Project Title :

Wireless Notice Board Using Bluetooth and Arduino

Introduction :

- In this proposed project, the development of a simple and low cost wireless android based notice board is presented.
- The proposed system uses either Bluetooth or wi-fi bases wireless serial data communication in displaying messages on a remote digital notice board.
- Android based Application programs available for Bluetooth and wi-fi communication for personal digital assistant (PDA) devices are used for transmitting the alpha numeric text messages.
- Using the Bluetooth based serial data communication technique, the corresponding transceiver module has been interfaced with microcontroller board at the receiver end .

- For this purpose, a low cost microcontroller board(Arduino Uno) is programmed to receive alphanumeric text messages in any of the above selected communication modes.
  The development of cellular network in the 1970's for increasing the lack of frequencies in the radiotelephone services which in turn lead to introduction of AMPS(Advanced Mobile Phone System) where the transmission was Analog based . This was to be the first generation in cellular networks .
  The second generation was based on digital transmission and was called with various abbreviations as GSM(global system for Mobile communications), ERMES(European Radio Messaging Systems) .

- The third generation has risen with the unification of different technologies ; some of them which are popularly known are FPLMTS(Future Public Land Mobile Telecommunications System), UMTS(Universal Mobile Telecommunication System), thus these days , BLUETOOTH technology has become one of the most popular medium for wireless data transfer. It has a wide range and is efficient in its work.

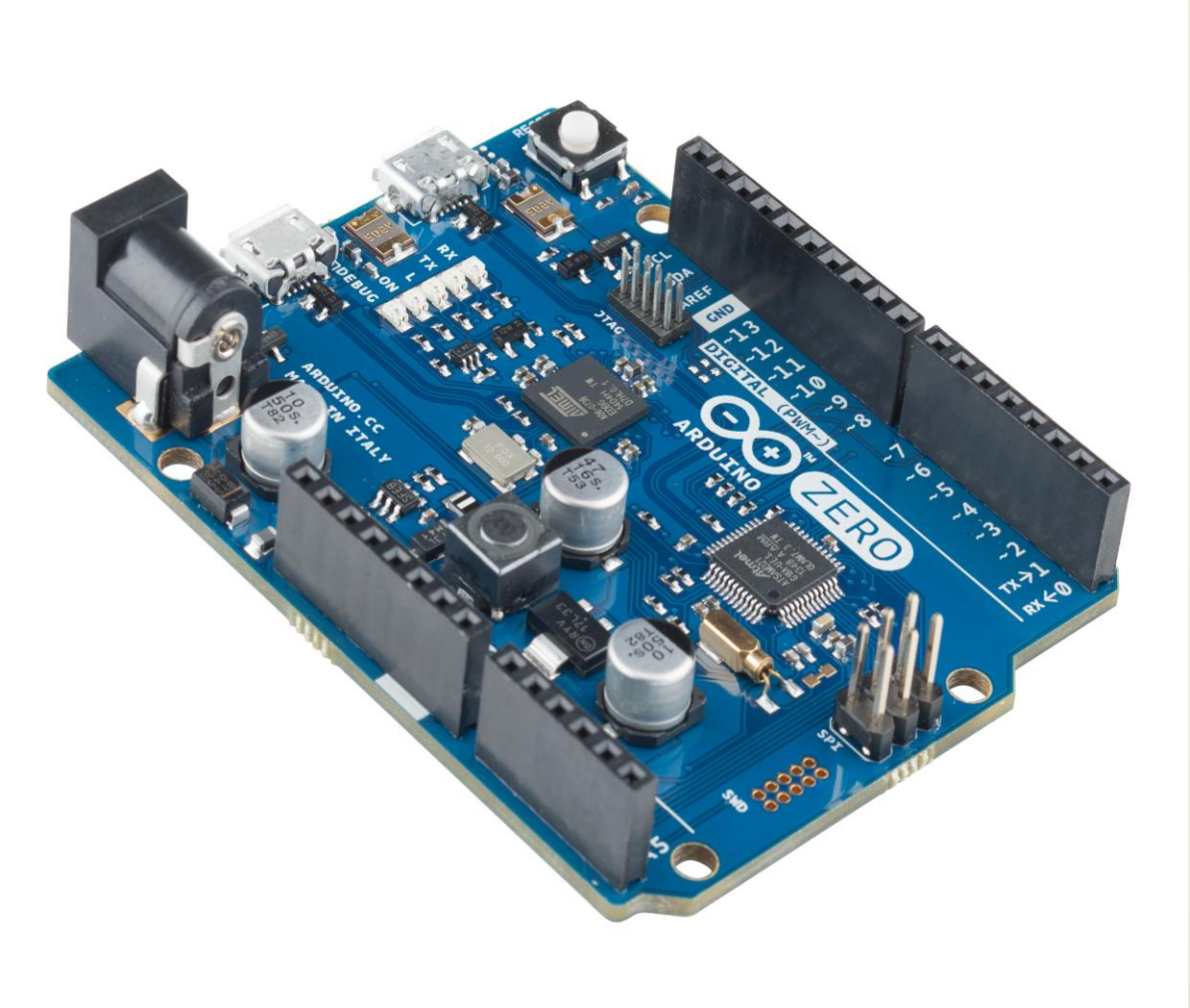
Components required :

