field of electronics and communication engineering.

PEO2: To evolve graduates with ability to apply, analyze, design in Electronics & Communication Systems.

PEO3: Motivate graduates to become responsible citizens with moral & ethical values for the welfare of Society.

PEO4: Inculcate the habit of team work with professional quality of leadership to become successful contributors in industry and/ or entrepreneurship in view of Global & National status of technology.

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Course: IOT(EC705)

Course Outcomes(CO's)
CO1.Implement the concept of IOT. CO2.Implement interfacing of various sensors with Arduino/Raspberry Pi. CO3.Analyze the ability to transmit data wirelessly b/w different devices. CO4Verify the upload/download sensor data on cloud and server. CO5.Examine various SQL queries from MySQL database.

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Code of Conducts for the Laboratory

- All bags must beleftat the indicated place.
- The lab time table must be strictly followed.
- Be **PUNCTUAL** for your laboratory session.
- Noise must be kept to a minimum.
- Work space must be kept clean and tidy at all time.
- Handle the experiment kit and interfacing its with care.
- All students are liable for any damage to the accessories due to their own negligence.
- Students are strictly **PROHIBITED** from taking out any items from the laboratory.
- Students are **NOT** allowed to work alone in the laboratory without the Lab Supervisor
- Report immediately to the Lab Supervisor if any malfunction of the accessories, Isthere.
- Be fore leaving the lab Place the stools properly.
- Please check the laboratory notice board regularly for updates.

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Rubrics for Assessment of student performance during Experiments

Area of Direct Assessment	Poor (0-2 Marks)	Fair (3-4 Marks)	Average (5-6 Marks)	Good (7-8 Marks)	Excellent (9-10 Marks)
Aim & Theory	Aim is not clear and irrelevant theory written Concept was not explained.	Aim is clear and Incomplete theory written. Concept could not be explained.	Aim is clear and Theory written but is unorganized Concept is explained.	Aim is clear and Theory written properly. Concept is explained.	Aim is clear and Theory written properly. Concept is explained with neat diagrams.
Performance and Working with Others	Did not conduct the experiment and none of the member recorded the observations.	Followed few steps to conduct the experiment. But few members recorded the observations.	Followed few steps to conduct the experiment. Few members recorded the observations.	Followed step by step method to conduct the experiment. Sufficient observations recorded by all team members.	Followed step by step method to conduct the experiment. Many observations recorded by all team members.
Safety Measures	None of the team member knew safety measures and did not followed.	Team members had knowledge of safety measures and followed few of them.	Team members had fair knowledge of safety measures and followed them.	Team members were well acquainted with safety measures and followed.	Team members were well acquainted with safety measures and followed all of them.
Result and Conclusion	No data recorded. Conclusion can not be drawn.	Analysis does not follow data the data. Conclusion can not be drawn.	Analysis as recorded somewhat lacks in insight. Results is poorly recorded to make sense. Conclusion can not be drawn.	Analysis as recorded somewhat lacks in insight. But clearly recorded as Results. Conclusion is properly drawn.	Observations are analyzed accurately and clearly recorded as Results. Conclusion is properly drawn.
Observations and Calculations	No observations recorded and no calculation done.	Insufficient number of observations recorded. So calculations are Inaccurate.	Sufficient number of observations recorded but calculations are Inaccurate.	Almost all observations recorded. Calculations are accurate and well organized.	Many observations recorded in the table. Calculations are accurate and well organized.
Internal Viva	Student does not have grasp on the experiment and could not answer the questions about the experiment.	Student mumbles incorrectly, pronouns terms and speak too quietly for teachers to hear.	Student is uncomfortable but is able to answer basic questions about the experiment.	Student is at ease and able to answer expected questions, but fails to elaborate.	Student demonstrated full knowledge by answering all questions with explanations and elaboration.

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INDEX

Name of Student:_____Enrolment No.:_____

Sl. No.	Title of the Experiment	Date of Experiment	Date of Submission	Remark
1	To write a program to sense the available Network using Arduino.			
2	To write a program to measure the distance using ultrasonic sensor and make LED blink using Arduino.			
3	To write a program to detect the vibration of an object with sensor using Arduino.			
4	To write a program to connect with the Available Wi-Fi using Arduino			
5	To write a program to sense a finger when it is placed on the board Arduino.			
6	To write a program to get temperature notification using Arduino.			
7	To write a program for LDR to vary the light intensity of LED using Arduino.			
8	To write a program to install MySQL database in Raspberry pi.			

9	To write a program to work with basic MySQL queries by fetching data from database in Raspberry pi.			
10	Towriteaprogramtoswitchligh tonwhentheinputis1andswitch thelightoffwhen the input is 0 using Raspberry pi.			

Date of Experiment:_____

EXPERIMENT NO:1

AIM:

To write a program to sense the available networks using Arduino.

Practical Objectives:

1. Sense the available networks using Arduino.

COMPONENTS REQUIRED:

1. WiFiModuleorESP8266Module.
2. Connecting cable or USB cable.

ALGORITHM:

STEP1: Start the process.

STEP2: Start ->Arduino IDE -1.8.8

STEP3:ThenenterthecodinginArduinoSoftware.STEP4:Compile the coding in Arduino Software.

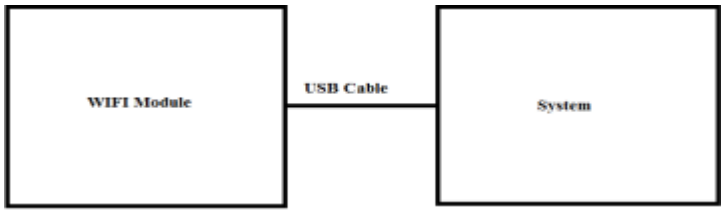
STEP5:ConnecttheUSBcabletoWiFimodule.

STEP6: Select tools -> select board -> Module node Mch.0.9CE ESP 1.2 modules -> select port.

STEP7:UploadthecodinginESPModulenodeMch.0.9CEandopenserialmonitor to view the available networks.

STEP8: Stop the process.

BLOCK MODULE:

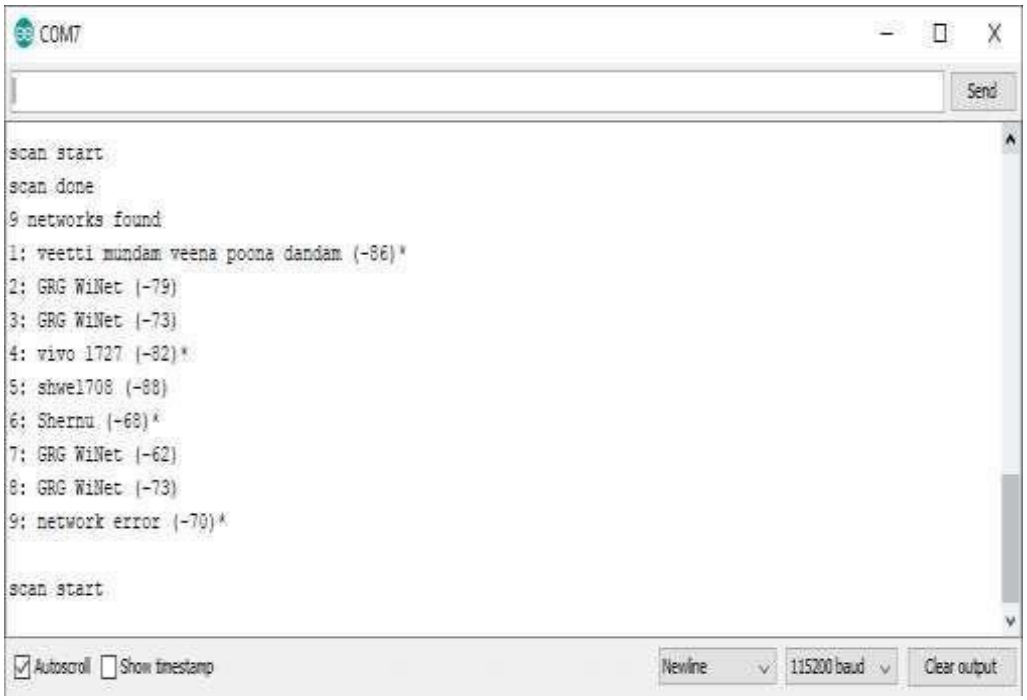


CODING:

```
#include<ESP8266WiFi.h>voidsetup() {
Serial.begin(115200);WiFi.mode(WIFI_ST
A);WiFi.disconnect();
delay(100);Serial.println("Setup done");
}
void loop() { Serial.println("scanstart"); int
n
=WiFi.scanNetworks();Serial.println("scan
                        done"); if(n == 0) {
Serial.println("no networks found");
} else {Serial.print(n);
Serial.println(" networks found"); for(int i = 0; i
< n; ++i) { Serial.print(i +1);
Serial.print(":
");Serial.print(WiFi.SSID(i));Serial.pr
int("
(");Serial.print(WiFi.RSSI(i));Serial.
print(")");
Serial.println((WiFi.encryptionType(i)==ENC_TYPE_NONE)?"":"*");delay(10);
}

}
Serial.println(""); delay(5000);
}
```

OUTPUT:



RESULT:

Thustheoutputforsensingtheavailablenetworksusing Arduinohassuccessfullyexecuted.

Date of Experiment:_____

EXPERIMENTNO. 02

AIM:

Towriteaprogramtomeasurethedistanceusingultrasonicsensorandmake LED blink using Arduino.

Practical Objectives:

1. Measure the distance using ultrasonic sensor and make LED blink using Arduino.

COMPONENTS REQUIRED:

1. Ultrasonic sensor.
2. Jumper wires.
3. Connecting cable or USB cable.

ALGORITHM:

STEP1: Start the process.

STEP2: Start ->Arduino IDE -1.8.8

STEP3:ThenenterthecodinginArduinoSoftware.STEP4:Compile the coding in Arduino Software.

STEP5:InArduinoboard,connectVCCtopowersupply5Vandconnecttogroundas in PIN gnd and connect trig to trigpio =9, connect echo to echopin=10 using jumperwires.

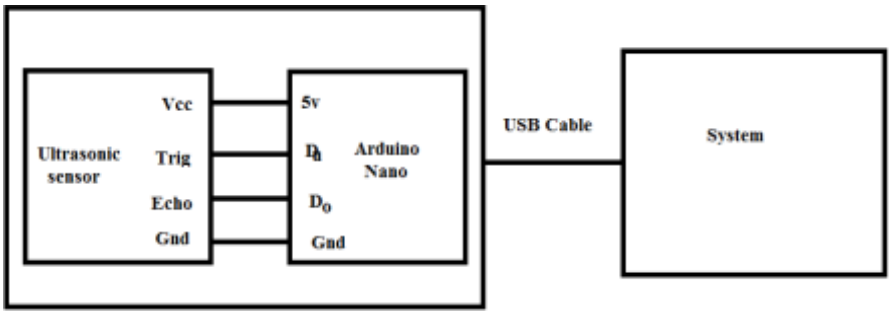
STEP 6: Connect the Arduino board with USB cable to the system. STEP 7: Selecttools-> select board ->Arduino Nano->select processor->ATMega328pandtheselect port.

STEP 8: Upload the coding in Arduino board and now for the LED to blink.

STEP9:Then,theoutputwillbedisplayedintheserialmonitor.

STEP10:Stopthe process.

BLOCK MODULE:

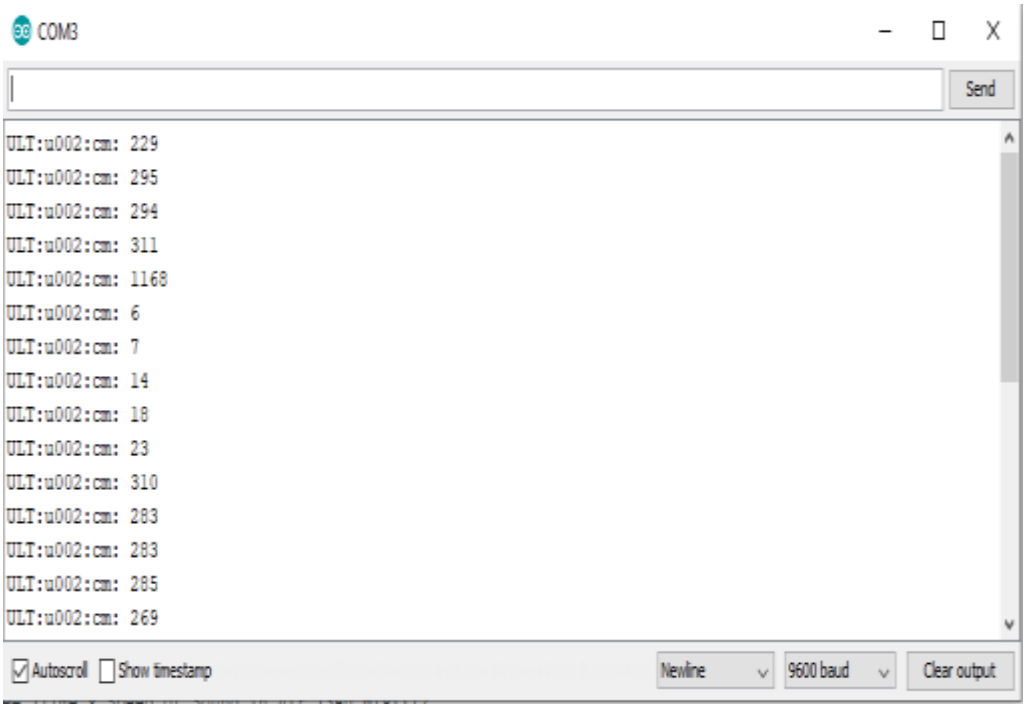


CODING:

```
const int trigPin = 9; const inttechoPin =
10; long duration;int distance; void
setup()
{
pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output pinMode(echoPin,INPUT); //
Sets the echoPin as an Input Serial.begin(9600); // Starts the serialcommunication
}
void loop()
{
digitalWrite(trigPin, LOW);// Clears the trigPin
delayMicroseconds(2);digitalWrite(trigPin,HIGH);//SetsthetrigPinonHIGHstatefor10microse
condsdelayMicroseconds(10);
digitalWrite(trigPin,LOW);duration=pulseIn(echoPin,
HIGH);
distance =duration*0.034/2;//distance=(TimexSpeedofSoundinAir(340m/s))/2


Serial.println(distance);delay(100
0);
}
```

OUTPUT:



RESULT:

Thus the output for measuring the distance using ultrasonic sensor and LED blink using Arduino has successfully executed

Date of Experiment:_____

EXPERIMENT NO: 3

AIM:

To write a program to detect the vibration of an object with sensor using Arduino.

