SUN ROBOTICS

WIFI BASED APP-CONTROLLED DIY SMART ROBOTICS 2WD CAR (4X AA CELL INCLUDED)

www.sunrobotics.co.in

Preface

Sun Robotics is a technical service team of open source software and hardware. Dedicated to applying the internet and the latest industrial technology in open source area, we strive to provide best hardware support and software service for general makers and electronic enthusiasts around the world. We aim to create infinite possibilities with sharing. No matter what field you are in, we can lead you into the electronic world and bring your ideas into reality.

This is a Smart Robot Car. Some common electronic components and sensors are included. This tutorial shows how to control a Smart Car using an android device via Wi-Fi communication. The capability to control your smart car wirelessly has great advantage, no Longer you need to worry where your car is going, since it is under your control. Then also the remote control is in your phone, which is very accessible and not time consuming. Enjoy and create your own Controlled 2WD Smart Car.

Contents

- Lesson - 1 Install the ESP8266 Board Package and the Serial Port Driver
- Lesson - 2 WiFi Based App- Controlled DIY Smart Robotics 2WD Car

LESSON: 1 INSTALL THE ESP8266 BOARD PACKAGE AND THE SERIAL PORT DRIVER

INSTRUCTION:

The SunRobotics NodeMCU comes pre-programmed with Lua interpreter, but you don't have to use it! Instead, you can use the Arduino IDE which may be a great starting point for Arduino lovers to familiarize themselves with the technologies surrounding the IoT. Note that when you use the NodeMCU board with the Arduino IDE, it will write directly to the firmware, erasing the NodeMCU firmware. So if you want to back to Lua SDK, use the "flasher" to re-install the firmware.

The NodeMCU programming can be as easy as in Arduino, the main difference is the distribution of pins in the nodemcu board. Following below operations and enjoy your first NodeMCU & Arduino IDE travel!

1. **Connect your NodeMCU to the Computer**

Use the USB cable to connect your NodeMCU to the computer, you will see the blue onboard LED flicker when powered up, but they will not stay lit.

2. **Install the COM/Serial port driver**

In order to upload code to the ESP8266 and use the serial console, connect any data-capable micro USB cable to ESP8266 IOT Board and the other side to your computer's USB port.

The new version NodeMCUv1.0 comes with the CP2102 serial chip, you can download and install the driver here.

The NodeMCUv0.9 comes with the CH340 serial chip, you can download and install the driver here.

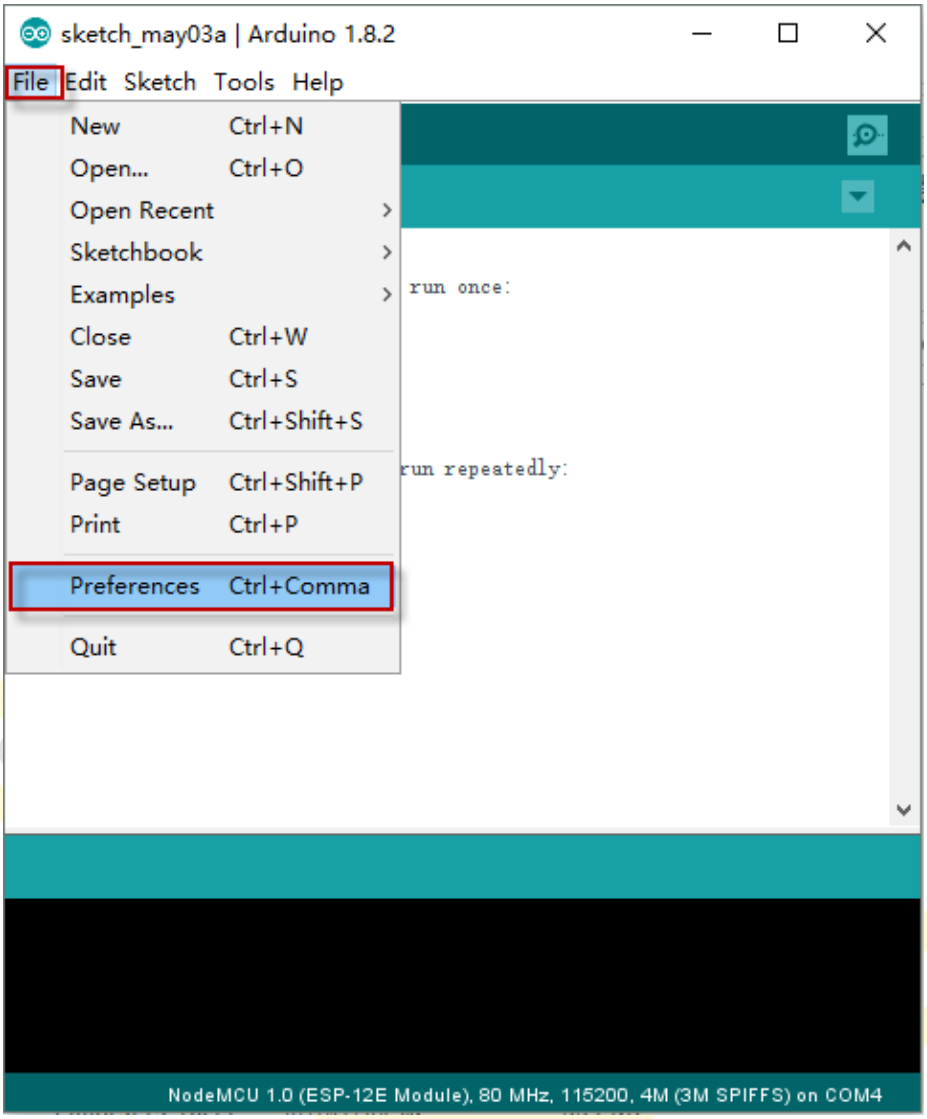
3. **Install the Arduino IDE 1.6.4 or greater**