- Hardware requirements :
- Arduino UNO
- LCD 16*2
- HC-05 Bluetooth Module
- Breadboard
- Jumper Wire

❖ Software requirements :

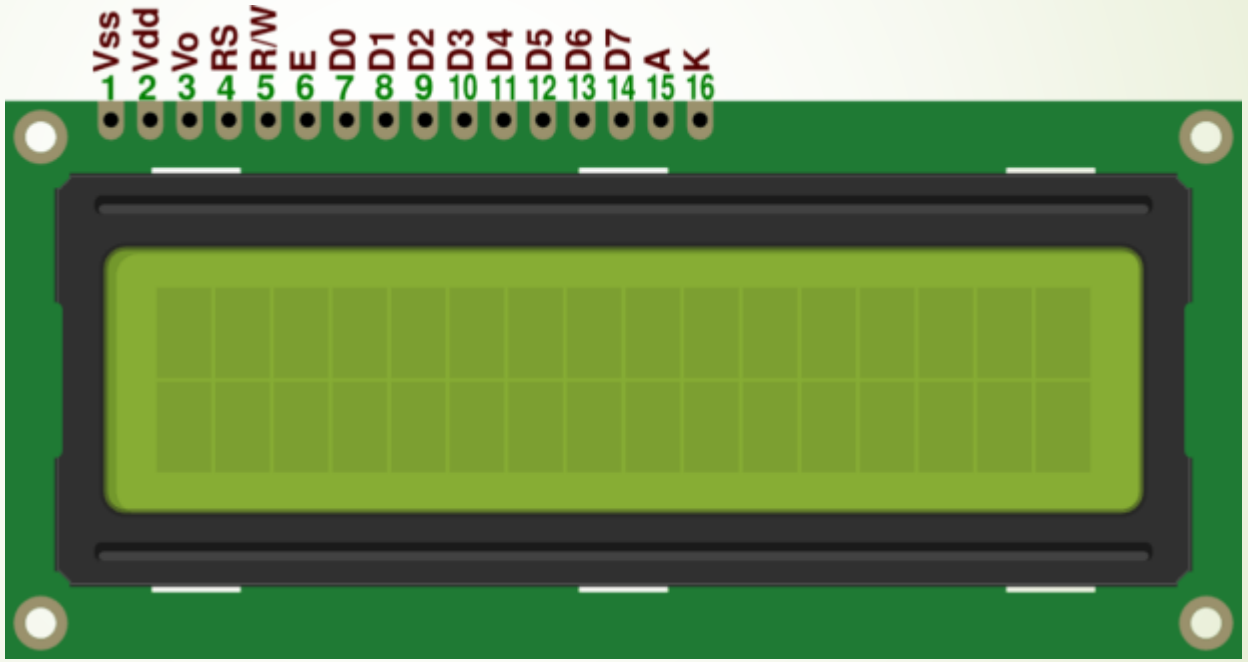
- Arduino IDE
- Arduino automation

Arduino UNO :