Practical Objectives:

1.Detect the vibration of an object using Arduino.

COMPONENTS REQUIRED:

1. Vibration sensor
2. Jumper wires
3. USB cable

ALGORITHM:

STEP1: Start the process.

STEP2:Start ☾ Arduino.1.8.8.

STEP3:Then enter the coding in Arduino software.

STEP4:InArduinoboard,connectvcctopowersupply5Vandconnectdotoanalog pinA0 and connect gnd to ground gnd using jumper wires.

STEP5: Connect the arduino board with the USB cable tothe system.

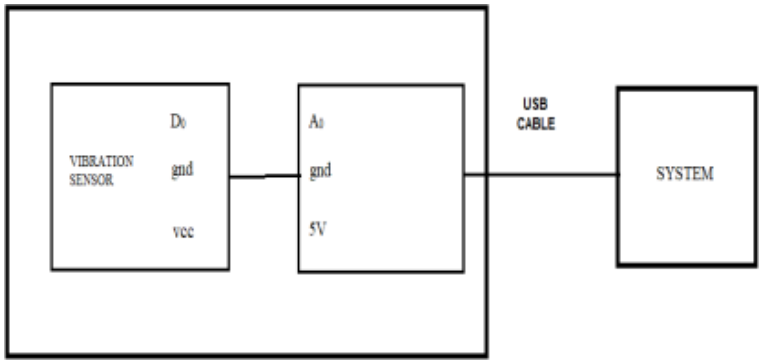
STEP6:Selecttools ☾ Selectboard ☾ ArduinoNanognd ☾ Selectprocessor ☾ ATmega 823p and then select the port.

STEP7: Upload the coding to theArduino board.

STEP8:Thentheoutputwillbedisplayedintheserialmonitor.

STEP9:Stopthe process.

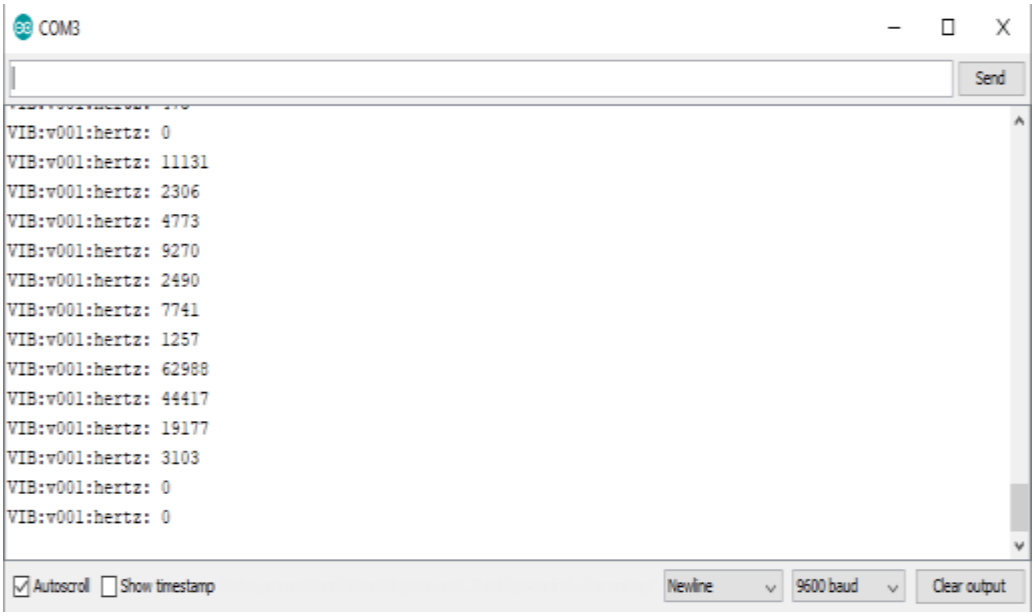
BLOCK DIAGRAM:



CODING:

```
Int ledPin = 13; Intvib=A0;
voidsetup()
{
pinMode(ledPin, OUTPUT);
pinMode(vib,INPUT);//setEPinputformeasurementSerial.begin(9600);//initserial9600
}
void loop()
{
long measurement=pulseIn (vib,
HIGH);delayMicroseconds(50);Serial.print("VIB:v
001:hertz: " );Serial.println(measurement);
}
```

OUTPUT:



RESULT:

Thus the output for detecting the vibrations of an object with vibration sensorusingArduino has been successfully executed.

Date of Experiment:_____

EXPERIMENT NO: 4

AIM:

To write a program to connect with the available Wi-Fi using Arduino

Practical Objectives:

1.CONNECTWITHTHEAVAILABLEWI-FIUSINGARDUINO

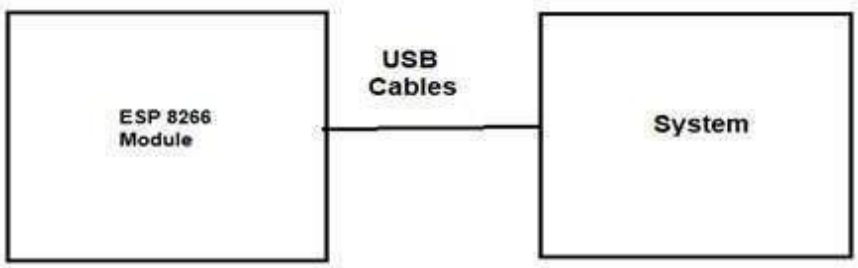
COMPONENTS REQUIRED:

1. ESP8266moduleorWi-Fimodule
2. Connecting cables or USB cables

ALGORITHM:

STEP1: Start the process.
STEP2: Start ☾ Arduino IDE 1.8.8.
STEP3: Include the file directory ESP8266 inArduino.
STEP4:ThenenterthecodingtoWi-FimoduleorESP8266module.STEP5:Thenenter the coding inArduino software.
STEP6:Connect theUSBcabletotheWi-FimoduleandtheArduinoconnectedsystem with available network.
STEP7: Select tools ☾ Select board ☾ Node MCU 0.9C ESP-12module and thenSelect ☾ Port.
STEP8:UploadthecodingtoESP8266moduleandopenserialmonitortoViewthe available network connects IPaddress.
STEP9: Stop the process.

