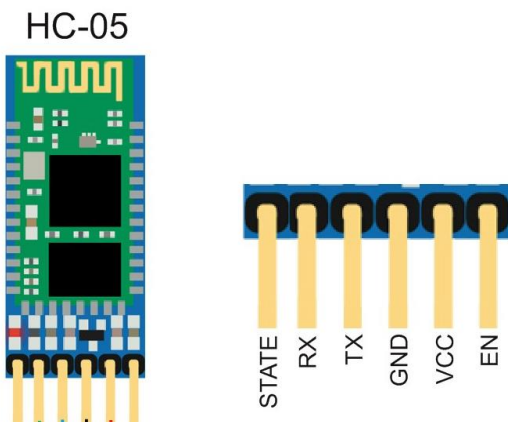


# Communication between an Arduino and a Smartphone

## Bluetooth Module for Arduino UNO:

We will be using the most common Bluetooth module for Arduino which is the HC-05 Bluetooth Module.



**Connect the PINs as:**

Arduino Pins	HC-05 Pins
<b>5 V</b>	<b>5V</b>
<b>GND</b>	<b>GND</b>
<b>9</b>	<b>TX</b>
<b>10</b>	<b>RX</b>

The RX pin is the receiving pin and the TX pin is the transmitting pin. Pin 9 of Arduino is acting like a RX pin or receiving pin so it is connected to the HC-05 transmitting pin while Pin 10 is acting like a transmitting pin so it is connected to the receiving pin of the HC-05.

## Connection Settings for new modules

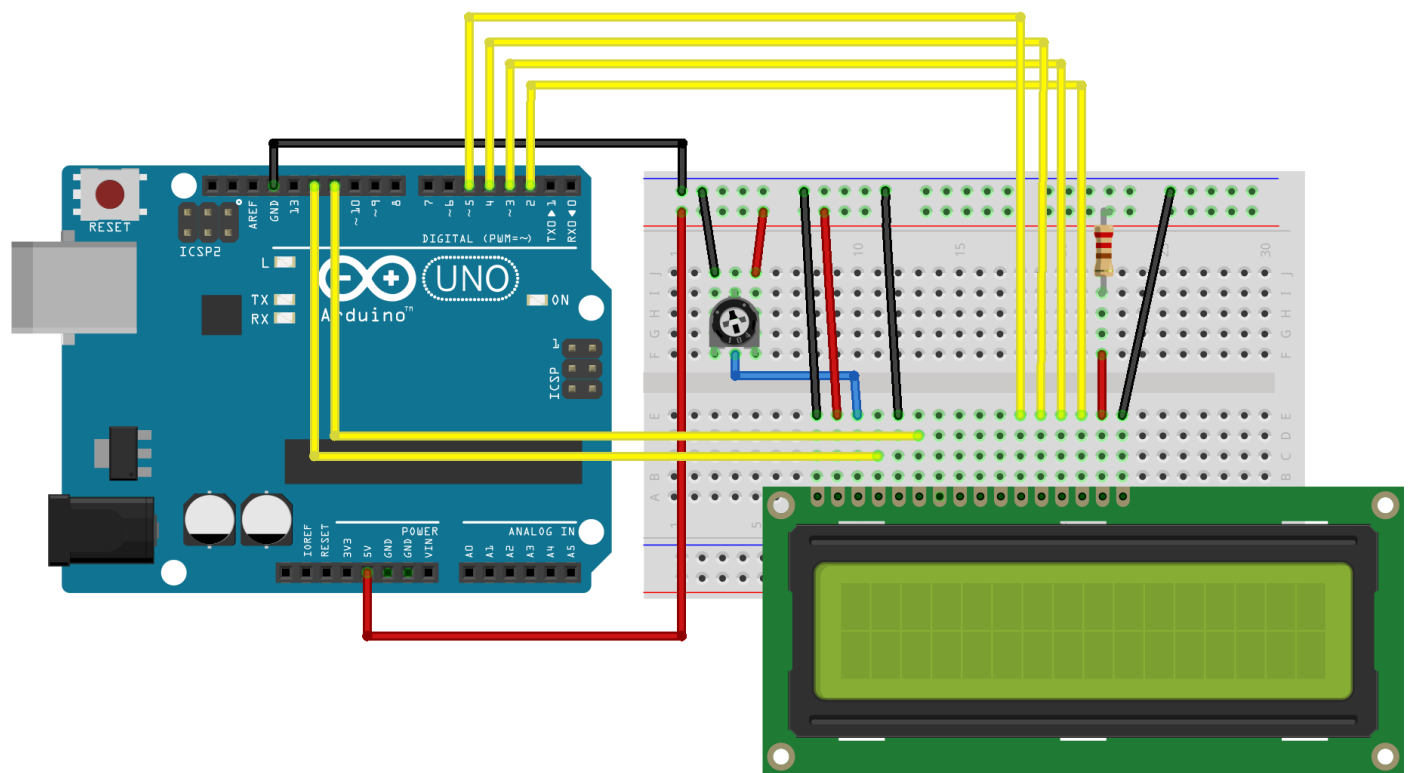
Name = HC-05

Password = 1234

Baud rate = 9600

### 16x2 LCD:

We will be using the 16x2 LCD with Arduino as it has a built in library for Arduino. The schematic of the LCD is shown below:

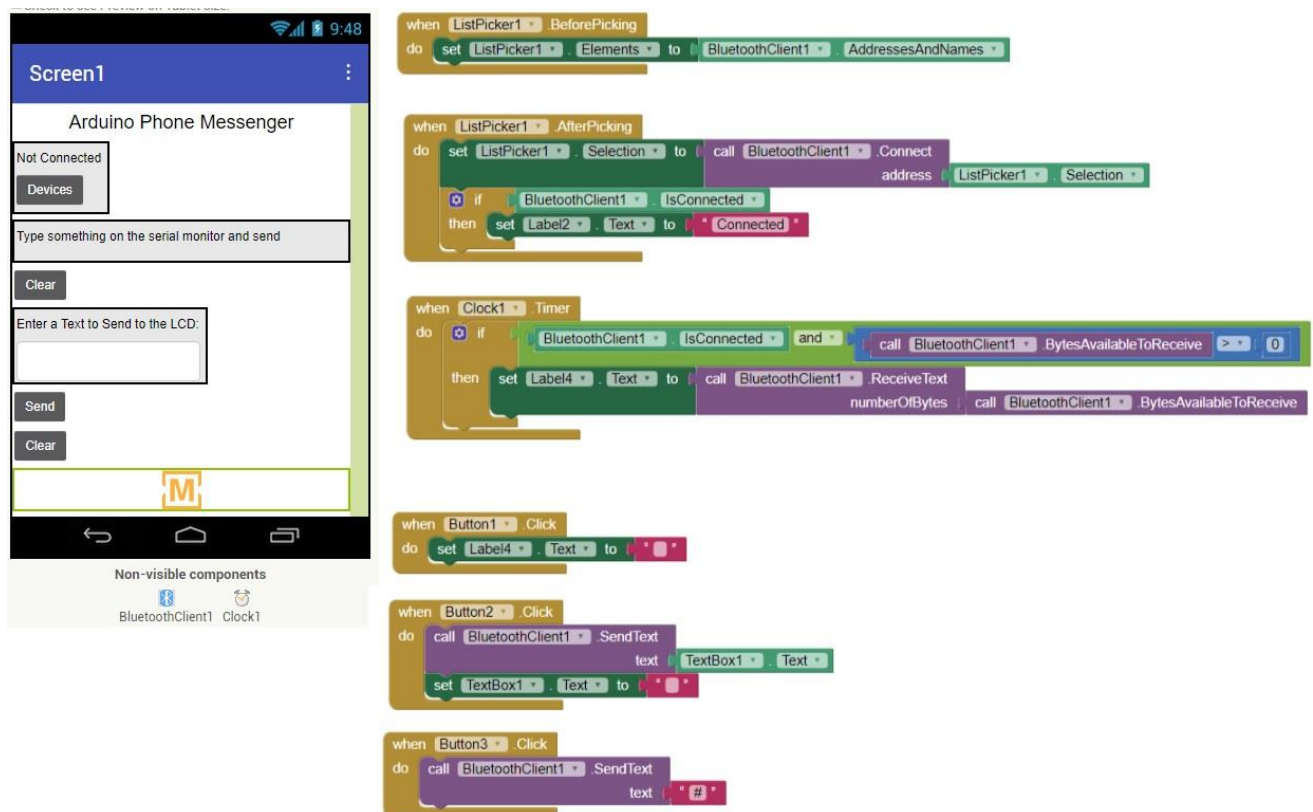


The potentiometer in the 3<sup>rd</sup> pin from the left is for controlling the contrast. Along with the LCD, also attach the Bluetooth module with the configuration as previously mentioned.

## MIT APP Inventor:

Now we will make the app that will be used to send text from a phone to the Arduino LCD and from the Arduino serial monitor to the Android application. MIT App Inventor is a free tool which allows for Android applications to be made. The programming is in blocks and is similar to that of Scratch.

The design of the app and programming is shown below:



The basic idea in the app is that first it will connect to the device and then whatever text you have typed; it will send that to the device. If you send a text from your Serial monitor, it will also receive that and print it on the app. Also when the clear

button is clicked to clear the LCD it will send the # character to the device. This will clear all of the text on the LCD.

**To get this app on your Android phone copy the APK file in the folder onto your phone and install it.**

### **Arduino Program:**

The Arduino program involves the use of a library SoftwareSerial.h. This library makes allows for serial communication to be done through the HC-05 module.

In the Arduino program, first the Arduino will read whatever is sent on the Serial monitor and then use the BTserial.print function to send it via the Bluetooth module to the phone. Next using BTserial.available, it will read whatever has been sent by the phone and it will print that on the LCD.

**Upload the program and test the application**