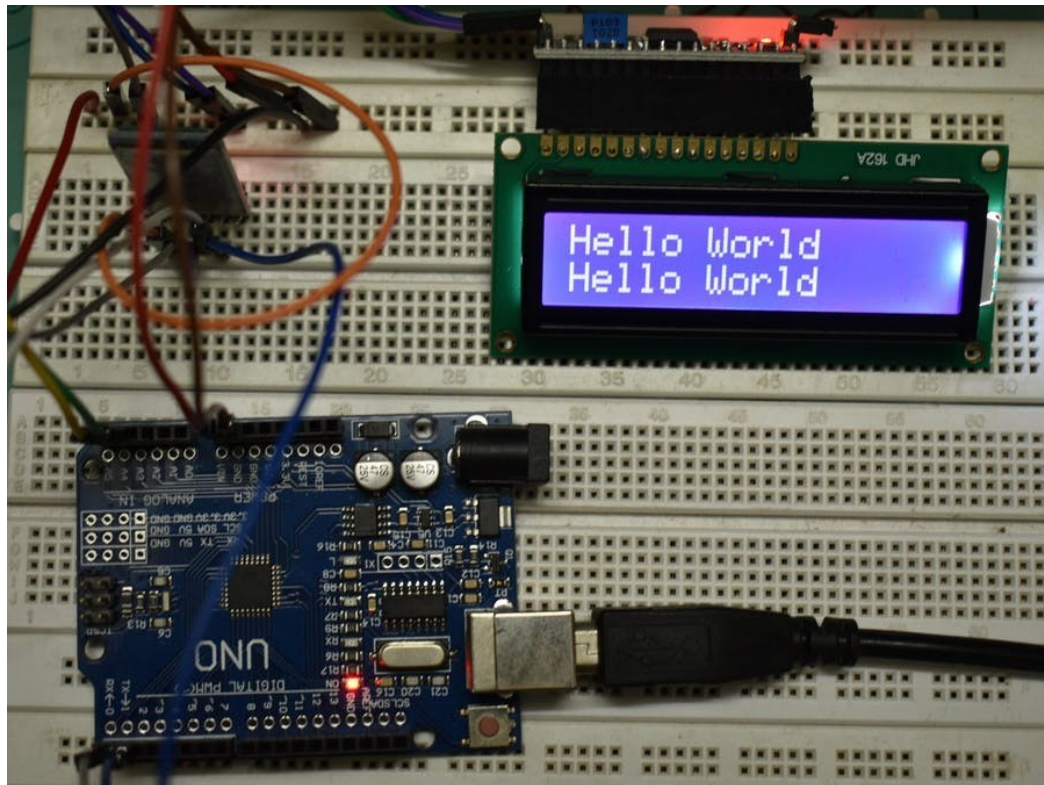


Arduino Based Wireless Notice Board using Bluetooth



Introduction

In this world Mobile Phones and the related technologies are becoming more and more prevalent. Various technical arenas in the field of Telecommunication and Embedded Systems are becoming omnipresent in the people. The use of cell phones has rapidly increased over the last decade and a half upgradation in networking technologies has encouraged the development and growth of very dense networks. Now-a-days the general mass prefer communicating while on the move therefore landlines usage has been drastically reduced. Notice boards are one of the widely used ones ranging from primary schools to major organizations to convey messages at large. Small innovative steps in making use of technology for regular purposes would have an adverse effect on the environment issues which we are presently concerned about.

The main aim of this project is to design a SMS driven automatic display Board which can replace the currently used programmable electronic display and conventional notice boards. It is proposed to design to receive message in display toolkit which can be used from an authorized mobile phone. The whole process can be described from the transmitter and receiver section. The BLUETOOTH module receives a message from the authorized mobile phone and the message is extracted by the microcontroller from the BLUETOOTH module and is displayed on the LCD display board. This proposed system in this paper has many upcoming applications in educational institutions and organizations, crime prevention, traffic management, railways, advertisements etc. Been user friendly, long range and faster means of conveying information are major bolsters for this application. By using this proposed methodology, we can enhance the security system and also make awareness of the emergency situations and avoid many dangers.