Download Arduino IDE from Arduino.cc (1.6.4 or greater) – don't use 1.6.2! You can use your existing IDE if you have already installed it.

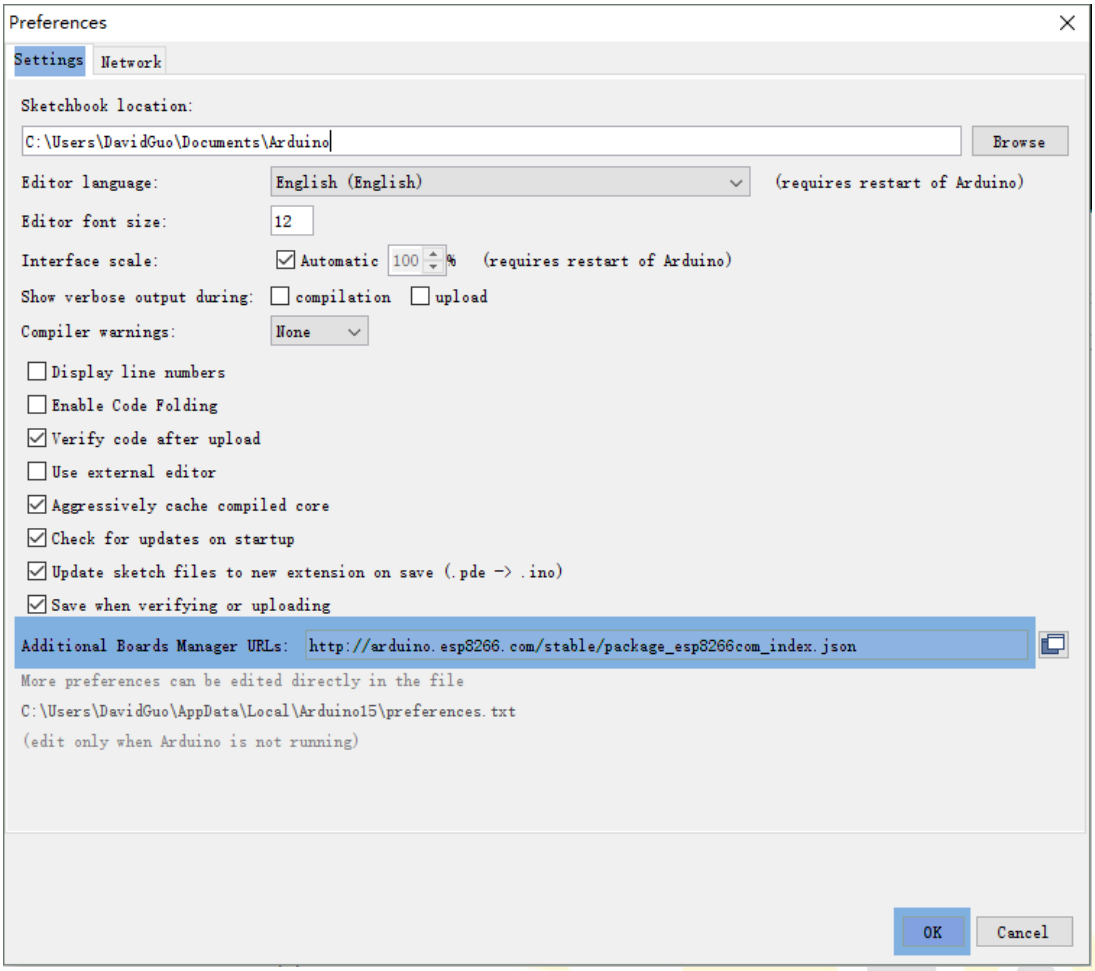
You can also try downloading the ready-to-go package from the ESP8266-Arduino project, if the proxy is giving you problems