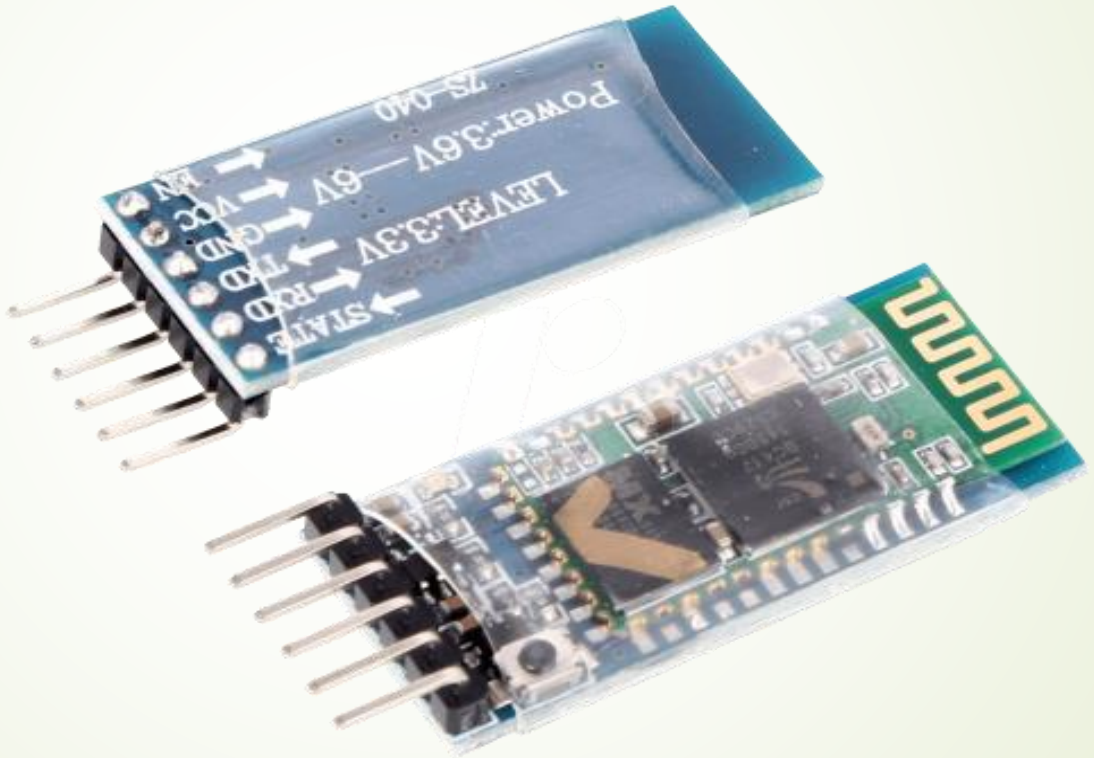
Arduino board is the heart of our system . Entire functioning of system depends on this board. The Arduino uno is a AT mega 328p microcontroller board. This board has 14 input/output pins (6 as a PWM outputs), 6 Analog inputs , a 16 MHz crystal oscillator, a USB connection, a power jack , an ICSP header, and a reset button .

LCD 16*2 Display :



We utilize screen as display . LCD is utilized in a project to visualize the output of application . Liquid crystal displays (LCDs) have supplies which combine the properties of both liquids and crystals . With the liquid crystal material sand witched in between them , an LCD consists of two glass panels . The inner surface of the glass plates are covered with the transparent electrodes that identify the character, symbols or patterns to be displayed and the polymeric layers are present in between the electrodes and the liquid crystals, which makes the liquids crystal molecules for maintaining a defined direction angle .