Problem Statement

A lot of paper has been used and is later wasted by the organizations which leads to a lot of deforestation thus leading to global warming and notice is an indispensable requirement for public places and organizations to connect or communicate with people in one way or both. , A wireless electronic notice board system can be easily realized by using any of the low power consuming wireless technologies (like Wi-Fi, Bluetooth, RF, XBEE, GSM) replacing the need of paper notice board.

Objective

Our objective is to develop a wireless notice board that displays notices and the project is based on the HC-05 Bluetooth module, controlling LCD displays using an android application.

Architecture

Components:

1. Breadboard.
2. HC-05 Bluetooth module.
3. 16x2 LCD display
4. Arduino UNO or Nano.
5. Some wires.
6. 1K OHM Resistor
7. Mobile phone from Android.

Steps for the architectural setup:

1. Connect the LCD with the breakout board ; if used for better connections.
2. Connect the Bluetooth with the Arduino with the following connections.
 - a. Connect the TX of the arduino to the RX of the Bluetooth
 - b. Connect the RX of the arduino to the TX of the Bluetooth
 - c. Connect VCC on arduino board to the +5v of the bluetooth as well as ground to ground.
3. Write the code for the LCD and arduino automation app.
Includes reading data from Arduino automation app and then embedding the code to display that piece of message on the LCD.
4. Switch on the Hardware.
After switching ON the hardware, note the led on the bluetooth blinks good and the LCD displays the title with a scrolling to the Left.
5. Open 'Arduino Bluetooth Control' app.
Install Arduino Bluetooth control app from playstore from the following link.
<https://play.google.com/store/apps/details?id=com....>
6. Display the message on the LCD.
Using the mobile app, type anything you want to display on the LCD.

Software

Arduino IDE is used for programming Arduino board. LCD's library (#include) is used, which is already available in the latest IDE's library. Here, the baud rate or speed of serial communication is set to 9600. For serial communication, inbuilt functions such as serial.begin(), serial.available() and serial.readString() are used.

Code

```
#include <LiquidCrystal.h>
#include <SoftwareSerial.h>
```

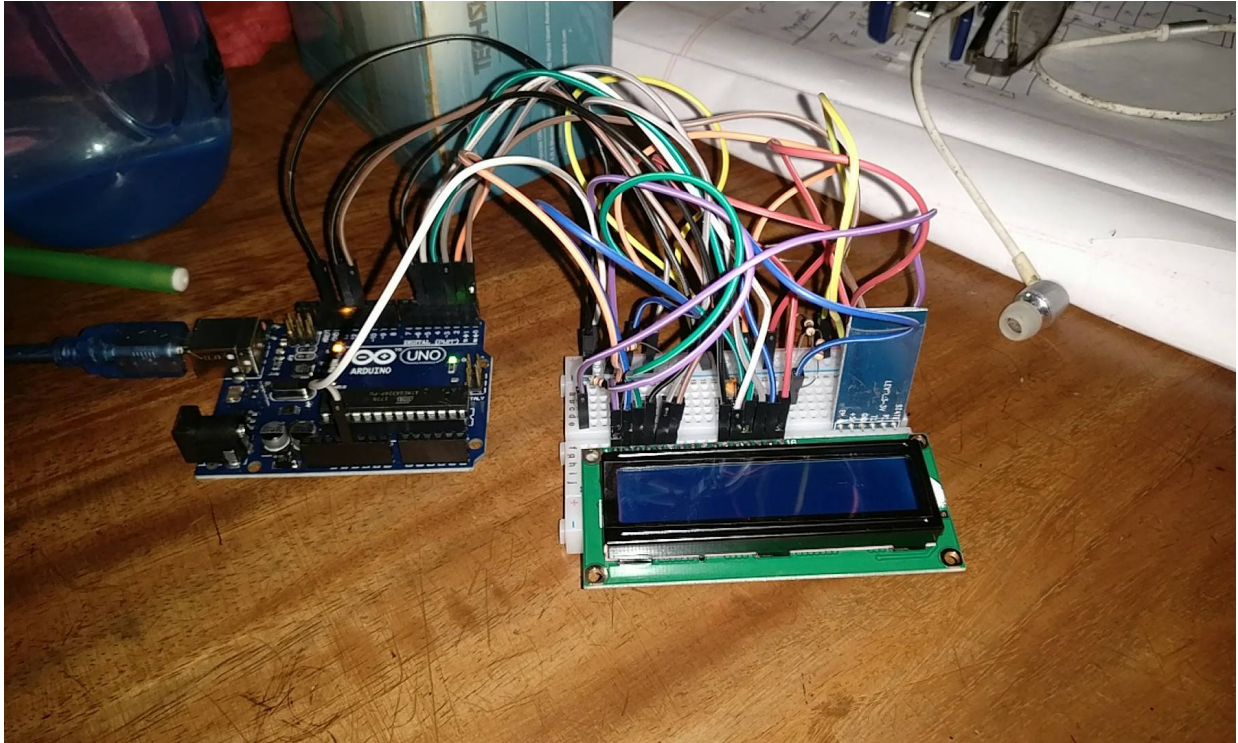
```
LiquidCrystal lcd (4, 5, 6, 7, 8, 9);  
SoftwareSerial mySerial (2, 3); //(RX, TX);
```

