A

PROJECT REPORT

ON

DIGITAL ELECTRONICS BOARD USING

GSM MODULE AND DATABASE

Submitted by

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(1614101175)

In partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

ELECTRICAL AND ELETRONICS ENGINEERING

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Table Of Contents

LIST OF FIGURES

SCHOOL Of ELECTRICAL, ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE

This is to verify that the project with title "Digital Electronics board using gsm module and database'' is the bonafide work carried out by student Sumit Kumar Upadhyay, during the academic year 2019-20. We approve this project for submission in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Electrical and Electronics Engineering, Galgotias University.

Mrs. Indu Bhardwaj

Project Guide(s)

The Project is Satisfactory / Unsatisfactory

_____   _____

Internal Examiner (s)   External Examiner

Approved By

_____   *Dean*

DECLARATION

We declare that the work presented in this report titled "Digital Electronics board using GSM module and database", submitted to the Department of Electrical and Electronics Engineering, Galgotias University, Greater Noida, for the Bachelor of Technology in Electrical and Electronics Engineering is our original work. We have not plagiarized unless cited or the same report has not submitted anywhere for the award of any other degree. We understand that any violation of the above will be cause for disciplinary action by the university against us as per the University rule.

Signature:

Name: Sumit Kumar Upadhyay

Enrollment No: 1614101175

Date   :

ACKNOWLEDGEMENT

ABSTRACT

Digital Electronics Notice Board is used on public utility places like Institution or organization or College campus, Railway stations etc. Now a days sending various data on paper notice boards has become difficult and time consuming. The idea taken for this development is to deliver their user a humble, debauched and dependable technique to place significant announcements in an LCD display wherever the operator can simply send a message which will display in the LCD exhibition. Our propound system will enable people to transmit notice data on a digital notice board by using their mobile phones. Our propound project enable people to send messages from their phone by using any sim card. The proposed project basically consists a 32-bit ARM which is based on microcontroller LPC 2148, GSM SIM 900 module, a machine tender for user interface through the Required hardware. The device can be used wherever expect the place where development provided portable net connectivity is available most of the time.

PROBLEM STATEMENT

In the previous developed system, we can only send the massage via phone text but in my proposed system we can send the data in multiple way which includes Google assistant, android application. In some previous proposed system the data stored by using cloud storage which can be expensive but in our case we have stored data by using Normal database based on the computer in which a multiway transferable cable is used to store the data which is connected to the GSM module and microcontroller.

1. __INTRODUCTION__

The GSM based digital electronics board can also be called data display system (DDS). It is basically aimed at the colleges, university and public places like bus station and railway station for displaying essential data in fast way.

The data displaying duration could be a day to day continuously or on a regular interval. It proposed elasticity to people to display/flash news or announcement faster than done by system which is programmable. The main feature of this system is that it does not affect surrounding environment.

The proposed system consists of 8051 Microcontroller, Arduino board, GSM SIM900, Phone, LCD display mode. The process of this system is first it will take input in format of text by user, that could be typed by user via phone or using feature of Google assistance [1].

The text is sent to the Arduino where with the help of Microcontroller it showed on the LCD display. While sending the text to display board, the data is also saved in a Database for keeping history. The Database used is MySQL.

The process of proposal contains categorizing the different apparatuses and accumulate all of them which allows it for proper communication. Then the coding process will be done, in which it must be take care that the difference between continuously multiple communications and most importantly

substantiation of the sender's number [2]. The coding Process also involves the database connectivity for purpose of storing displayed data.

1.1. What make SMS Messaging system more successful all over the world?

SMS got success all over the world in current situation. A number of SMS system of massaging swapped every single daytime is uncountable. SMS texting is now become one and only the utmost imperative returns causes of radio shippers and system. Some of the reasons we discussed below that why SMS is so popular worldwide and what is special about SMS.

SMS Message could Read and sent simultaneously: These days, nearly each individual takes a portable handset and they can share massages to every person. By means of a portable handset, you can read and sent SMS system of massaging at any point of time anywhere wherever the network is available.

SMS system of massaging can also be Send on the way to a Down Portable Headsets: Incongruent on a phone call, anyone can send a SMS to any of his friend either he is in reachable network or not. This SMS massage erection of the operator of the portable system drive hoard the SMS system of massaging on their platform and when the user will be on available network or as soon as he gets the network in his phone, he will receive massage.

SMS texting is Less Worrying While We Can Still Sojourn in Dash: Incongruent the call received in phone, you don't essential to read or reply an

SMS note instantly, you can reply as per your convenience. Also, reading and typing SMS message will never make any noise. Though you don't have to run out of any place to just for a giving answer on a phone call, you can just easily type massages wherever you are and without disturbing anyone.

SMS system of massaging are Maintained through 100% GSM Portable Headsets and they can be swapped flanked by dissimilar radiocommunication transporters: SMS system of texting is a well-developed expertise which is also most used technology now a days. Almost every GSM mobile phone sustenance it. Non solitary that you cannister conversation SMS system of massaging through portable operators of the similar tuner carrier, but then you can too conversation SMS system of massaging with mobile users of numerous extra tuner haulers wide-reaching or all over the world without disturbing anyone.

CURRENT SCENARIO: -

At this time, we be sure of on banging up announcements on the noticeboards by means of paper. So, this time overwhelming since we all want time for formulating notice. Also, there is excess of paper. If we want to update notification then we necessity to recommence the announcement board then we partake to yield a original hardcopy and again take time to paste it on required place.

1.2. WHAT IS RADIOCOMMUNICATION ANNOUNCEMENT PANEL?

Wireless announcement board is an electronic device used to transfer or display announcement's or text or data in a fast way compare to the alternate method.

1.3. COMMUNICATION METHODS:

GSM TECHNOLOGY: GSM stands for Global System for Mobile Communiqué. It is a cellular communication system which is accepted as ordinary aimed at numerical cellular message. It is the name of a adjustment assemblage recognized in 1982 to generate a mutual European portable handset standards.