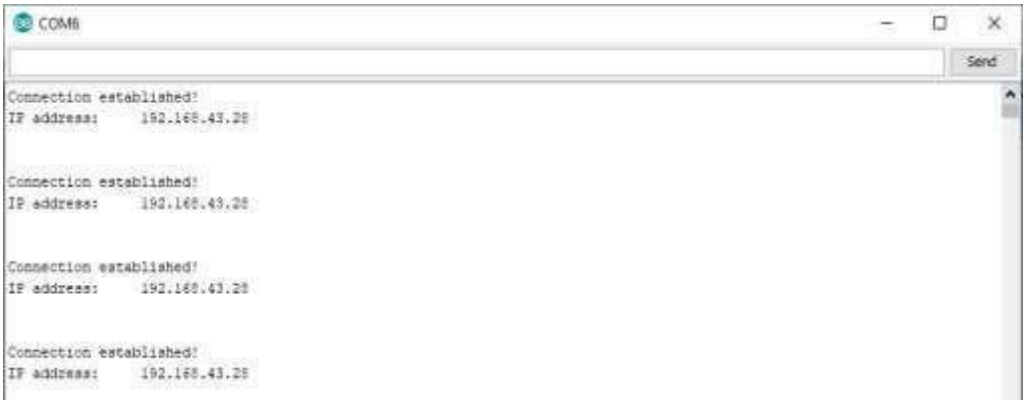
BLOCK DIAGRAM:



CODING:

```
#include<ESP8266WiFi.h>//IncludetheWi-Filibrary
constchar*ssid="Error";//TheSSID(name)oftheWi-Finetworkyouwanttoconnect to
constchar*password="networkerror";//Thepasswordof theWi-
Fi network voidsetup() {
Serial.begin(115200);//StarttheSerialcommunicationtosendmessagestothecomputer
delay(10); Serial.println('\n');
WiFi.begin(ssid,password);//ConnecttothenetworkSerial.print("
Connecting to ");
Serial.print(ssid);
Serial.print("...")inti
= 0;
while(WiFi.status()!=WL_CONNECTED){//WaitfortheWi-Fitoconnectdelay(1000);
Serial.print(++i); Serial.print(' ');
}
void loop()
{Serial.println('\n');
Serial.println("Connection
established!");Serial.print("IPaddress:\t");
Serial.println(WiFi.localIP());//SendtheIPaddressoftheESP8266tothecomputer
}
}
```

OUTPUT:



RESULT:

Thusthe output forconnectingwiththeavailableWi-FiusingArduinohasbeensuccessfully executed.

Date of Experiment: _____

EXPERIMENT NO: 5

AIM:

To write a program to sense a finger when it is placed on the board Arduino.

Practical Objectives:

1. Sense a finger when it is placed on board using Arduino.

COMPONENTS REQUIRED:

1. Touch Sensor
2. Jumper wire
3. USB cable

ALGORITHM:

STEP1: Start the process.

STEP2: Start ☾ Arduino 1.8.8

STEP3:Thenenterthecodinginarduinosoftware.STEP4:Compile the coding in the arduino software.

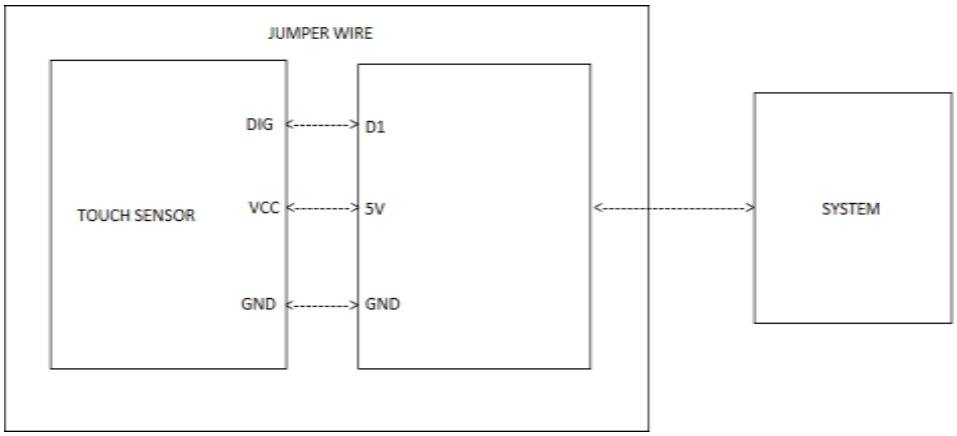
STEP5:Inarduinoboard,connectVCCtopowersupply5vandconnectSIGtoElectrical signal DTand connect to ground and wing jumper wires.

STEP6:Connectthearduinoboardwith USBcabletothesystem.STEP7:Selecttools Select processor board and port.

STEP8:Uploadthecodingtoarduinoboard.Thentheoutputwillbedisplayedin the serial monitor.

STEP9: Stop the process.

BLOCK DIAGRAM:



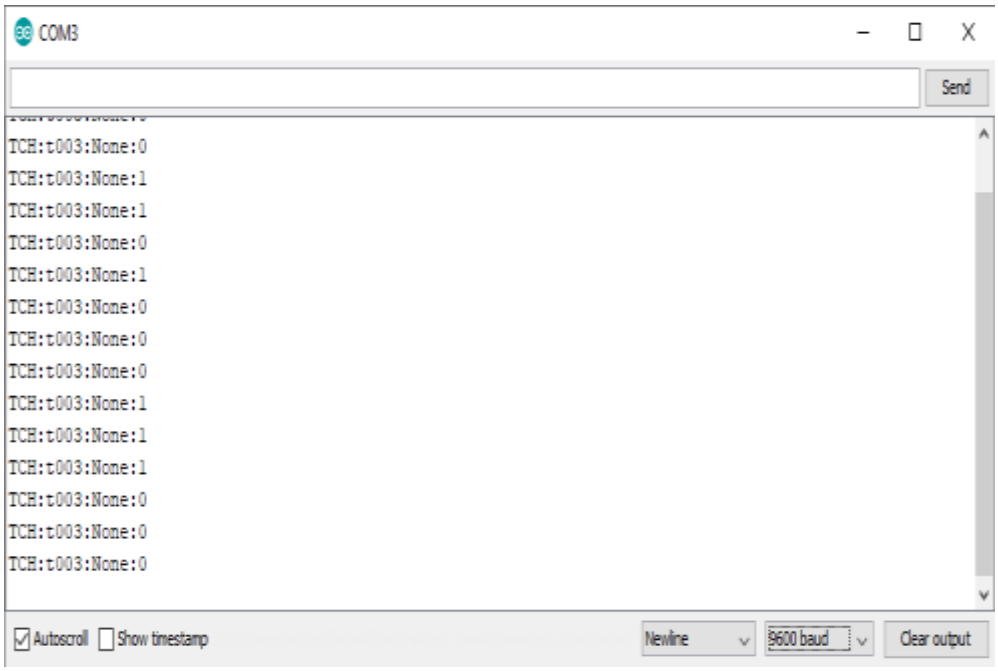
CODING:

```
int Led = 13 ; // define LED Interface
intbuttonpin=7;//defineMetalTouchSensorInterfaceintval;//define
numeric variables val
void setup ()
{
Serial.begin(9600);
pinMode (Led, OUTPUT) ; // define LED as output interface
pinMode(buttonpin, INPUT) ; // define metal touch sensor output
interface
}
void loop ()
{
val = digitalRead (buttonpin) ;
//Serial.println(val);
if (val == 1) //When the metal touch sensor detects a signal, LED flashes

{
digitalWrite (Led,
HIGH);Serial.println(val);delay(10
00);
}
else
{
digitalWrite(Led,LOW);Serial.prin
```

```
tln(val);delay(1000);
}
```

OUTPUT:



RESULT:

Thustheoutputforsensingafingerwhenitisplacedinboard Arduinohasbeensuccessfully executed

Date of Experiment: _____

EXPERIMENT NO: 6

AIM:

To write a program to get temperature notification using Arduino.

