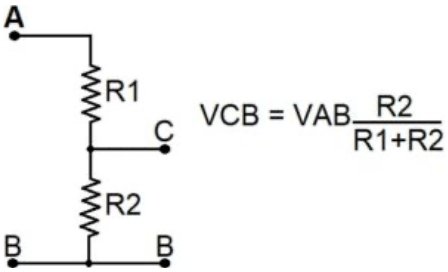
Configure Bluetooth Module HC-05 with AT Mode

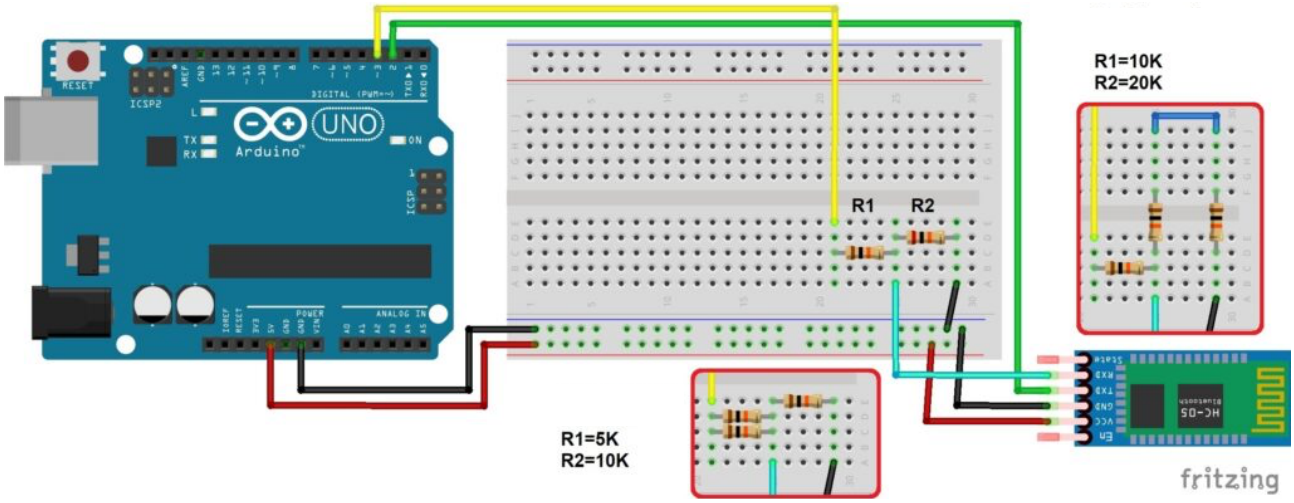
Introduction:

A widely available Bluetooth module HC-05 has capability to enable your project with BlueTooth. The HC-05 comes with a rich set of AT commands to perform various tasks, such as changing the module's default settings including changing the pass code and the device name. The HC-05 is a class 2 Bluetooth module (10m range). It is pre-configured as a slave Bluetooth device with Baud rate of 38400 (older version at 9600), 8 data bits, No Parity, 1 stop bit (8N1). Once it is paired to a master Bluetooth device such as PC, smart phones and tablet, its operation becomes transparent to the user.

HC-05 can be powered by 3.6V to 6V. Hence, it can be powered by Arduino's 5V supply. However, the level of RX/TX is 3.3V, which is not compatible with Arduino's digital output of 5V. For RX input, you need to use a voltage divider (formed by a 10KΩ and a 20KΩ resistors) to bring 5V down to 3.3V, in order not to risk damaging the module. In this way, the voltage level that will reach the Rx of the Bluetooth module will be approximately 3.33 V.



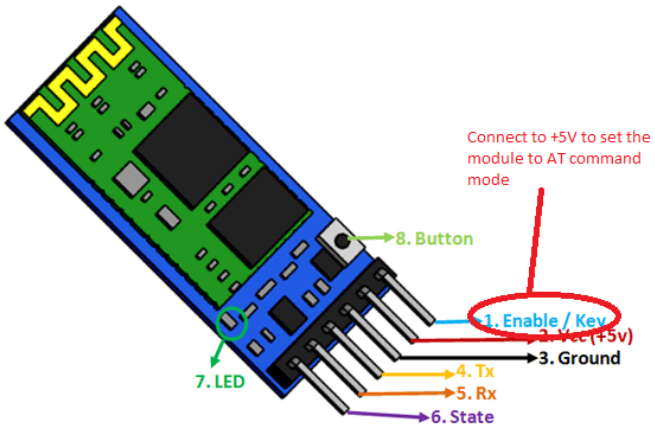
But the TX output of 3.3V can drive Arduino's digital input pin directly.



It has got one LED, which shows its state. If it is blinking that means it is not connected. If it is staying in glowing condition that means it is connected. There is a pin STATE that is connected to this state LED. You may use this pin in your project to determine the state of BT module.