4. **Install the ESP8266 Board Package**

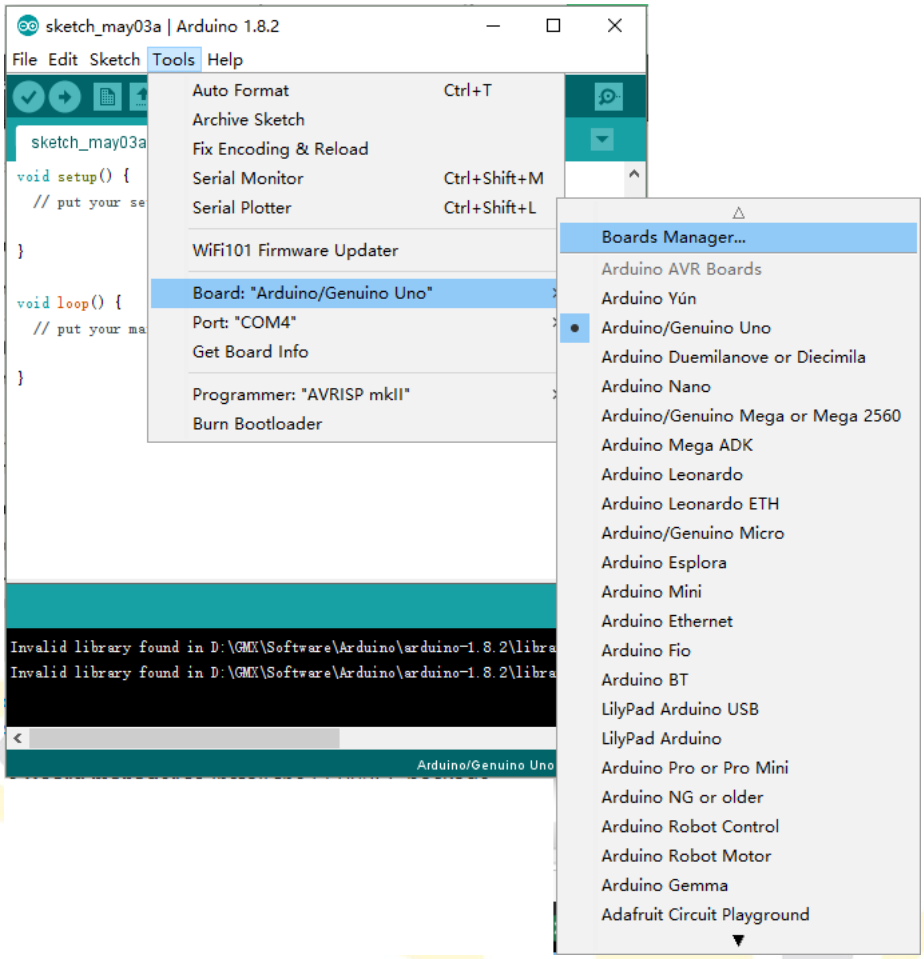
Enter http://arduino.esp8266.com/stable/package_esp8266com_index.json into Additional Board Manager URLs field in the Arduino v1.6.4+ preferences (Open Arduino IDE–>File–>Preferences–>Settings).