RF MODULES: An RF wireless communications organization working on the occurrence of interrupted noise atmosphere, comprises primary and additional radiocommunication campaigns, apiece such expedient partaking, a basis of control, a transceiver joined to the control basis, for conveying in addition getting radio info and a manager/CPU for regulate the process of transceiver.

BLUETOOTH: Bluetooth is widely known as an exposed radio etiquette for switching data for short length from fixed portable campaigns, generating individual zone systems (PANs). It was initially perceived as an wireless substitute to RS232 information cable.

2. LITERUTRE SURVEY

GSM basically Refers to the term Global System for Mobile Communications. These days lots of people have showed much curiosity to know more about perception associated to GSM. So, in this given topic we have done survey which includes lean of numerous kinds of GSMs based project thoughts which are having much in demand and also very stimulating to learn who eagerly want to know GSM concept. The proposed project idea is based on GSM technology on which we have done survey would give better idea about the GSM knowledge practically and theoretically both.

2.1-GSM BASED DISPLAY TOOLKIT: -

currently, the radio receiver communication or Bluetooth based system has been announced their influx on a huge stage and in future world is going to be totally dependent on mobile. So, in upcoming days we hunger to regulate the whole thing without moving an inch of step. This technology which is completely linked to the remote of utilizations can be possible also through Embedded Systems or technology.[3] The key aim of the proposed system will be to design a SMS driven based display toolkit which can replace the currently used programmable electronic display and paper-based notice board system. This system is proposed for designing for receive along with display-based toolkit which will programmed through an official mobile phone which would be easy to understand. The message which would display is sent over an SMS based

system from an verified transmitter and the transmitter could in many forms [3]. The device which would receive the SMS, it will first Validates the sending Mobile Identification Number (MIN) and then it would display the required information only after necessary code adaptations and necessary steps done.

2.2 DEVELOPMENT OF SMS BASED TEACHING AND LEARNING SYSTEM:

SMS- refer to the term Short Message Service technology, which is now one of the utmost unchanging and usable mobile technologies from place to place the world. Now a days almost every student carries their phone with SMS features installed in their phone which can be used for teaching, learning or many other purposes. In our research paper, we have mentioned too many project using SMS based technologies and also in many papers which we did not mentioned, has proposed system based on SMS but they have not provided the possible and easily implementable technologies which a learning and personality development systems expect. [4]. The proposed system is capable to use as the demand technology for learning purpose and almost it would successes.

2.3 MULTIPLE UNIT GSM CONTROLLED DEVICE:

We always want some information of our interested field to control systems of our choice. In this electronics era and digital systems, it has become essential to control and obtain information from everywhere and better if it is in multiple way [5]. The RMS in quite a lot of home and office applications are a subject of gaining attention and if we talk about recently passed years, we had seen lots of

8

systems which is providing such type of controls and related technologies. In these literatures we have settled a preferred interface which is a phone-based or SMS based digital Electronics board which can be controlled by multiple way. The multiple way includes SMS text via phone, using google assistant and using android application [6].

2.4 MAKING SYSTEM ENABLE FOR MULTIPLE WAY:

As our proposed system enable user to send data by using GSM sim card, we also made our system which enables user to send data just by speaking. The user tells google to "hey google, display my project name on LCD" and after this performed action, the data will be displayed on screen. In this way user have multiple way to communicate with device.

3. BASIC MODEL OF THE SYSTEM:

Figure 1: basic model of the proposed system
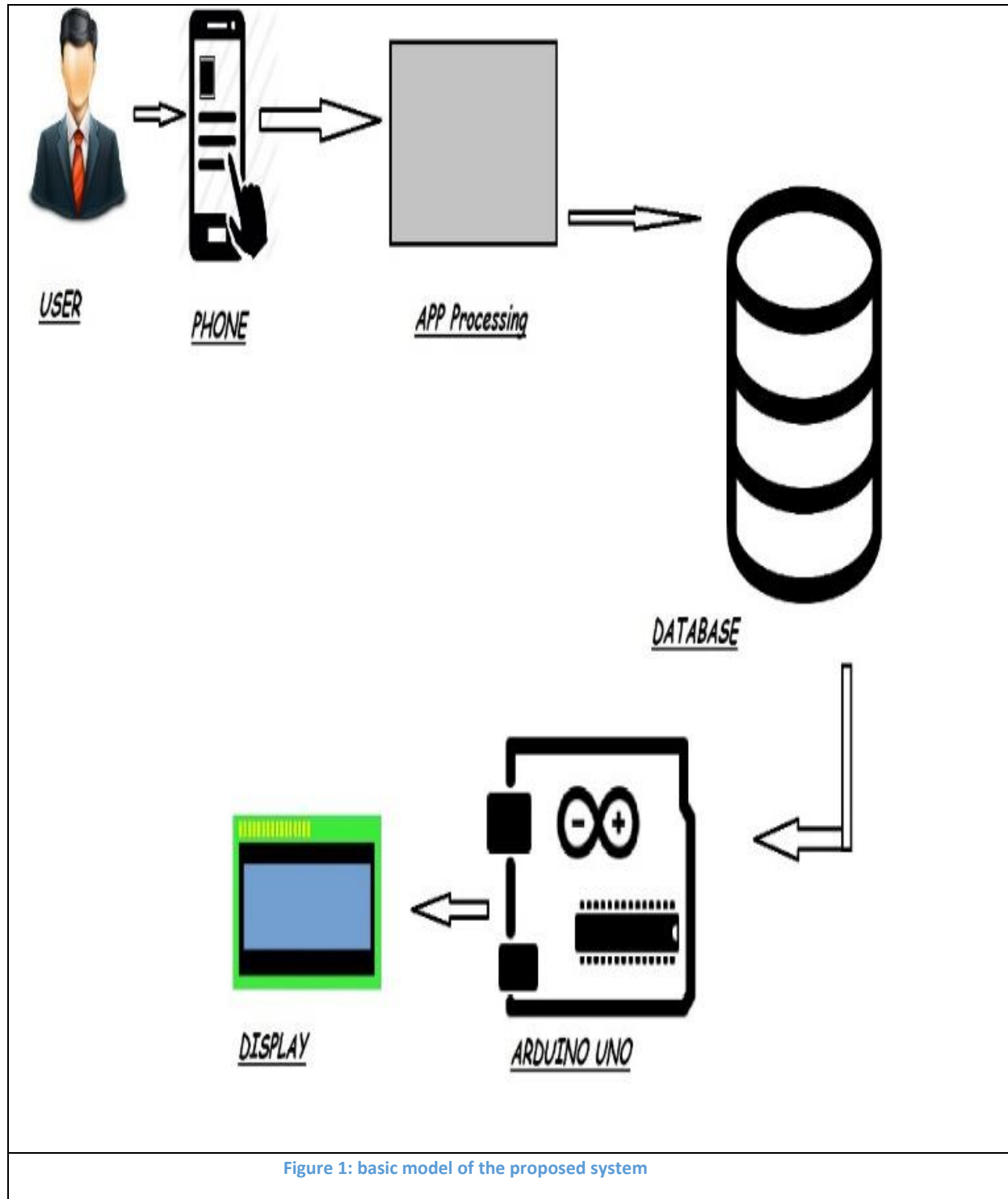
4.1 MICROCONTROLLER - AT89C52