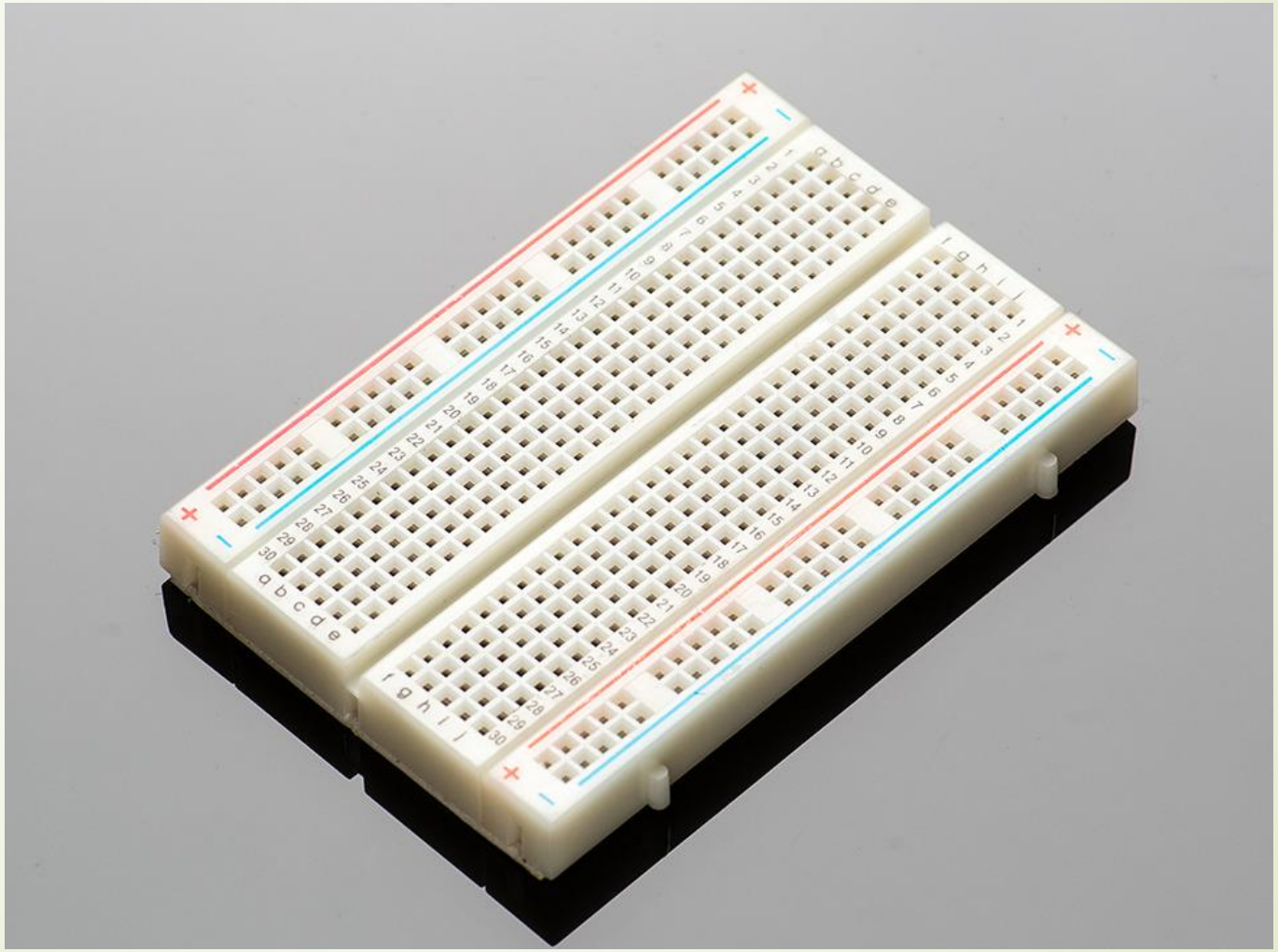
HC-05 Bluetooth module :



Bluetooth terminal is an Android application program that enables the android PDA's to communicate simply with a Bluetooth device via a terminal . Bluetooth terminal application program therefore enables the Android PDA to transmit or receive the messages in either hexadecimal (hex) or string format to the connected Bluetooth devices . At the receiver end, the HC-05 module is interfaced with microcontroller that is programmed to store the received message and display that to the LCD screen . The HC-05 is a very cool module which can add two-way (full duplex) wireless functionality . The Bluetooth module is used for transmitting data wirelessly from the transmitter to receiver .

The HC-05 module works on the same principle but on the different operation . TX pin- Transmitting pin – which is used to transmit the data . RX pin- the pin that receives data from the receiver . VCC pin – power supply pin . GND pin - power supply pin .

Breadboard :



A breadboard (sometimes called plug block) is used for building temporary circuits . It is useful to designers because it allows components to be removed and replaced easily . It is useful to the person who wants to build a circuit to demonstrate its action , then to reuse the components in another circuits .