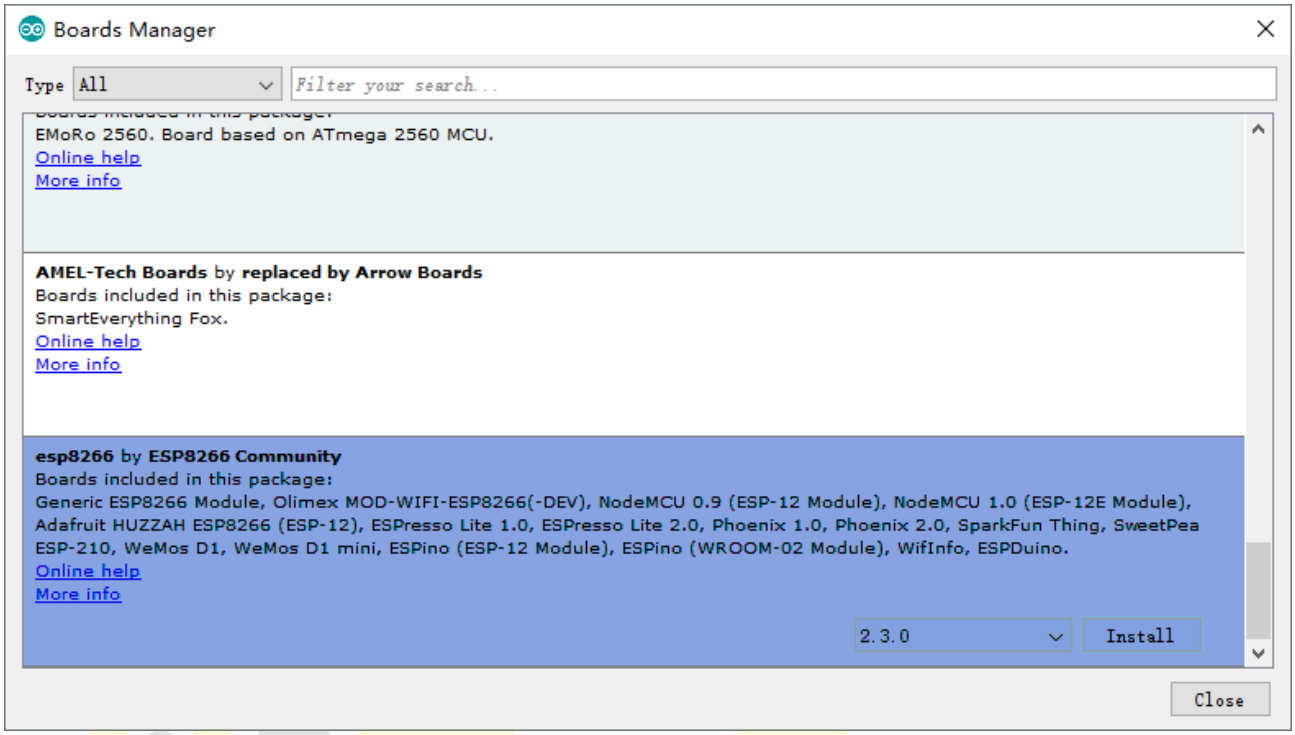
Enter the link and click “OK” to save your changes.



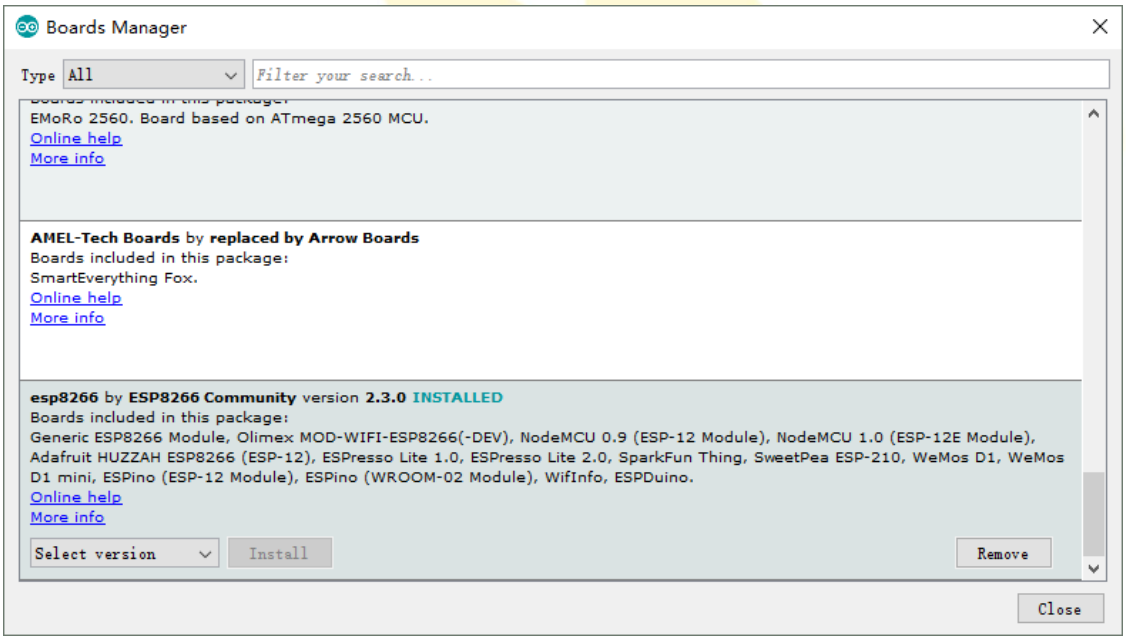
Next, use the Board Manager to install the ESP8266 package



Enter the Boards Manager and find the board type as below:



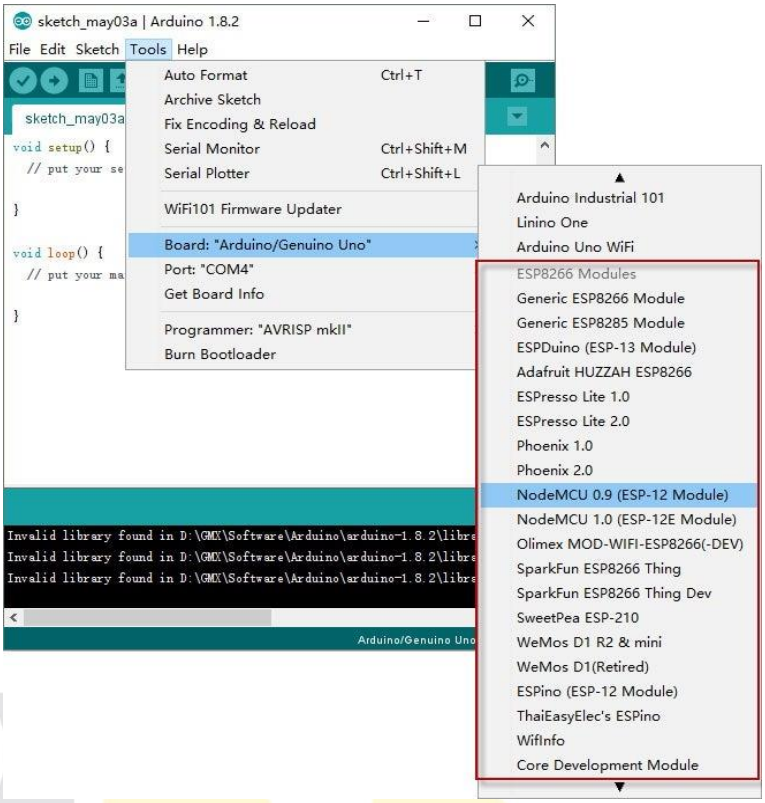
Scroll the Broads Manager screen down to the bottom, you will see A module called "esp8266 by esp8266 Community" (see following picture), select the latest version and click "Install".



The ESP8266 package has Benn installed successfully.
Note: You'd better close the Arduino IDE and restart it again.

5. Setup ESP8266 Support

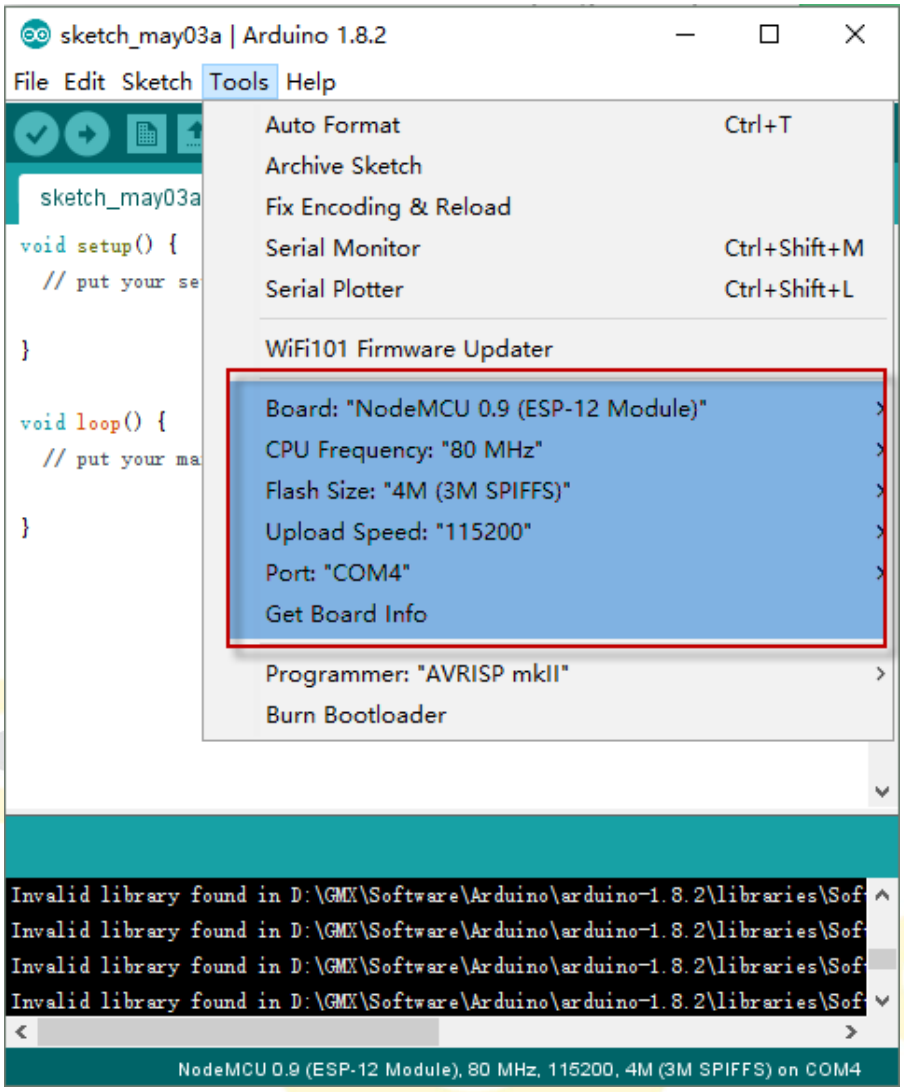
When you've restarted, select **NodeMCU 0.9** (or NodeMCU 1.0**)** from the Tools->Board dropdown



Config the Board menu and choose the right Port for your device.