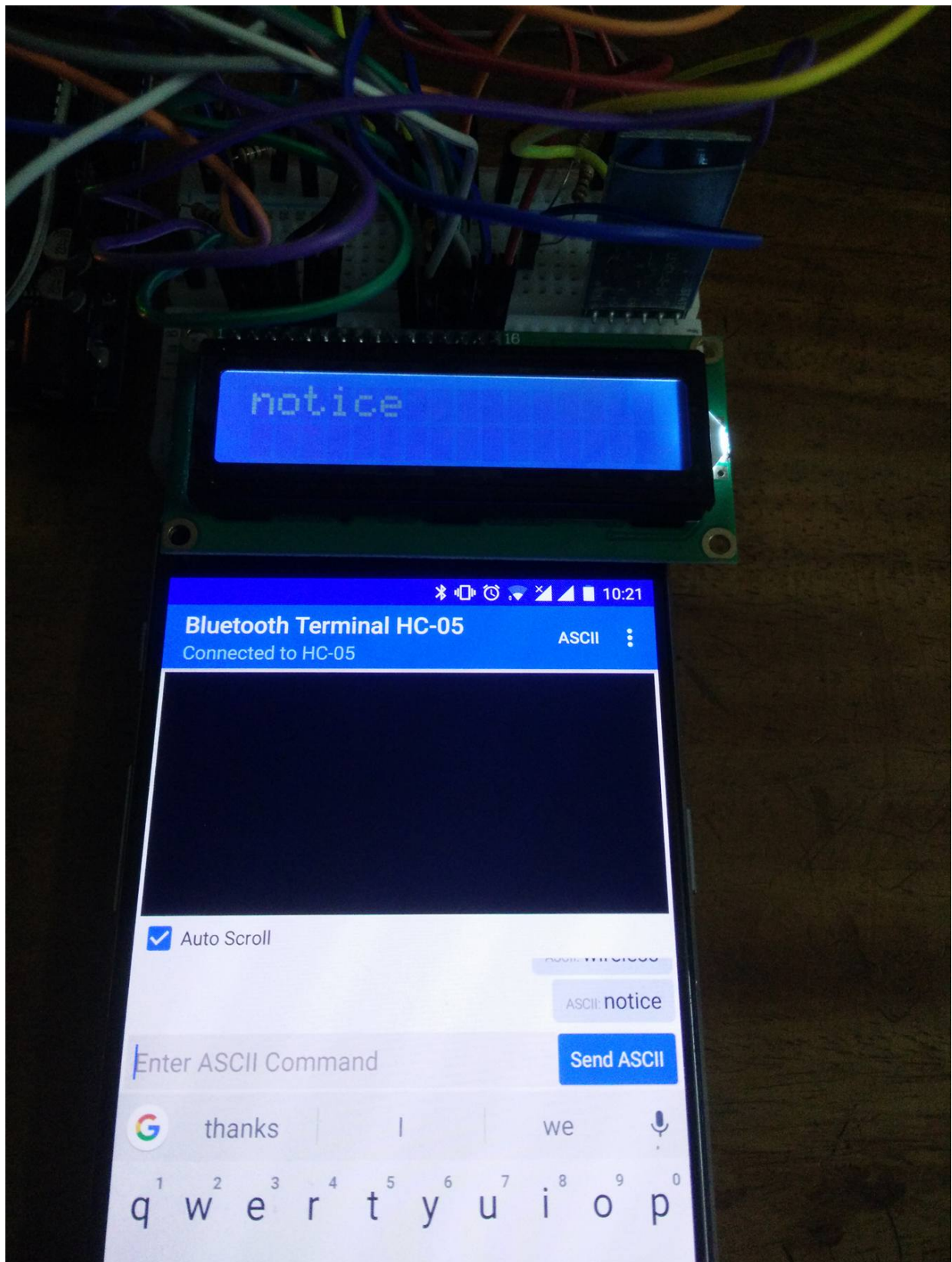
```
String val = "No Data";  
String oldval;  
String newval = "No Data";  
int i = 0;
```