Jumper wires :

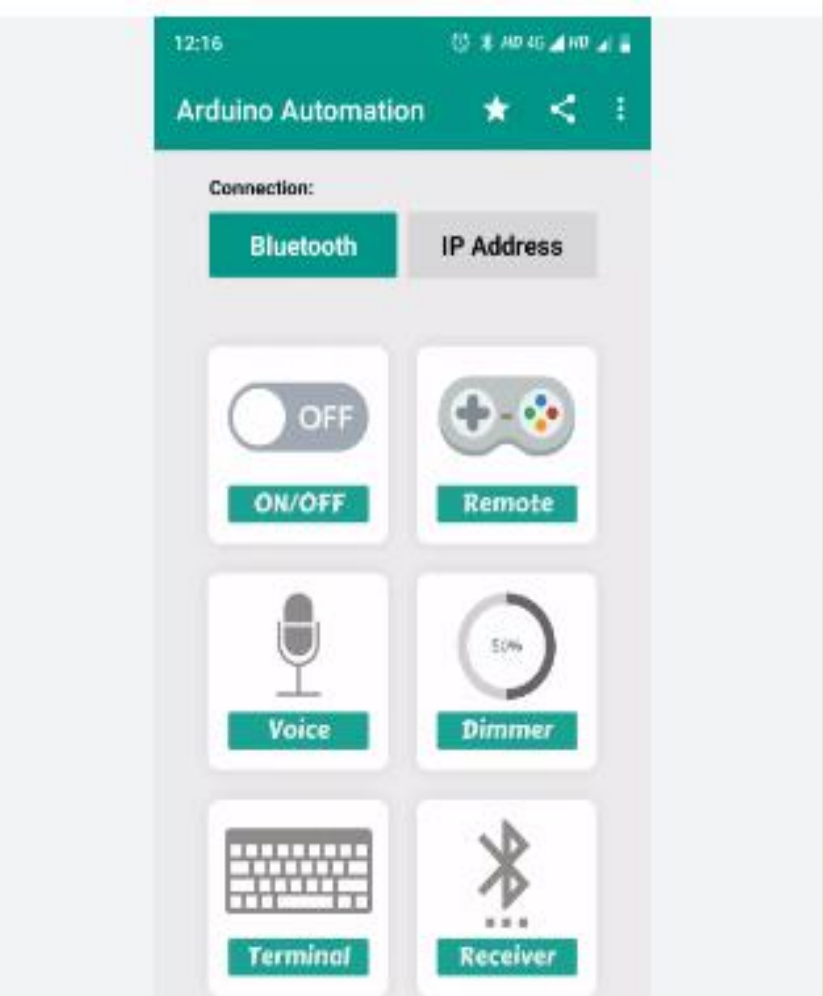
- A jump wire is an electrical wire , or group of them in a cable , with a connector or pin at Standard 22AWG jump wires with solid tips . Individual jump wires are fitted by inserting their “ end connectors” into the slots provided in a breadboard .

Software requirements :

Arduino IDE :