A micro-controller of model AT89C52 is used for the purpose to reduce or work on low-power with the system compatibility of high-performance.it is also can be Programmed on Erasable Read Only Memory (PEROM). We can perform the action read and write both in the micro-controller. It is basically used to control the process happening in connected device. Below we have mentioned some important features of micro-controller which basically micro-controller performs or provide us the features to use-

- 8000 bytes of In-System Re-programmable Flashy Retention

- Strength: one thousand Inscribe/Erase Cycle

- Completely Stationary Process: 0 Hz to 24 MHz

- Third-Level Program Retention Deadbolt

- Two fifty-six into eight-Bit Core RAM

- Thirty-two Programed able I/O Line
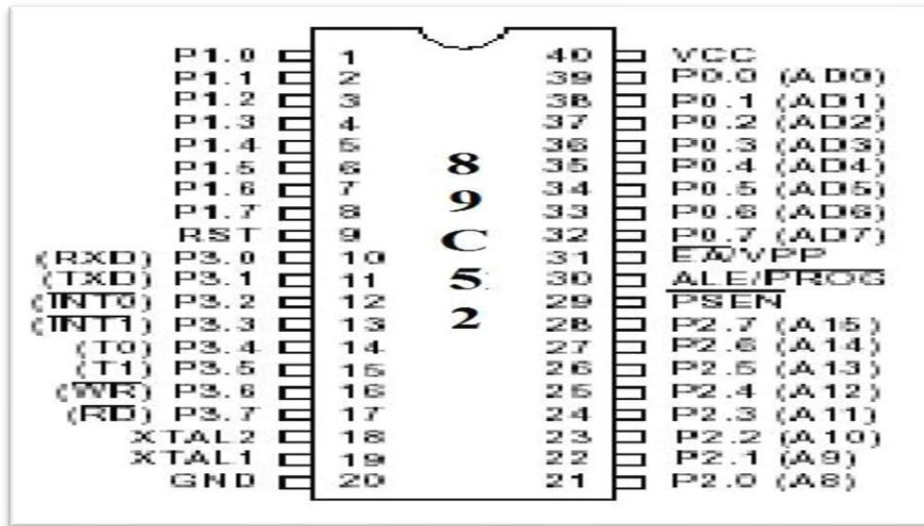
- Three sixteen-Bit Regulator/Securities

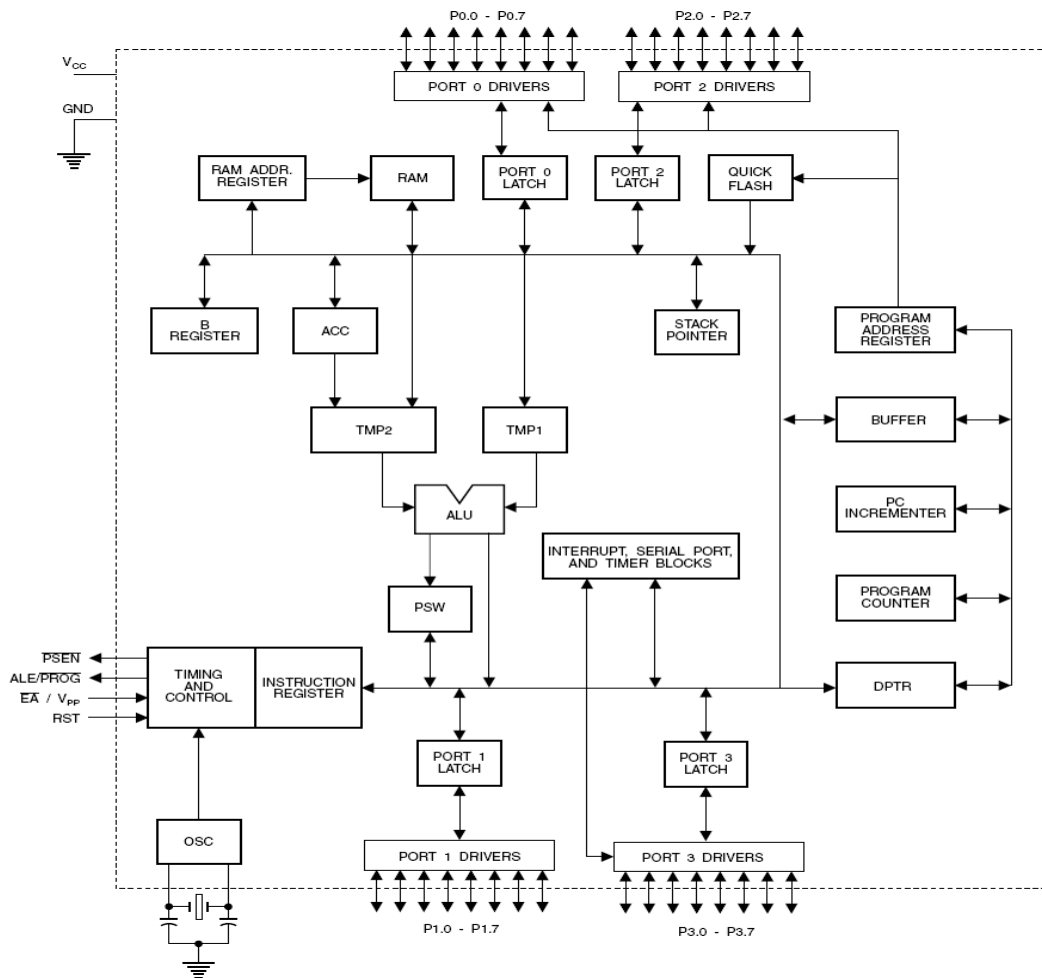Figure 2: architecture of micro-controller 2