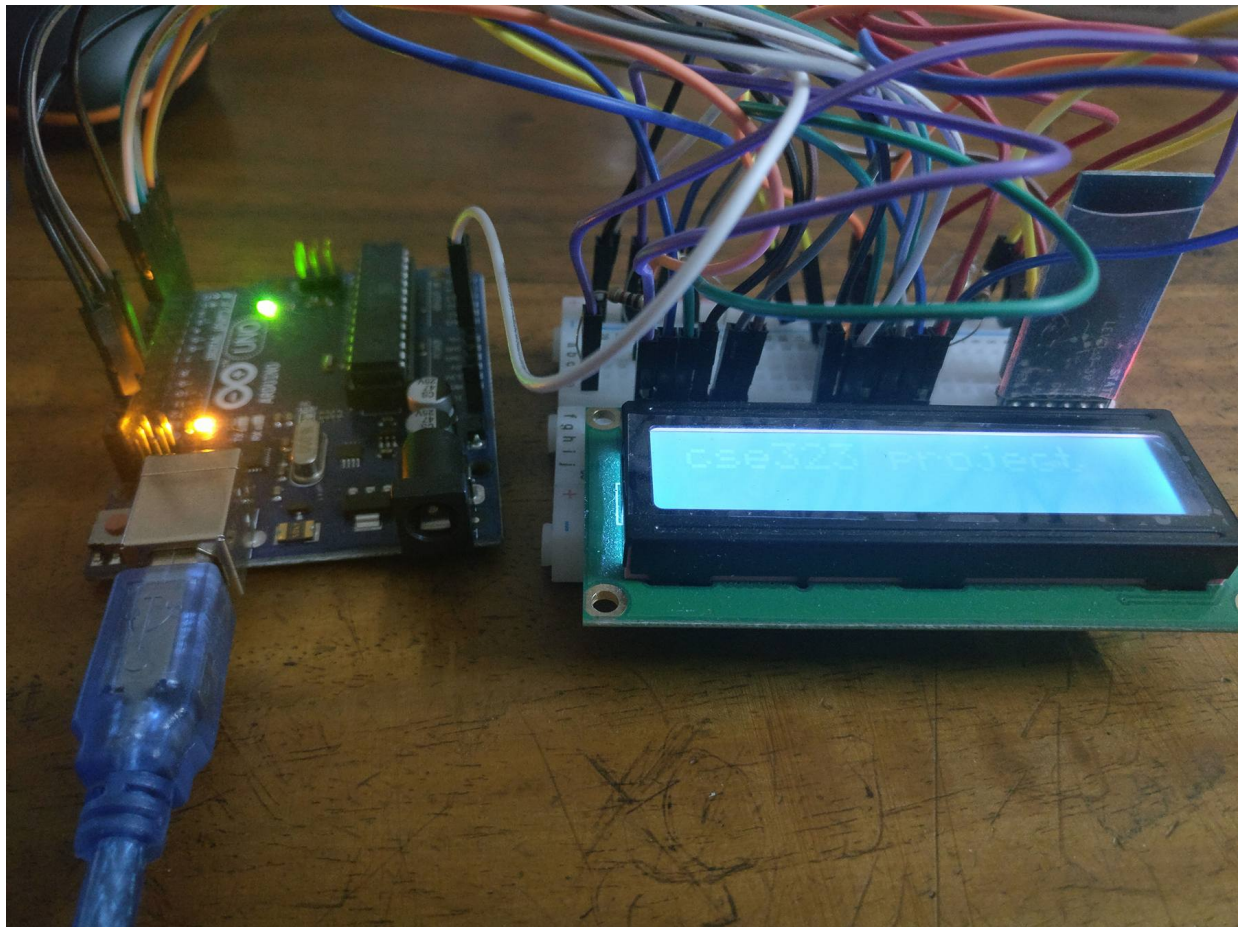
```
void setup()  
{  
  lcd.begin(16,2);  
  mySerial.begin(9600);  
  Serial.begin(9600);  
  lcd.setCursor(0, 0);  
  lcd.print("Wireless Notice");  
  lcd.setCursor(0, 1);  
  lcd.print("  Board  ");  
  delay(3000);  
  lcd.clear();  
  lcd.print("Welcome!");  
}
```