Practical Objectives:

1. Temperature notification using Arduino.

COMPONENTS REQUIRED:

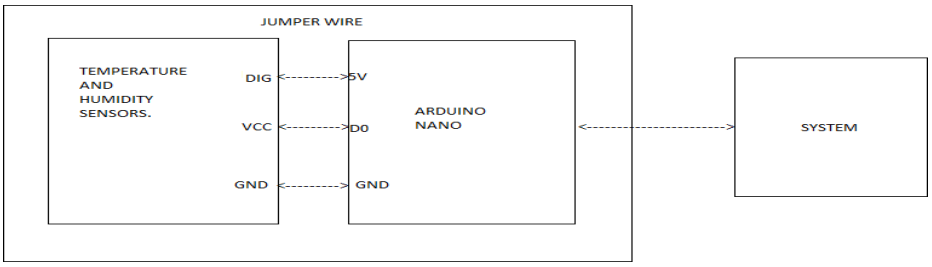
1. Temperatureandhumiditysensor.
2. Jumper wires
3. Connectivity cable or USB cable.

ALGORITHM:

STEP1: Start the process.

STEP2:Start ☾ Arduino 1.8.8
STEP3:IncludetheDHTlibrarytotheArduinosoftware.STEP4:Thenenter the coding inArduino software.
STEP5: Complete the coding inArduino.
STEP6:InArduinoboardconnectVCCtothepowersupply5VandconnectSIGto digital signal DTand connect SND to ground GND using jumper wires.
STEP7:ConnectthearduinoboardwithUSBcabletothesystem.STEP8:Selecttools ☾ Selected.
STEP9:Uploadthecodingtoarduinoboard.Thentheoutputwillbedisplayedin the serial monitor.
STEP10: Stop the process.

BLOCK DIAGRAM:

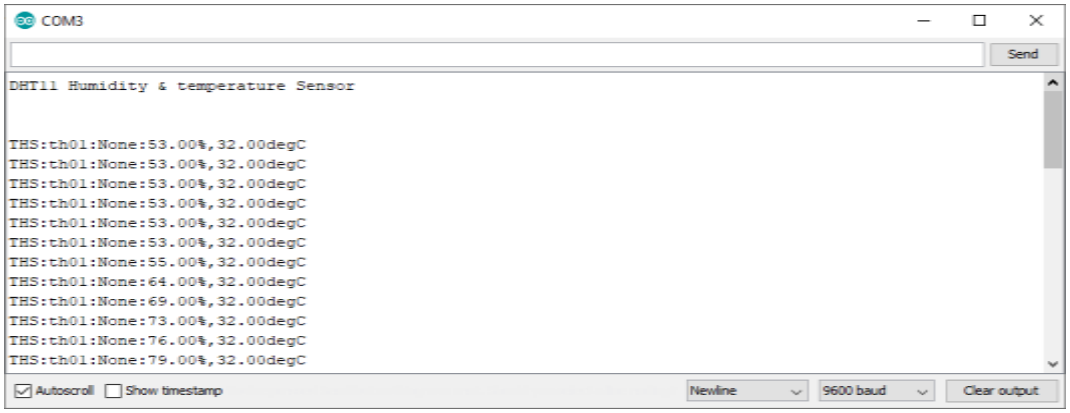


CODING:

```
#include <dht.h>
#define dht_apin A0 // Analog Pin sensor is connected to dht
DHT;void setup()
{
pinMode(A0,INPUT);Ser
ial.begin(9600);delay(500
);
Serial.println("DHT11Humidity&temperatureSensor\n\n");delay(1000);
}
void loop()
{
DHT.read11(dht_apin);Serial.print(
"THS:th01:None:");Serial.print(DH
T.humidity);Serial.print("%,");

//Serial.print("temperature =
");Serial.print(DHT.temperature);
Serial.println("degC");
delay(2000);//Wait5secondsbeforeaccessingsensoragain.
}
```

OUTPUT:



RESULT:

ThustheoutputtogettemperaturenotificationusingArduinohassuccessfullyexecuted.

Date of Experiment: _____

EXPERIMENT NO: 7

AIM:

To write a program for LDR to vary the light intensity of LED using Arduino.

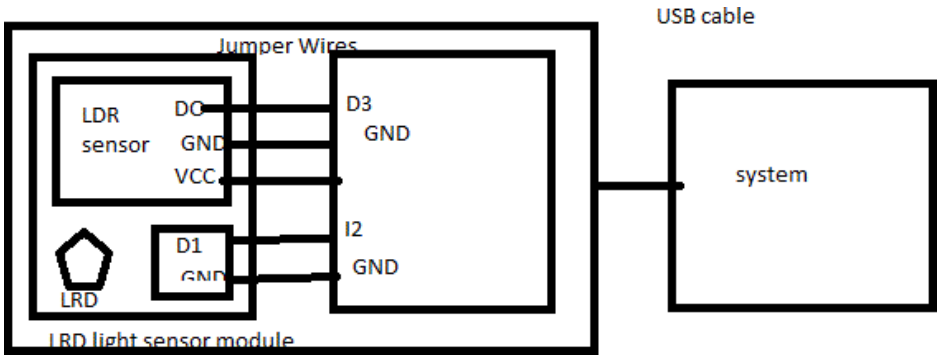
Practical Objectives:

1.LDR to vary the light intensity of LED using Arduino.

ALGORITHM:

STEP1: Start the program.
STEP2: Start →Arduino 1.88[IDE].
STEP3:EnterthecodinginArduinosoftware.STEP4:Compile the coding in theArduino software.
STEP5: From LDR light sensor module, connect VCC topower supply 5V andconnect to digital pin D3 andconnectGNDto ground gnd using jumper wires toarduino board.
STEP6: For LED, connect D to digital pin D2 and connect GND to ground GNDusing jumper wires to arduino board.
STEP7: Show the variance of lights intensity in LED we use LDR light sensormodule.
STEP8: Stop the process.