Figure 3: internal architecture of micro-controller

12

4.2 LCD:

LCD term stands for liquid crystal display. It is basically designed in format of thin screen for display which basically consist numeral of color based on monochrome pixels. It is exhibited in obverse of a bright basis or indicator. Every pixel of the LCD consist pillar of liquid crystal molecules adjourned flanked by two see-through electrodes. And that two polarizing strainers, the hatchets of polarity, they are vertical to respectively additional mostly.
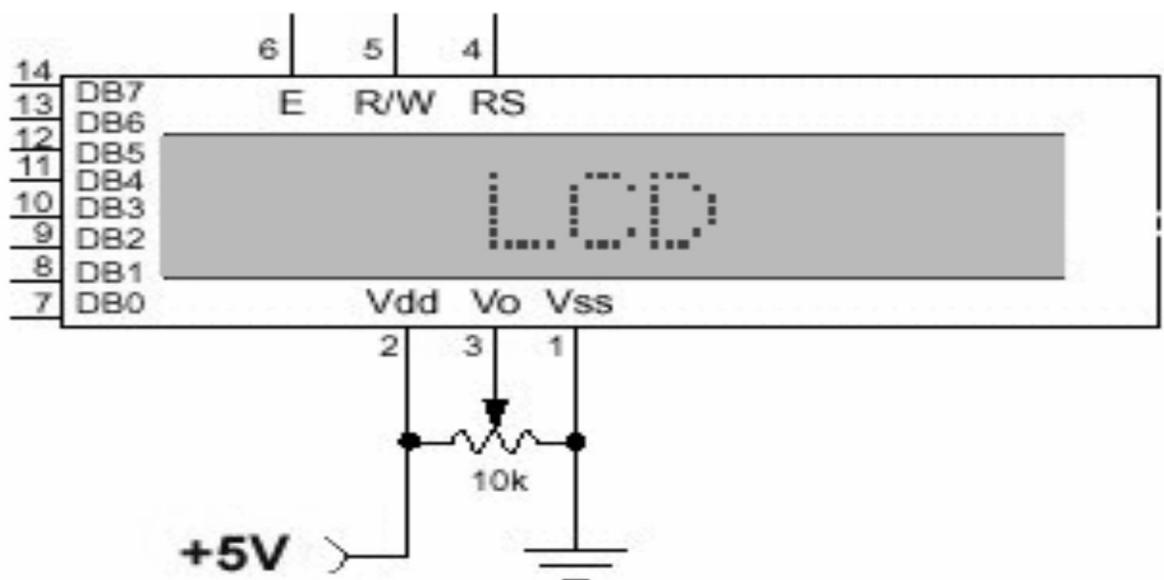
Figure 4: LCD display diagram

4.3 SUBSCRIBER IDENTITY MODULE (SIM):

The SIM positions for subscriber identity module. It is basically a identity of a person who holds the network referring a ten digit number. It actually holds the information and tell the network that who is this person and to whom he wants to connect the communication. One of the important structures of GSM is the Subscriber Identity Module, commonly known as a SIM card. it is also known as smartcard which hold the information of the users.

Figure 5: subscriber identity module

4.4- GSM:

GSM stands for Global System for Mobile Communication. It is a cellular communication system which is accepted as ordinary for numerical cellular message. It is the designation of a adjustment assemblage recognized in 1982 to generate a mutual European portable telephone standards.
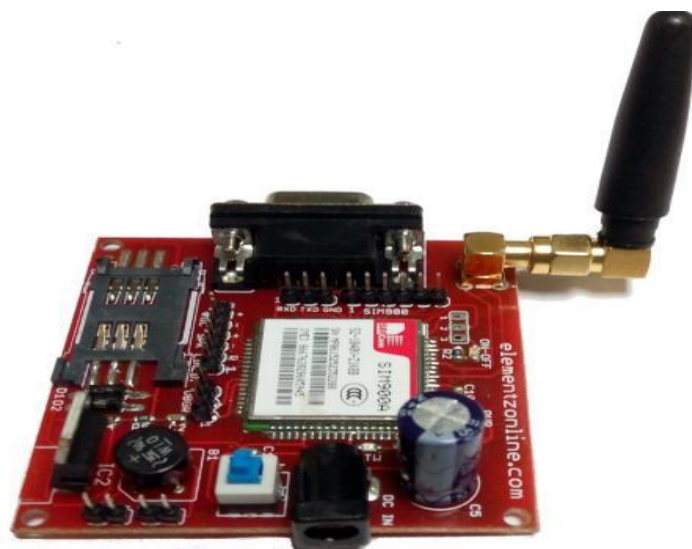
Figure 6: architecture of GSM