- CPU Frequency：80MHz,
- Flash Size：4M（3M SPIFFS),
- Upload Speed：115200

Web: www.sunrobotics.co.in
Email:support@sunrobotics.co.in



Now just proceed as the Arduino: Start you're sketching!

Note: 115200 baud upload speed is a good place to start – later on you can try higher speeds but 115200 is a good safe place to start.

LESSON: 2 WIFI BASED APP-CONTROLLED DIY SMART ROBOTICS 2WD CAR

1.1 Overview:

Simplest wifi car controlled by your smartphone using NodeMcu esp8266 and Blynk.

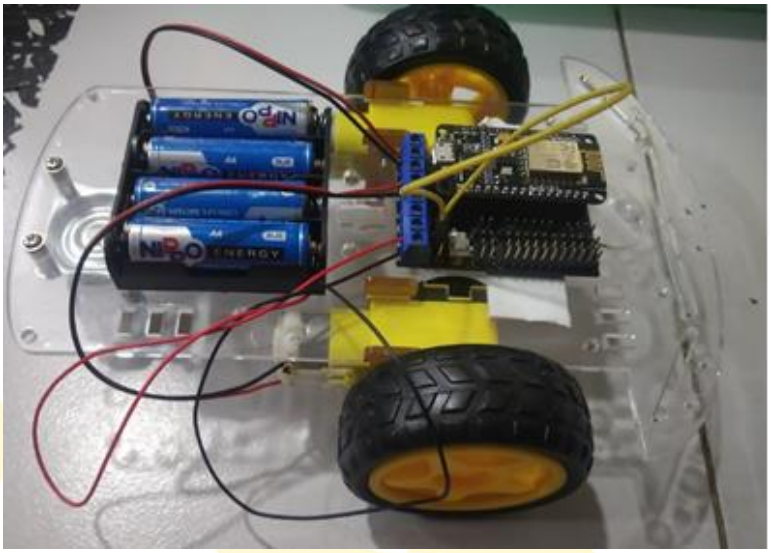


Figure: 1.1

1.2 Component List:

- 1 x 2WD Smart Robot Car Chassis DIY Kit
- 1 x ESP8266
- 1 x ESP motor shield
- 1 x USB Programming Cable

Figure: 1.2

1.3 Principle:

I found very simple way to make a wifi car. You actually need 4 things: NodeMcu esp8266, esp motor shield, chassis and your smartphone.

ESP motor shield:

There's not so much information on the Internet about this board. First of all this shield for ESP-12E Dev Kit and NodeMcu boards and not for all, because width between pins is 25mm and that's not enough for some boards like LoLin.

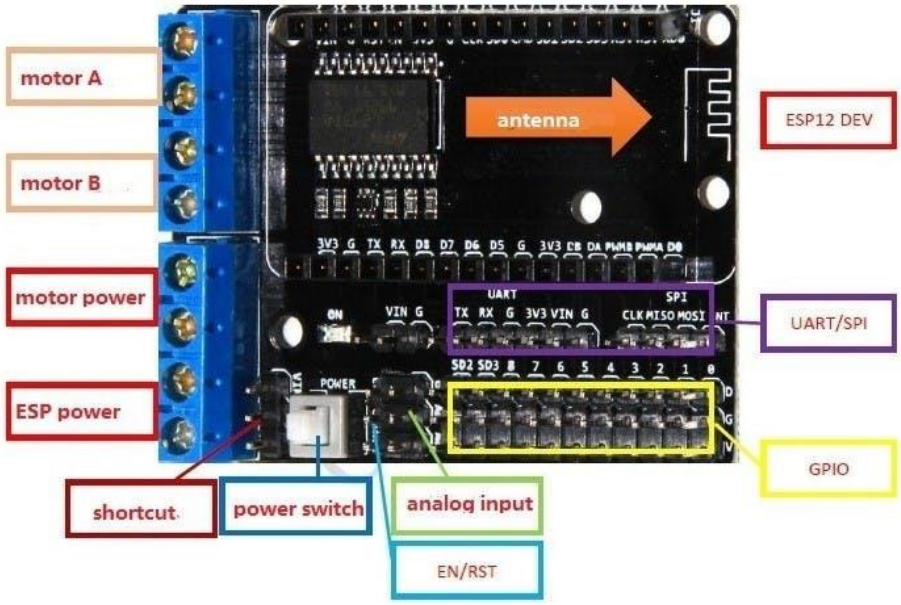


Figure: 1.3

This shield board is driven by the special extent large power full-bridge chip L293DD from the famous STMicroelectronics Company, which can directly drive 2-channels DC motors or one-channel stepper motor. The driven current can be arrived at 1.2A.