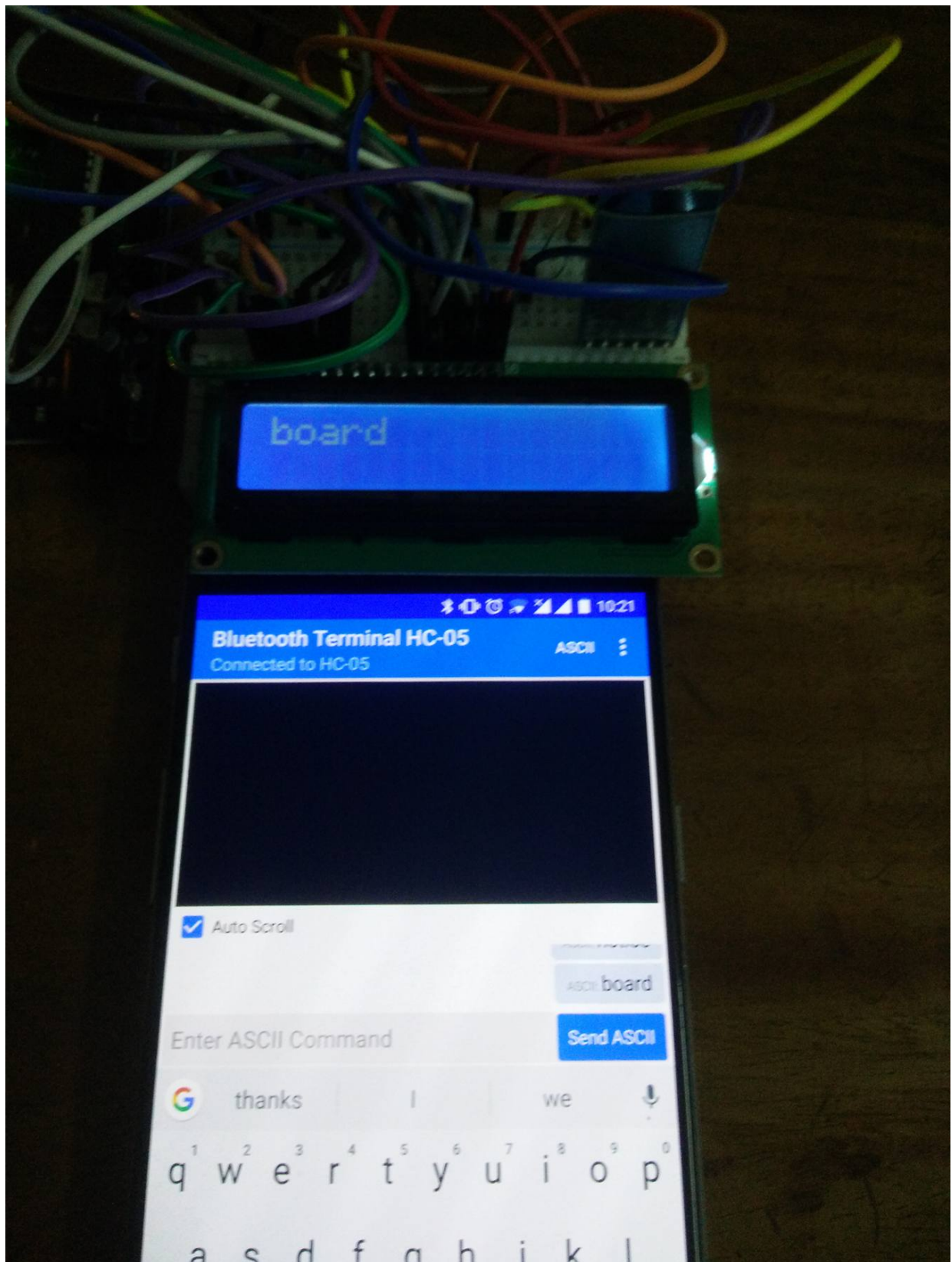
```
void loop()  
{  
  val = mySerial.readString();  
  val.trim();  
  Serial.println(val);  
  if(val != oldval)  
  {  
    newval = val;  
  }  
  lcd.clear();  
  lcd.setCursor(i, 0);  
  lcd.print(newval);  
  i++;  
  if(i >= 15)  
  {  
    i = 0;  
  }  
  val = oldval;  
}
```