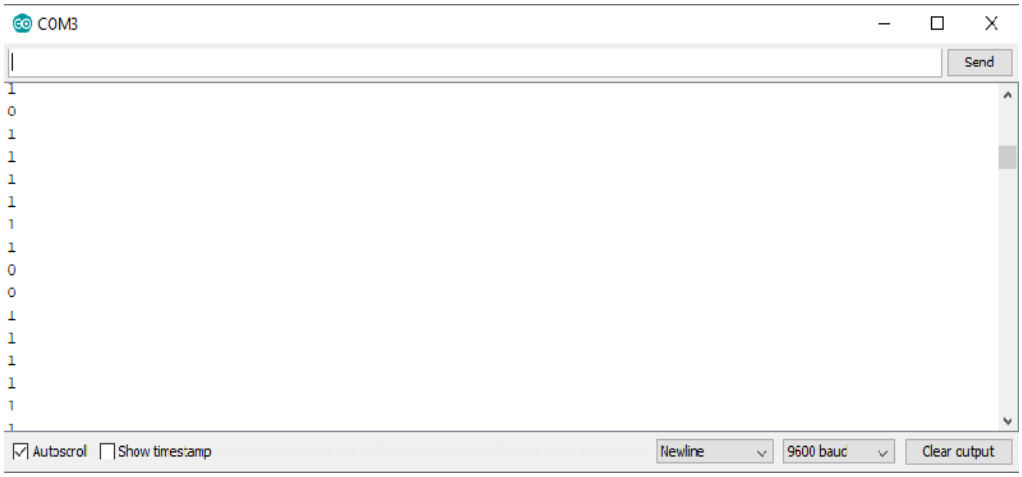
BLOCK DIAGRAM:



CODING:

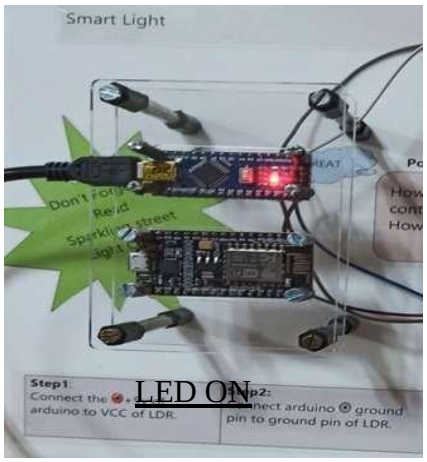
```
const int ldr_pin =3; const
intled_pin=2; void setup()
{pinMode(ldr_pin,
INPUT);pinMode(led_pin,
OUTPUT);Serial.begin(9600);
}
void loop() {
if ( digitalRead( ldr_pin ) == 1)
{digitalWrite(led_pin,HIGH);
}
else {
digitalWrite(led_pin,LOW);
}
Serial.println(digitalRead( ldr_pin
));delay(100);
}
```

OUTPUT:



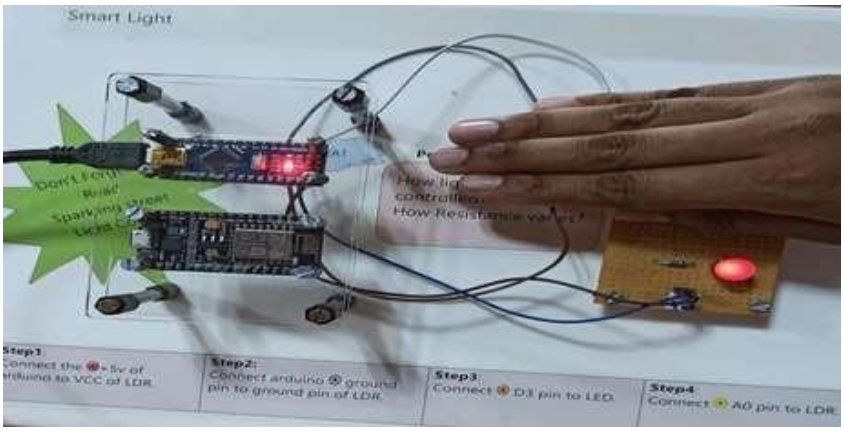
LEDOUTPUT:

LED OFF



LED ON

LED ON



RESULT:

ThustheoutputforLDRtovarythelightintensityofLEDusingArduinohassuccessfully executed.

Date of Experiment: _____

EXPERIMENT NO: 8

AIM:

To write a program to install MySQL database in Raspberrypi.

Practical Objectives:

1.MySQLdatabaseinstallationinraspberrypi.

COMPONENTS REQUIRED:

1. Raspberry pi
2. HDMI
3. Micro USB power input

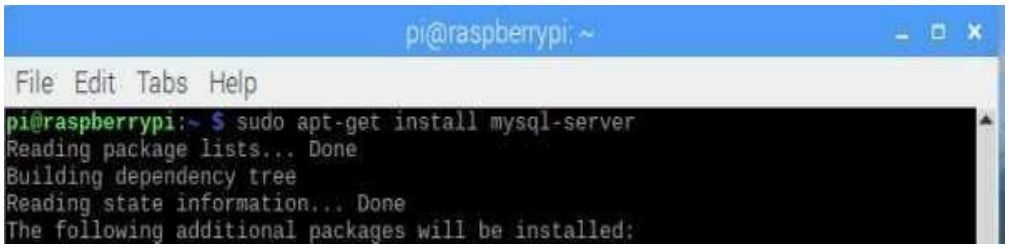
ALGORITHM:

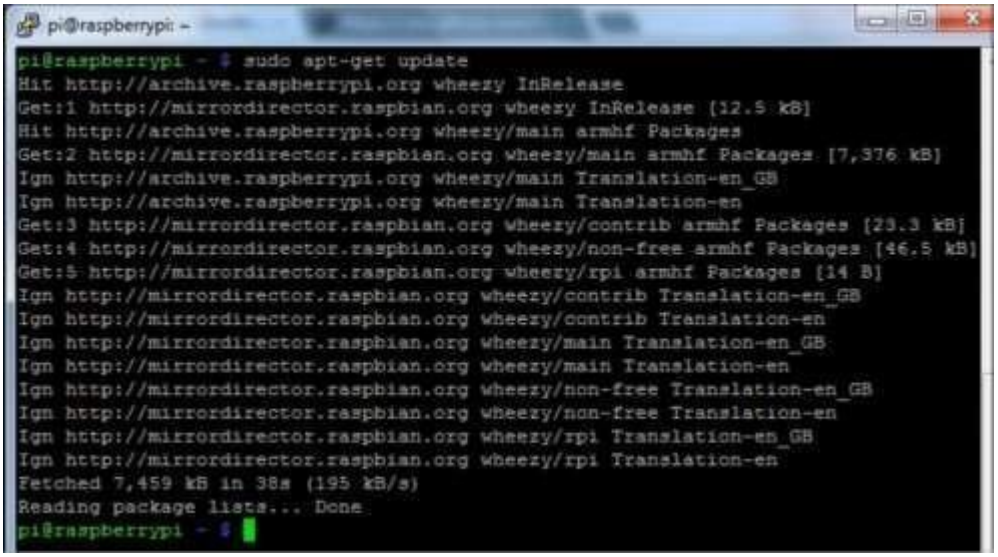
STEP1: Start the process
STEP2: Connect micro USB power input to Raspberry pi.
STEP3: Connect HDMI to the system to act as monitor forRaspberry pi.
STEP4: Connect USB port to mouse and keyboard.
STEP5:thenenterthecodinginterminalforinstallingMySQLtoRaspberrypi.STEP6: stop the process.