Motor power: can be up to 36V.

ESP power: can be up to 9V. Because it goes straight to the esp without any voltage regulators.
Also these pins have common ground, you can connect voltage supply to one pin and use shortcut for other (if voltage less than 9V).

Board uses 4 pins to control motors. PWMA, PWMB- speed of motors. DA, DB-direction of motors (0-straight; 1-reverse).
Here pin out for NodeMCU.

- PWMA-GPIO5.
- PWMB-GPIO4.
- DA-GPIO0.
- DB-GPIO2.

1.4 Esp8266 NodeMCU:

NodeMCU Development kit provides access to these GPIOs of ESP8266. The only thing to take care is that NodeMCU Dev kit pins are numbered differently than internal GPIO notations of ESP8266

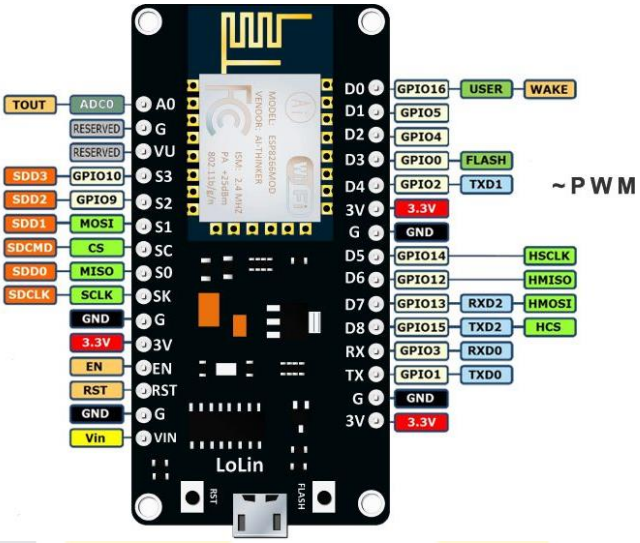
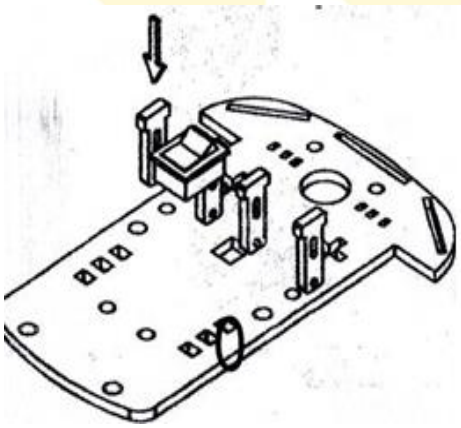


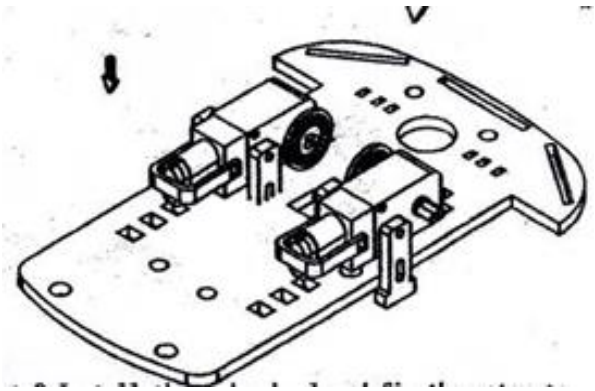
Figure: 1.4

1.5 4WD Assembly:

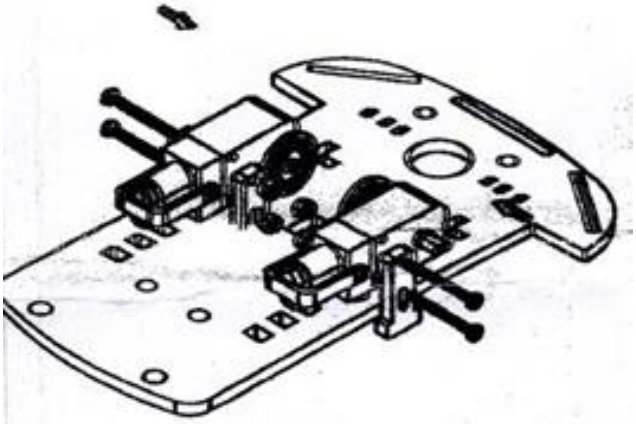
Step-1: Insert the fastener into the chassis