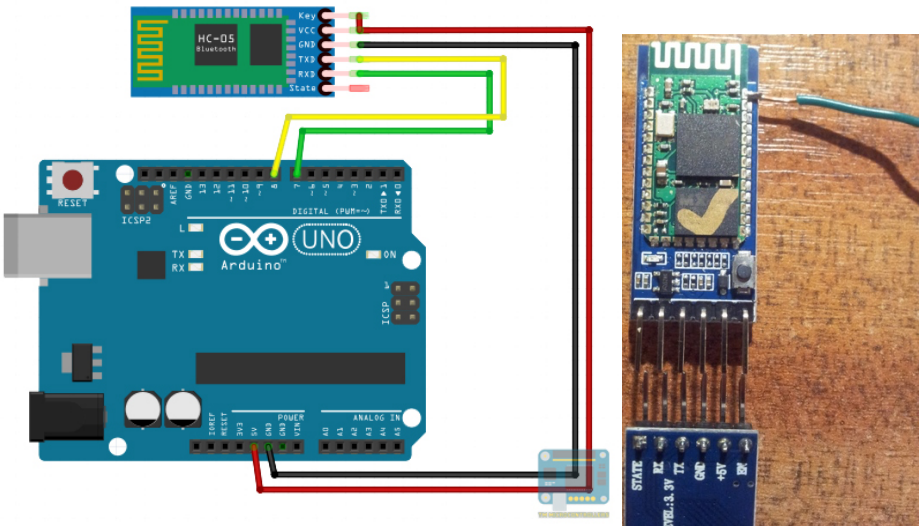
The HC-05 comes with a rich set of AT commands to perform various tasks such as changing the module's default settings including changing the pass code and the device name.

Configure with AT Mode:



After the connection, if you Plug the power source, you will see the HC-05 power on with a short rapid blink, which is the standard pairing mode of the module. By default, the HC-05 is configured in data mode, and in this mode, the module acts like a serial bridge. To put into AT command mode the KEY pin must be set (high), or you need to plug the power source while holding down the reset button on the module (the button is internally connected to pin 34). The long slow blinks shows that we are in AT Command mode.

However, there are modules where the KEY pin is missing or is not wired to the actual KEY pin of the IC. To solve this, wire pin 34 of the IC to 3.3 V:

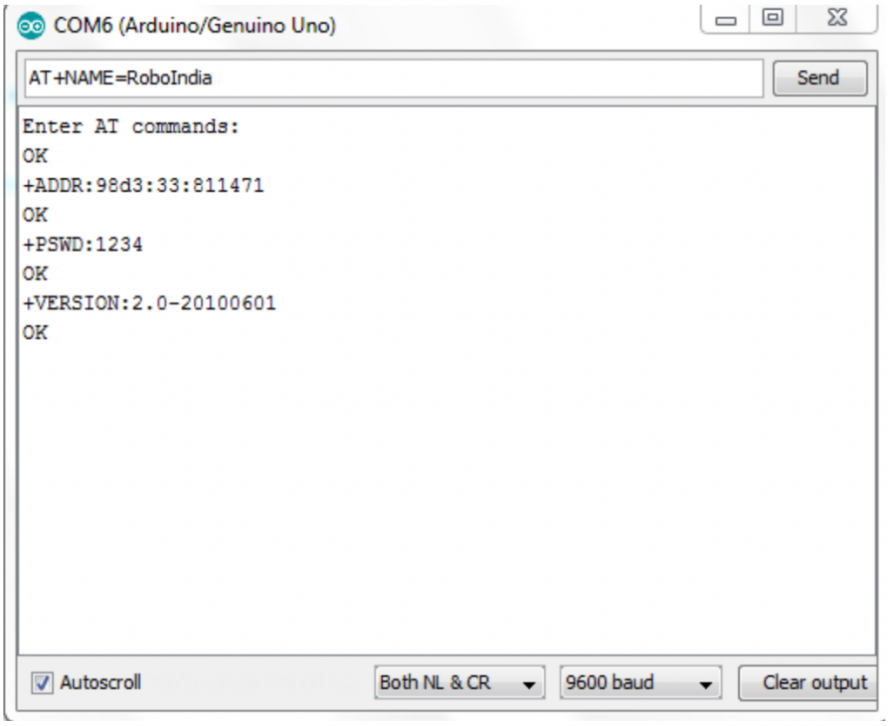


Programming

After configured this in AT Mode, upload the following code. Note that instead of connecting the Bluetooth to the Arduino's sore hardware Serial (Pins 0 and 1), we shall use SoftwareSerial and connect the bluetooth's RX and TX pins to any of the Arduino's free digital pins (7 and 8 in our code). This will help to avoid bus contention and will make sure the Bluetooth doesn't receive any spurious data during a sketch upload.

```
#include <SoftwareSerial.h>

SoftwareSerial BTSerial(7 , 8); // RX | TX

void setup()
{
  Serial.begin(9600);
  Serial.println("Enter AT commands:");
  BTSerial.begin(38400);       // HC-05 default speed in AT command more
}

void loop()
{
  if (BTSerial.available())    // read from HC-05 and send to Arduino Serial Monitor
  Serial.write(BTSerial.read());

  if (Serial.available())     // Keep reading from Arduino Serial Monitor and send to HC-05
  BTSerial.write(Serial.read());
}
```

Open the serial monitor. Be sure that the baud rate are set to 9600 and Both NL & CR are selected. If you send AT from serial monitor, OK will appear on the screen. Now you can change the name or password of the module, check address, version



Using HC-06

The HC-06 bluetooth module is a module that allows you to transform a signal on the UART \ USART bus, more commonly known simply as the serial bus, into a wireless signal via Bluetooth, generally using the SPP profile (Serial Port Profile). The HC-06 modules, since they require fewer components to be used, have a "Lite" version of the adapter board on which, among other things, a push button and the EN and STATE pins are missing, while the HC-05 modules have the full version of the adapter card. The HC-06 is in AT mode by default, and stays that way until a device connects with it.