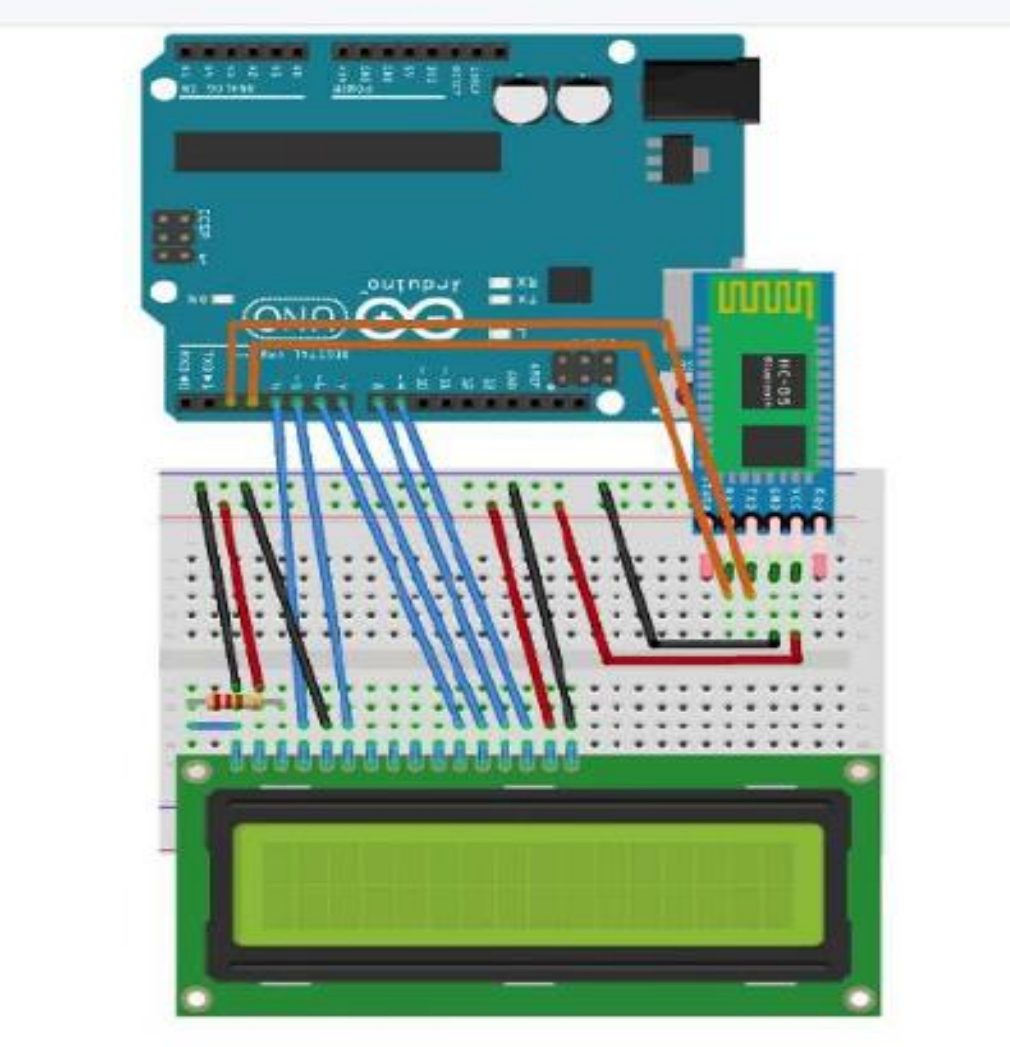
- Arduino is the required software environment to program the Arduino by writing a code and upload it to the Arduino . It also outputs the results for analysis using both serial monitor and serial plotter .
  It is an Arduino software , making code compilation too easy . It is available for all operating systems . MAC , windows , Linux and runs on the java platform that comes with inbuilt functions and commands that play a vital role in debugging , editing and compiling the code . It is easy to use , it supports all the Arduino boards , it has a built in library which is easy to use . The Arduino IDE is very user – friendly .

Arduino automation :