4.5 Power SUPPLY:
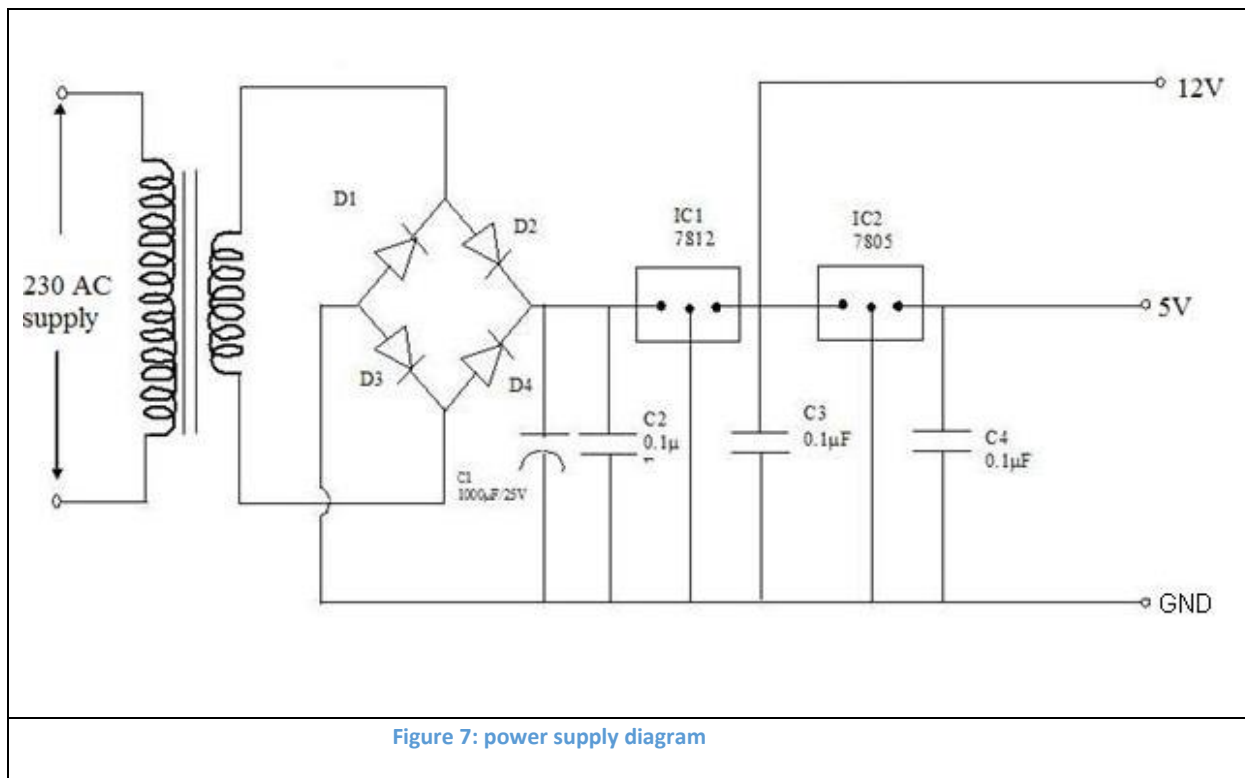
4.6 Step down transformer:

Step down transformer is used to adjust the voltage according to the requirement. When the AC supply is applied to the primary winding of the power transformer it can be change the state of supply either in stepped down condition or step up condition depending on the value of DC required by the system. The following modification will provisionally cause the opposite. The present score of the modifier rummage-sale in our scheme is 2A.

4.7 Rectifier:

Rectification of power supply is required while providing the voltage supply to any system. While providing voltage or power supply unit, rectification is achieved. Diode has the features which allow electron to flow in unidirectional way. When the AC supply is every day to the primary winding of the power transformer it can be change the state of supply either in stepped down condition or step up condition contingent on the worth of DC required by the system. The following modification will provisionally cause the opposite.
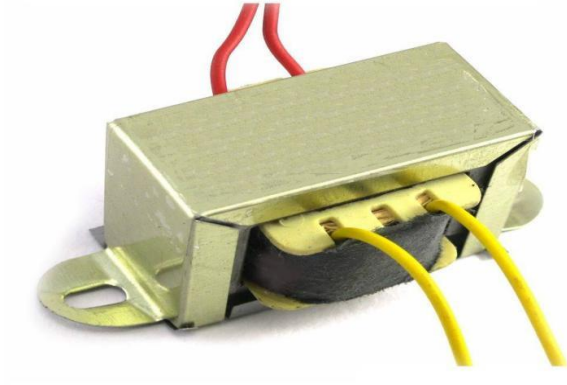

Figure 9: rectifier diagram

4.8 Filtering Unit:

Rectification of power supply is required while providing the voltage supply to any system. While providing voltage or power supply unit, rectification is achieved. Diode has the features which allow electron to flow in unidirectional way. When the AC supply is every day to the primary winding of the power transformer it can be change the state of supply either in stepped down condition or step up condition contingent on the worth of DC required by the system. The following modification will provisionally cause the opposite.