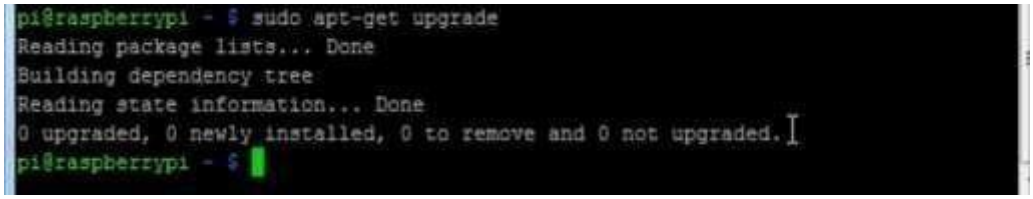
CODING:

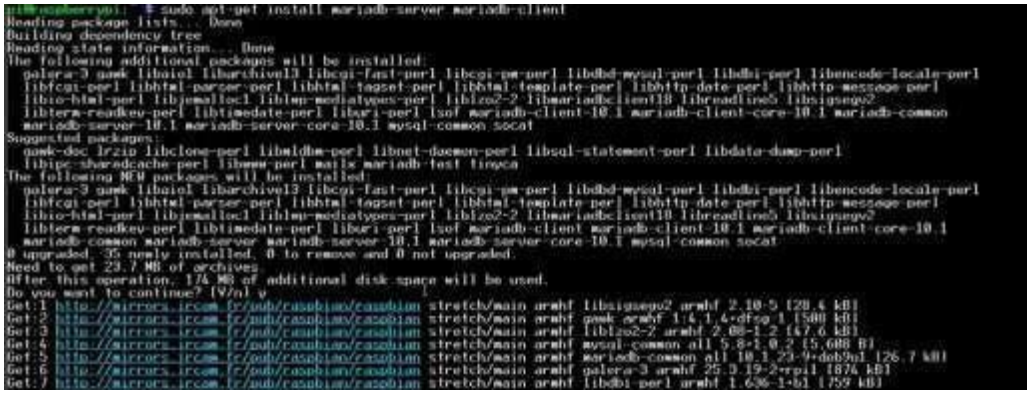
```
sudo apt-get install mysql-server sudoapt
update
sudo apt upgrade
sudo apt install mariadb-
serversudomysql_secure_installati
onsudomysql -u root –p
```

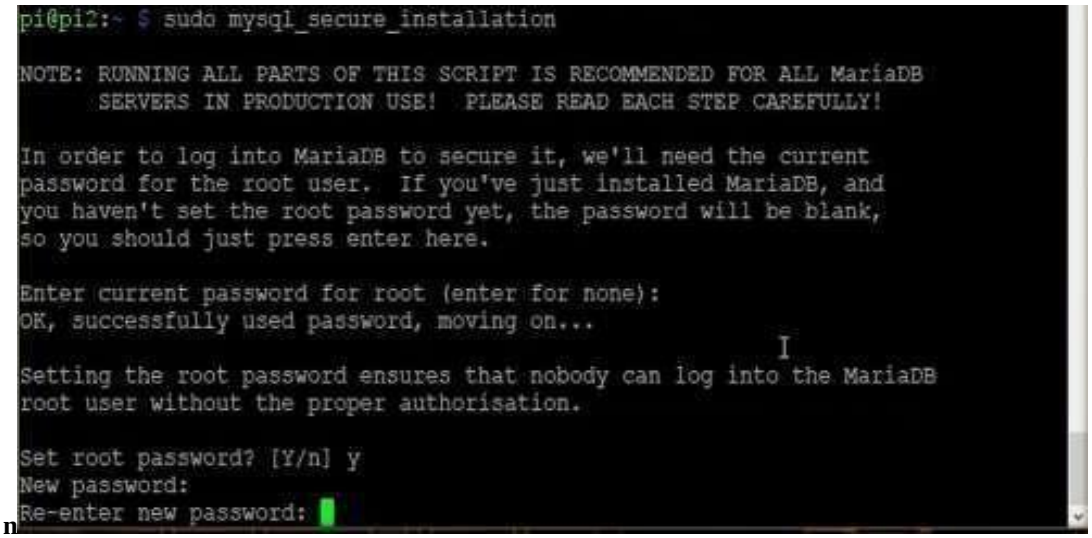
OUTPUT:


pi@raspberrypi: ~
File Edit Tabs Help
pi@raspberrypi:~ $ sudo apt-get install mysql-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:

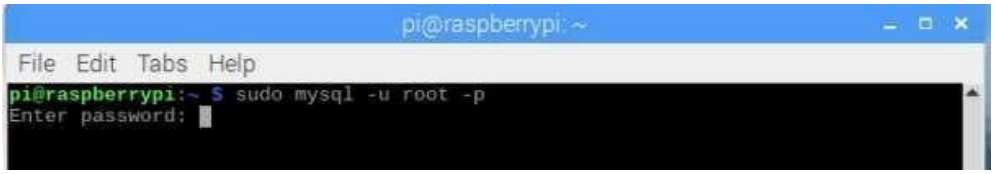

pi@raspberrypi ~ $ sudo apt-get update
Hit http://archive.raspberrypi.org wheezy InRelease
Get:1 http://mirrordirector.raspbian.org wheezy InRelease [12.5 kB]
Hit http://archive.raspberrypi.org wheezy/main armhf Packages
Get:2 http://mirrordirector.raspbian.org wheezy/main armhf Packages [7,376 kB]
Ign http://archive.raspberrypi.org wheezy/main Translation-en_GB
Ign http://archive.raspberrypi.org wheezy/main Translation-en
Get:3 http://mirrordirector.raspbian.org wheezy/contrib armhf Packages [23.3 kB]
Get:4 http://mirrordirector.raspbian.org wheezy/non-free armhf Packages [46.5 kB]
Get:5 http://mirrordirector.raspbian.org wheezy/rpi armhf Packages [14 B]
Ign http://mirrordirector.raspbian.org wheezy/contrib Translation-en_GB
Ign http://mirrordirector.raspbian.org wheezy/contrib Translation-en
Ign http://mirrordirector.raspbian.org wheezy/main Translation-en_GB
Ign http://mirrordirector.raspbian.org wheezy/main Translation-en
Ign http://mirrordirector.raspbian.org wheezy/non-free Translation-en_GB
Ign http://mirrordirector.raspbian.org wheezy/non-free Translation-en
Ign http://mirrordirector.raspbian.org wheezy/rpi Translation-en_GB
Ign http://mirrordirector.raspbian.org wheezy/rpi Translation-en
Fetched 7,459 kB in 38s (195 kB/s)
Reading package lists... Done
pi@raspberrypi ~ $


pi@raspberrypi ~ $ sudo apt-get upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
pi@raspberrypi ~ $