Output

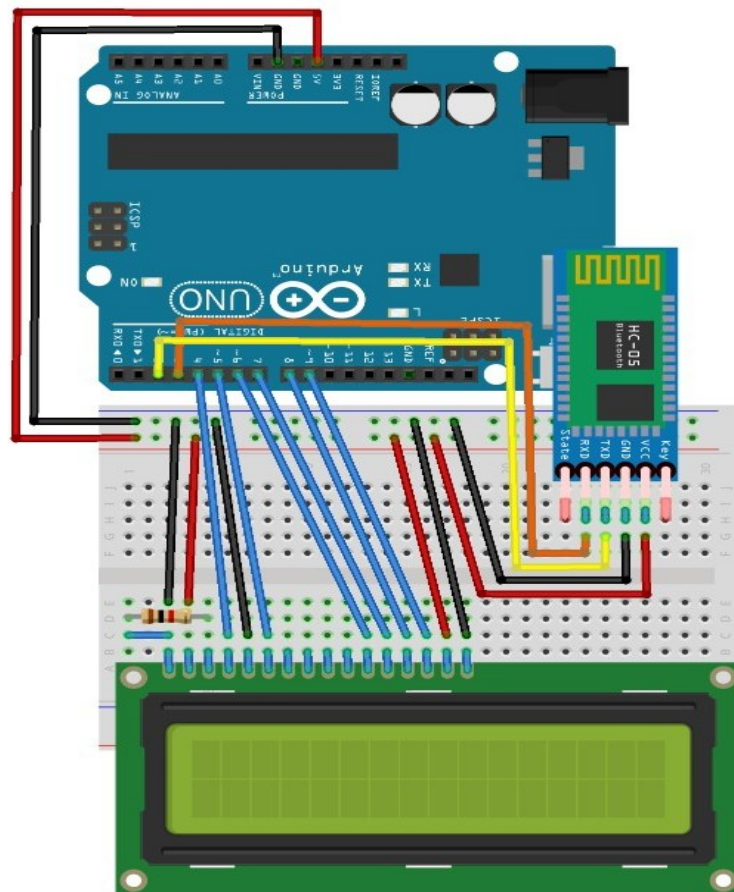








Diagram



Working

This wireless LCD display shows information sent from a smartphone. The user can send text messages with up to 32 alphanumeric characters to the LCD within Bluetooth range of about few metres. In this Project the App from the phone sends bluetooth packets to the Bluetooth module of arduino, after pairing with it. Since Bluetooth is a wireless connection the notice board can be easily updated just by typing in and sending a message in the format “*<MESSAGE>#”. The phone will form bluetooth packets and send it to the bluetooth module where it will be read by the arduino and the code will execute to display the message that was sent on the LCD, the Message will be scrolling from right to left continuously so longer texts can also be shown on the screen.

Project extension and implementation in other ways

1. Educational organizations' (schools and colleges). To inform any changes in the timetable or important information
2. Hospitals. To inform a doctor's name and her or his department

3. Restaurants. To inform the kitchen staff
4. Offices. To inform the status (busy, available, out of the office, etc.) of the boss inside the office

References

1. <https://www.ijert.org/research/wireless-e-notice-board-using-bluetooth-technology-IJERTCONV6IS07092.pdf>
2. https://create.arduino.cc/projecthub/Ramesh_Dofbot/arduino-based-wireless-notice-board-using-bluetooth-360189
3. <https://www.ijeat.org/wp-content/uploads/papers/v10i1/A17761010120.pdf>
4. <https://www.instructables.com/Wireless-Notice-Board-Bluetooth/>
5. https://www.researchgate.net/publication/304230445_Small_and_medium_range_wireless_electronic_notice_board_using_Bluetooth_and_ZigBee