4.9 Voltage Regulator:

The voltage regulators has an important role in any power supply unit. The persistence of using regulator is providing aid and the rectifies. it provides voltage to the system directly and constantly which keep system active for a long time. Power supply for a system without using regulator is like keeping system in danger because while the voltage get up and down, there is chance of getting the system destroyed. In this project we have provided the supply of +12V and +5V supply.
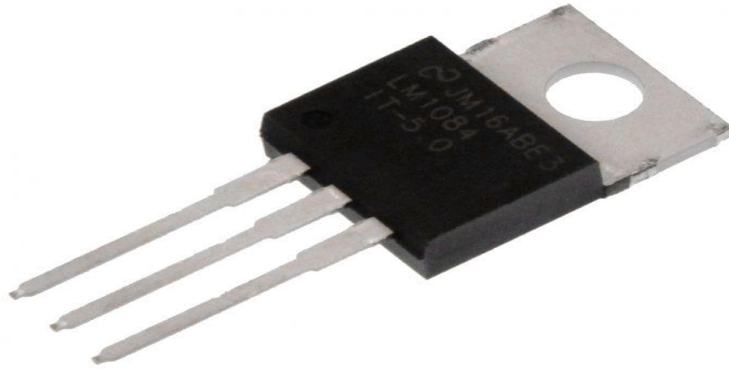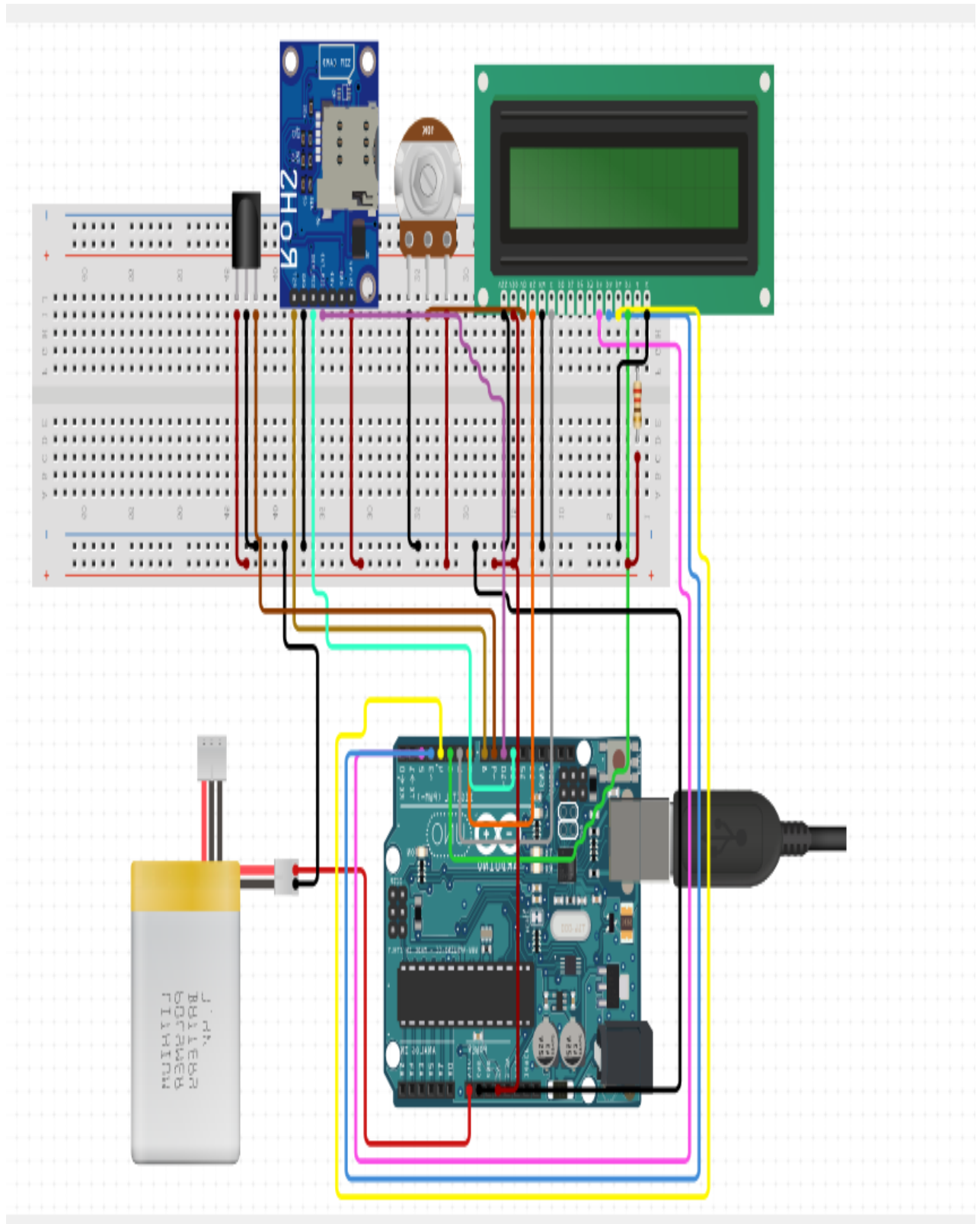
Figure 10: Voltage Regulator

Figure 11: Circuit Diagram of proposed system

5.1 INTRODUCTION TO KEIL SOFTWARE:

The Keil Micro Vision software is an IDE used to form software which allow to run on embedded systems (like a microcontroller). This integrated development environment allows such type of software to run which is basically written in assembly language or high level like c language or java etc. this all software is simulated in micro-controller before using in the system by using this integrated development environment.

In this project we have used the third version of KIEL software which is **µVision3.** This version of integrated development environment helps us to write the code in required format and language, compile in required byte code, and burn or debug in the embedded programs. It consists the below mentioned components-

- A venture administrator.

- A making capability.

- Tool shape.

- Publishing supervisor.

- An influential debugger.

for creating a new venture in version uVision3:

1. Selecting Venture - New Venture.

2. Selecting a directory and then pass in the name of the venture file.

3. Selecting Venture –Hand-picked Device and first-rate a expedient from Expedient Database.

4. Creating basis files for adding to the venture

5. Selecting venture - Boards, Clusters, and Records. Add/Records, choice Basis Group1, and adding to the basis file of venture.

6. Selecting venture - Boards, Clusters, and Records. Add/Records, choice Basis Group1, and adding to the basis file of venture.

7. Selecting Project - Rebuilding all target files or Building target.

5.2 CODING FOR GSM MODULE IN ARDUINO:

The first coding part of our proposed system is connecting Arduino to GSM module for the transferring and receiving text from GSM sim and display it on LCD display. Code for this process is given below……

```
sketch_may17a §

void setup ()
{void setup ()
{
    Serial.Begin(9600); // used to Initialise serial and communicate with GSM Modem
}

void loop ()
{
    delay (10000); //this line Gives enough time for GSM to register on          Network
    SendSMS (); //this line is use to Send one SMS
    while (1) ;//use to Wait forever
}

void SendSMS ()
{
  Serial.println("AT+CMGF=1"); //To send SMS in Text Mode as received
  delay (1000);
  Serial.println("AT+CMGS=\"+9198xxxxxxxx\"\r"); // use to Change the destination phone number
  delay (1000);
  Serial.println("Hello from GSM Modem!") ;//use to contain the content of the message
  delay (200);
  Serial.println((char)26); //the stopping character Ctrl+Z
  delay (1000);

    Serial.Begin(9600); // used to Initialise serial and communicate with GSM Modem
}

void loop ()
{
```

sketch_may17a §

```
Serial.println("AT+CMGF=1"); //To send SMS in Text Mode as received
delay (1000);
Serial.println("AT+CMGS=\"+9198xxxxxxxx\"\r"); // use to Change the destination phone number
delay (1000);
Serial.println("Hello from GSM Modem!") ;//use to contain the content of the message
delay (200);
Serial.println((char)26); //the stopping character Ctrl+Z
delay (1000);

   Serial.Begin(9600); // used to Initialise serial and communicate with GSM Modem
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void loop ()
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void SendSMS ()
{
  Serial.println("AT+CMGF=1"); //To send SMS in Text Mode as received
  delay (1000);
  Serial.println("AT+CMGS=\"+9198xxxxxxxx\"\r"); // use to Change the destination phone number
  delay (1000);
  Serial.println("Hello from GSM Modem!") ;//use to contain the content of the message
  delay (200);
  Serial.println((char)26); //the stopping character Ctrl+Z
  delay (1000);
```