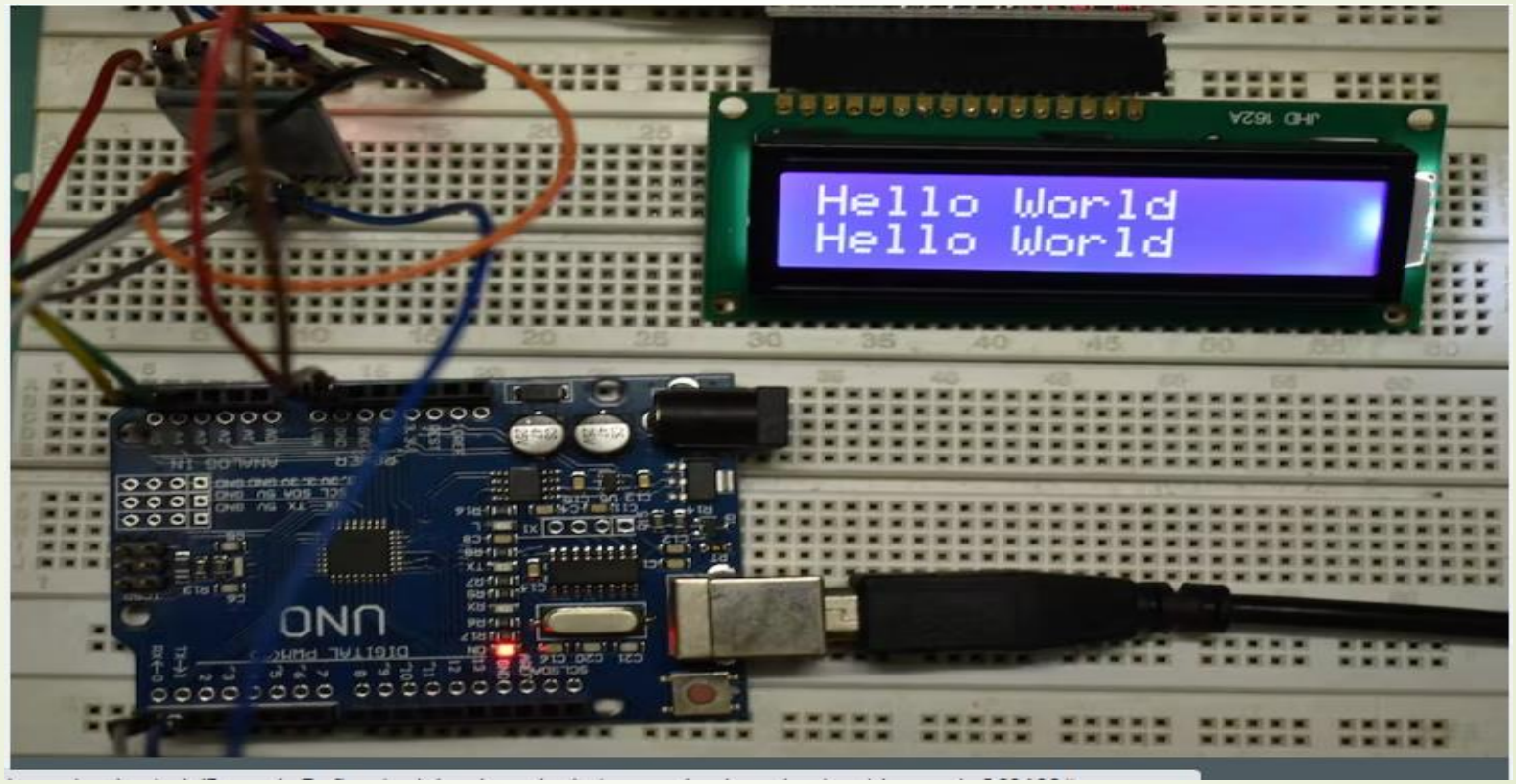
- It allows to control devices using your Arduino board (and similar boards) via Bluetooth .BT terminal is a terminal app with UART serial communication protocol that transmits and receives data wirelessly through Bluetooth connection . The app used for Robotics Communications , configuring Bluetooth modules (using AT commands), Home Automation….

Implementation details :



- As per the circuit diagrams we built the circuit connection . After that we upload the program in Arduino then all functions starts to run with program . After uploading the program , we will give the external power supply to the Arduino . Then we send message from mobile then this message will receive Bluetooth and displays on LED module .

Result :



- 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 matrix display board . Serial to parallel communication is used for the entire process from Bluetooth module to microcontroller and from microcontroller to the matrix display . And for the acknowledgement LCD display is used .

Applications :

- Traditionally , there were notice boards where any information or notice had to be stick daily . This becomes tedious and requires daily maintenance .
- This project overcomes this problem by introducing an electronic display notice board interfaced to an android device through Bluetooth connectivity.
- This proposed systems has many upcoming applications

In the educational institutions and organizations , traffic management , railways , advertisements,

Etc.

- Been user friendly , long range and faster means of conveying information are major bolsters for this applications . By using this proposed methodology we can enhance the security system and also make awareness of the emergency situations and avoid many danger .

Conclusion :

- As the technology is advancing every day the display board systems are moving from normal hand writing display to digital display . Further to wireless display units . This develops a photo type laboratory model wireless notice board systems with Arduino and Bluetooth connected to it, which displays the desired message of the user through an SMS in a most populated or crowded places .