pi@raspberrypi: ~ $ sudo apt-get install mariadb-server mariadb-client
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
galera-3 gawk libaio1 libarchive13 libcgi-fast-perl libcgi-pm-perl libdbd-mysql-perl libdbi-perl libencode-locale-perl
libfcgi-perl libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl libhttp-date-perl libhttp-message-perl
libio-html-perl libjemalloc1 liblwp-mediatypes-perl liblzo2-2 libmariadbclient18 libreadline5 libsigsegv2
libterm-readkey-perl libtimedate-perl liburi-perl lsof mariadb-client-10.1 mariadb-client-core-10.1 mariadb-common
mariadb-server-10.1 mariadb-server-core-10.1 mysql-common socat
Suggested packages:
gawk-doc lrzip libclone-perl libmldbm-perl libnet-daemon-perl libsql-statement-perl libdata-dump-perl
libipc-sharedcache-perl libwww-perl mailx mariadb-test tinyca
The following NEW packages will be installed:
galera-3 gawk libaio1 libarchive13 libcgi-fast-perl libcgi-pm-perl libdbd-mysql-perl libdbi-perl libencode-locale-perl
libfcgi-perl libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl libhttp-date-perl libhttp-message-perl
libio-html-perl libjemalloc1 liblwp-mediatypes-perl liblzo2-2 libmariadbclient18 libreadline5 libsigsegv2
libterm-readkey-perl libtimedate-perl liburi-perl lsof mariadb-client mariadb-client-10.1 mariadb-client-core-10.1
mariadb-common mariadb-server mariadb-server-10.1 mariadb-server-core-10.1 mysql-common socat
0 upgraded, 35 newly installed, 0 to remove and 0 not upgraded.
Need to get 23.7 MB of archives.
After this operation, 174 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://mirrors.ircam.fr/pub/raspbian/raspbian stretch/main armhf libsigsegv2 armhf 2.10-5 [28.4 kB]
Get:2 http://mirrors.ircam.fr/pub/raspbian/raspbian stretch/main armhf gawk armhf 1:4.1.4-dfsg-1 [500 kB]
Get:3 http://mirrors.ircam.fr/pub/raspbian/raspbian stretch/main armhf liblzo2-2 armhf 2.08-1.2 [47.6 kB]
Get:4 http://mirrors.ircam.fr/pub/raspbian/raspbian stretch/main armhf mysql-common all 5.8+1.0.2 [5,608 B]
Get:5 http://mirrors.ircam.fr/pub/raspbian/raspbian stretch/main armhf mariadb-common all 10.1.23-9+deb9u1 [26.7 kB]
Get:6 http://mirrors.ircam.fr/pub/raspbian/raspbian stretch/main armhf galera-3 armhf 25.3.19-2+rpi1 [874 kB]
Get:7 http://mirrors.ircam.fr/pub/raspbian/raspbian stretch/main armhf libdbi-perl armhf 1.636-1+b1 [759 kB]



n



RESULT:

Thus the output to install MySQL database in Raspberry pi has successfully executed.

Date of Experiment: _____

EXPERIMENT NO: 9

AIM:

To write a program to work with basic MySQL queries by fetching data from database in Raspberry pi.

Practical Objectives:

Sql queries by featching data from database in Respberry pi.

COMPONENTS REQUIRED:

1. Raspberry pi
2. HDMI
3. Micro USB power input

ALGORITHM:

STEP1: Start the process.
STEP2: Connect micro USB power input to Raspberry pi.
STEP3:ConnectHDMItothesystemtoactasmonitorforRaspberrypi.STEP4:
Connect USB port 2.0 to mouse and keyboard.
STEP5:Whenenterthecodingintheterminaltoupdateandupgradepackageusingcommands.
STEP6:CreatedatabaseinMySQLandbasicSQLqueriesbyfetchingdatafromdatabase by using insert, update and delete queries.
STEP7: Stop the process.

CODING:

```
sudomysql -u root –p
CREATEDATABASEexampledb;
CREATEUSER'exampleuser'@'localhost'
                        IDENTIFIEDBY'pimylifeup';CREATETABLEB
ooks(Id                 INTEGER      PRIMARY
                        KEY,TitleVARCHAR(100),AuthorVARCHAR(6
0));
INSERT INTO Books(Title, Author) VALUES (1,‘War and Peace’,‘Leo
Tolstoy’);SELECT* FROM Books;
UPDATEBooksSETAuthor='LevNikolayevichTolstoy'WHERE Id=1;
```

DELETE FROM Books2WHERE Id=1;

OUTPUT:

|Id|Title|Author|
+ + + +
+ + + +

+ + + +
|Id|Title|Author|
+ + + +
|1|WarandPeace|LeoTolstoy|
+ + + +

+ + + +
|Id|Title|Author|
+ + + +
|1|WarandPeace|LevNikolayevichTolstoy|
+ + + +

|Id|Title|Author|
+ + + +
+ + + +

RESULT:

The output to fetch data from database using SQL queries in Raspberry pi has successfully executed.

Date of Experiment: _____

EXPERIMENT NO: 10

AIM:

To write a program to switch light on when the input is1and switch the light off when the input is 0 using Raspberry pi.

Practical Objectives:

1. Switchlight onANDoff basedon the inputof user usingRespberry pi.

COMPONENTS REQUIRED:

1. Raspberry pi
2. Breadboard
3. Jumperwires
4. Resistor
5. LED

ALGORITHM:

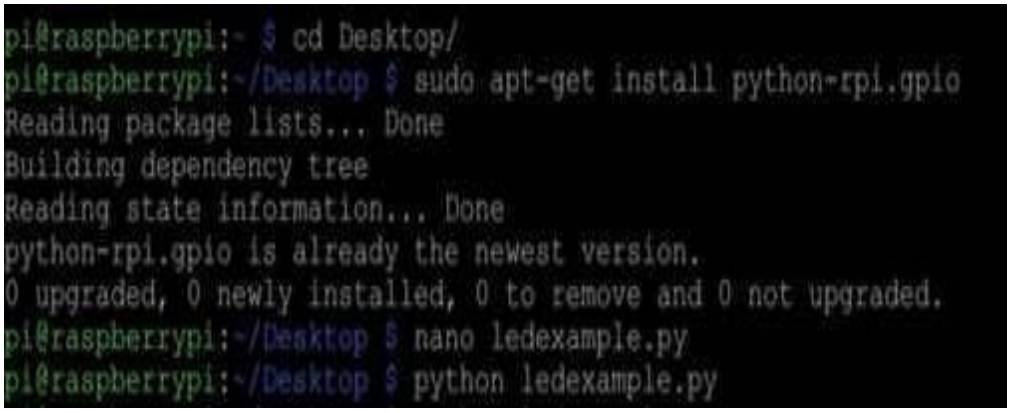
STEP1: Start the process.
STEP2: Connect micro USB power input to Raspberry pi
STEP3:ConnectHDMItothesystemtoactasmonitorforRaspberrypi.STEP4:
Connect USB port 2.0 to mouse and keyboard.
STEP5: Enter the coding in the terminal for installing python and GPTO.STEP6:Opennotepa→entercoding→saveas→fileextensionpythonorpy.
STEP7: Copy file location → open terminal → paste file location in terminal → pressenter.
STEP8: In the terminal window to get output enter 0 or 1, to switch light ON when theinput is 1 and switch light OFF when the input is 0 in breadboard using Raspberry pi.STEP9: Stop the process.

.

CODING:

sudo apt-get install python-pip sudo apt-get install python-dev sudo pip installRPi.GPIO
sudo –i #python
importRPi.GPIOasGPIOimporttimeGPIO.setmode(GPIO.BCM)GPIO.setwarnings(False) GPIO.setup(18,GPIO.OUT)ip=int(input("enter the value: ")) ifip==1:
print "LED on"
GPIO.output(18,GPIO.HIGH)time.sleep(1)
elifip==0:
print"LEDoff"GPIO.output(18,GPIO.LOW)time.
sleep(1)

OUTPUT:



RESULT:

Thus the output to switch light ON/OFF using Raspberry pi has been successfully executed.