5.3 code for connecting Arduino to database:

The second part of coding of our proposed system is connecting database to Arduino so that it can store text for history and reusability. The code has been shown below………

```
sketch_may17b §

#include <SPI.h>
#include <Ethernet.h>

byte mac [] = {
  0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED};

// Enter the IP address for Arduino, as mentioned we will use 192.168.0.16
// Be careful to use, instead of. when you enter the address here
IP Address ip (192,168,0,16);

int photocellPin = 0; // Analog input pin on Arduino we connected the SIG pin from sensor
int photocell Reading; // Here we will place our reading

// Initialize the Ethernet server library
EthernetServer server (80);

void setup () {

 // Serial.begin starts the serial connection between computer and Arduino
 Serial.begin(9600);

 // start the Ethernet connection and the server:
 Ethernet.begin(mac, ip);
 server.begin();
 Serial.print("Arduino server IP address: ");
 Serial.println(Ethernet.localIP());
}

void loop () {
```

```
sketch_may17b §

void loop () {


  photocellReading = analogRead(photocellPin); // Fill the sensorReading with the information from sensor

  EthernetClient client = server.available(); // Listen for incoming clients

  if (client) {

   // When a client sends a request to a webserver, that request ends with a blank line
    boolean currentLineIsBlank = true;
    while (client.connected()) {
      if (client.available()) {
        char c = client.read();

        // This line is used to send communication information between Arduino and your browser over Serial Monitor
        Serial.write(c);

        // When the request has ended send the client a reply
        if (c == '\n' && currentLineIsBlank) {

          // We send the HTTP response code to the client so it knows that we will send him HTML data
          // and to refresh the webpage every 5 seconds
          client.println("HTTP/1.1 200 OK");
          client.println("Content-Type: text/html");
          client.println("Connection: close");
          client.println("Refresh: 5");
          client.println();
```

```
        // Here we write HTML data (for the page itself) which will be sent to the client.
        // The HTML includes Javascript which fills the data
        client.println("<!DOCTYPE HTML>");
        client.println("<html>");
        client.println("<head>");
        client.println("<title>Arduino sensor data</title>");
        client.println("<script>");
        client.println("window.onload=function rfsh() {");
        client.println("document.getElementById('value').innerHTML =");
        client.print (photocellReading);
        client.println(";}");
        client.println("</script>");
        client.println("</head>");
        client.println("<body>");
        client.println("<br>");
        client.println("<h1>Light measured from the sensor is:</h1> ");
        client.println("<p id='value'></p>");
        client.println("</body>");
        client.println("</html>");
        break;
      }
      if (c == '\n') {
        // Check if a new line is started
        currentLineIsBlank = true;
      }
      else if (c! = '\r') {
        // If a new line was not strated
        currentLineIsBlank = false;
      }
```

```
        currentLineIsBlank = true;
      }
      else if (c! = '\r') {
        // If a new line was not strated
        currentLineIsBlank = false;
      }
    }
  }
  // Give the client some time to recieve the data (1ms)
  delay(100);
  client.stop();
  }
}
```
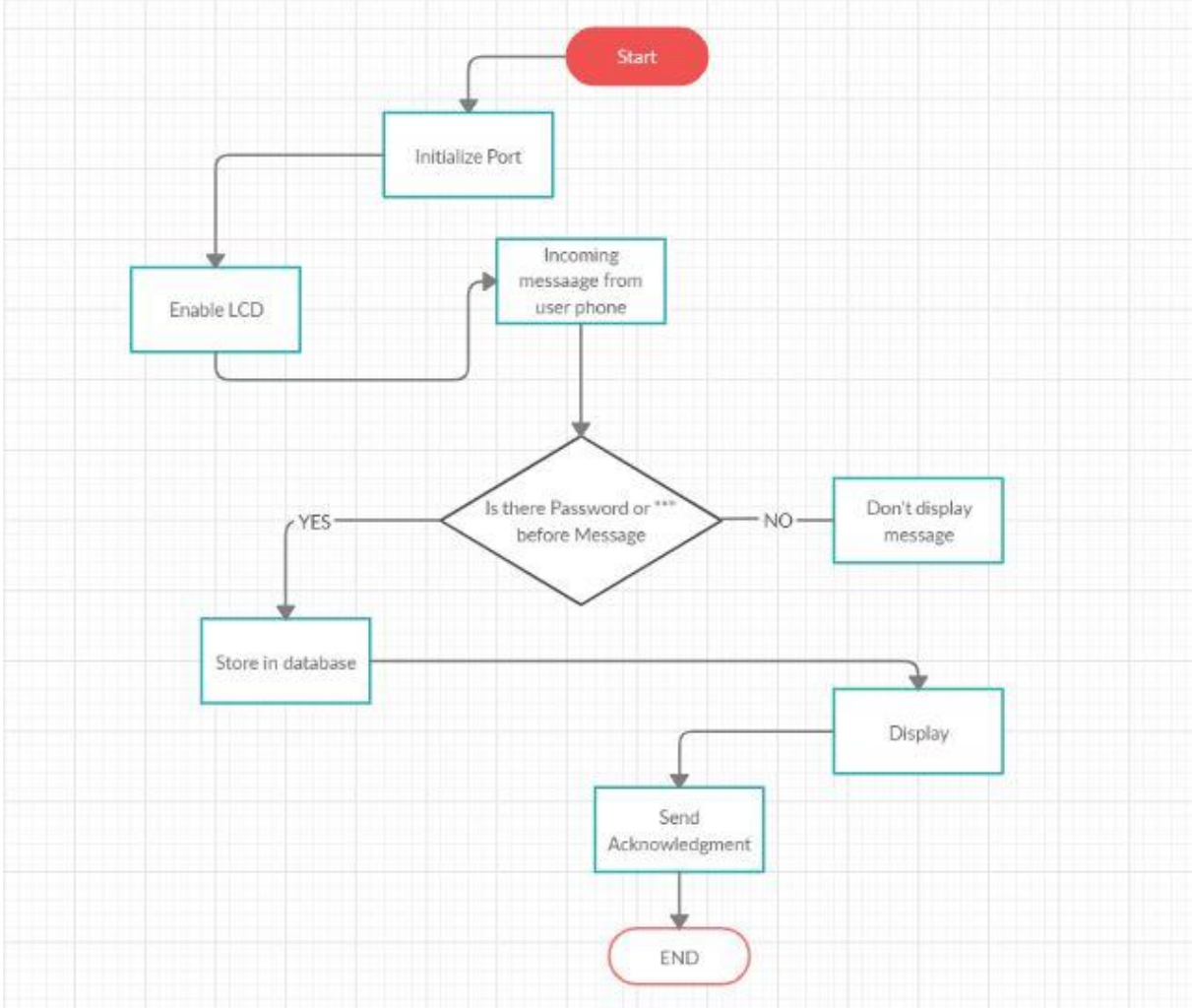
5.4 FLOWCHART:

Our proposed system will help people to display message easily. If we discuss about the future implication, then it can be used for multiple purpose as discussed above. This system will be also helpful in digital classroom, controlling devices by showing their functionality to the user.

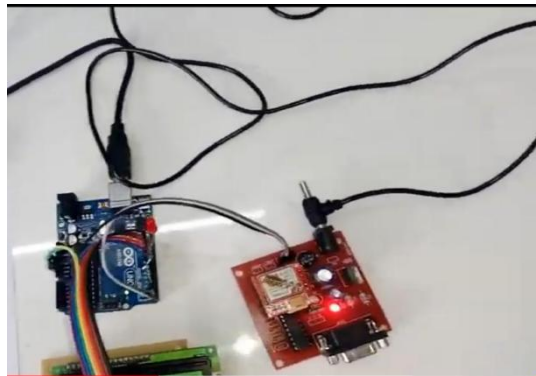## 6.1 Connected diagram of Arduino and GSM module-

Figure 13: connection diagram of system

In the above figure (Fig:13) we have shown the final connection diagram of Arduino uno and GSM module. In this connection the 5V supply is given to operate. It is basically the first step of our proposed system.

6.2 Typing message via phone-

In the below figure (fig: 14) the step one of the systems is performed where any random 10 digits are sent using *(star) at both the end. This action is performed using another GSM sim card in which the SIM inserted into GSM module's number is saved.
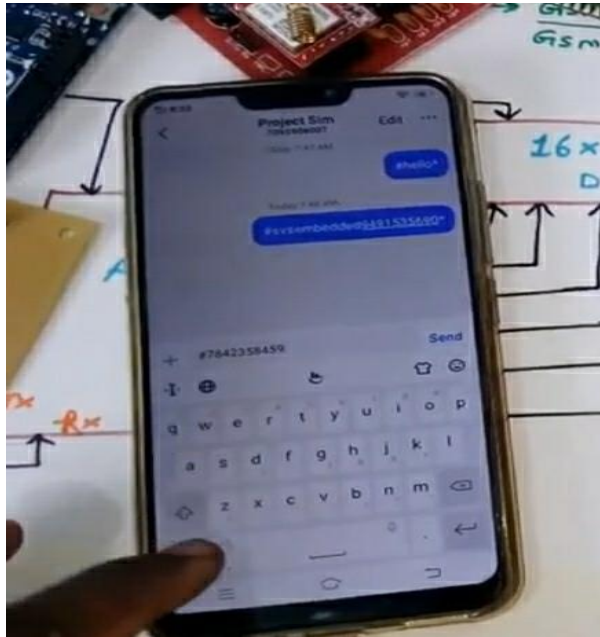
6.3 Storing text on database-
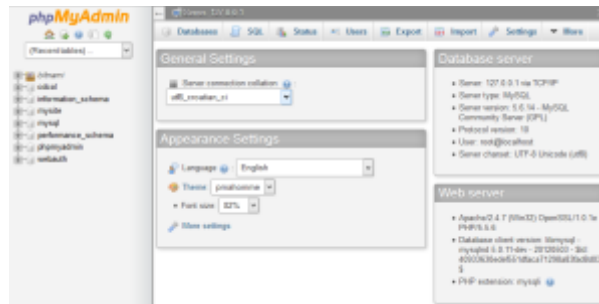
In this way (fig 15) we will store data on database for history purpose and reusability.

6.4 Receiving text on LCD display-

When the text is sent from the phone and received by GSM module then first it will show that "message received" which is immediately get stored on database as per fig 16.

6.5 Showing message on LCD –

Last action (fig 17) was performed by LCD display which display the data received by GSM module. In this way our proposed system hardly takes 0.1 sec to show the data on display. If we compare our proposed system to the old traditional method that is paper method, it is thousand time faster than old traditional method and also saved money.

CONCLUSION:

The proposed system accepts the message via SMS or google assistant or application, stores it in database for history and reusability. The LCD display is used to display the text or image or video. It is basically aimed at the colleges, university and public places like bus station and railway station for displaying essential data in fast way. It is very easy to use. The proposed system is very easy to operate and can be applied in many future technologies. This proposed system could be also helpful in artificial intelligence and machine learning. In upcoming days each person wants to save their time and money both, so this system is going to work for them in much efficient way. It is also easy to use so we don't need any proper training to use this system.

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