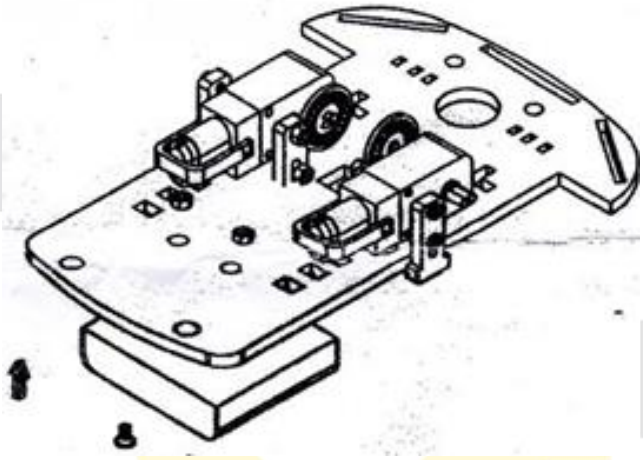
Step-2: Insert the code wheel and fix the motor to chassis



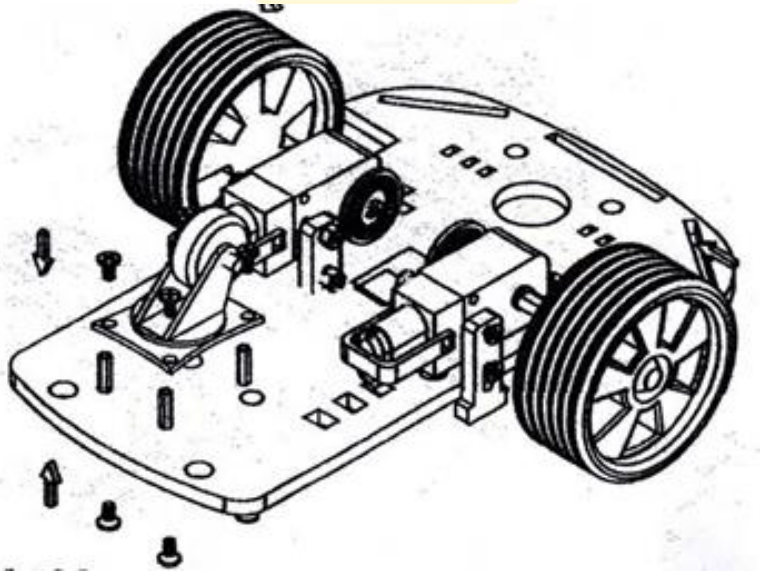
Step-3: Fix the motor to chassis, Then insert and tight the screws



Step-4: Insert the screws the and fix the battery connector

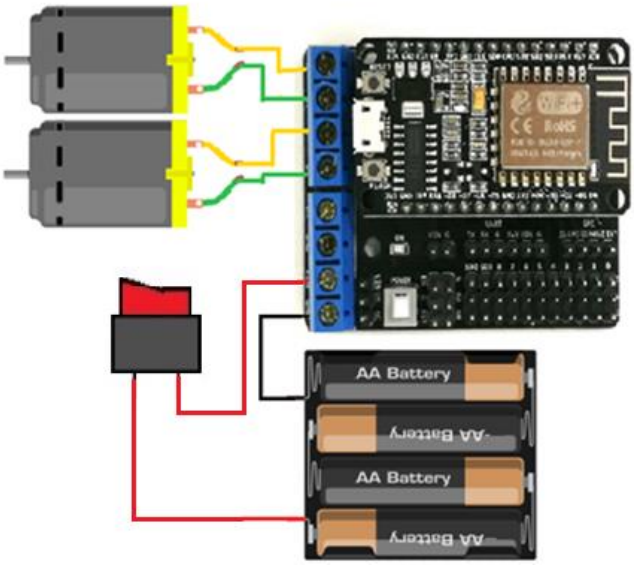


Step-5: Insert the spacer and tighten the 8 screw to fix the hammer caster.Hold tight and insert the motor to the wheel.



1.5 Procedure:

Step 1: Build the circuit as below:



Step 2: Program code uploaded

After selecting the board, paste your AuthToken & type your wifi username & password.you will get your AuthToken after downloading and creating a project in the app blynk, see below how to deal with the app.

Wifi_Based_App_Controlled_DIY_Smart_Robotics_2WD_CAR_Code

```
**************************WELCOMES YOU*****************************
*File name:Wifi_Based_App_Controlled_DIY_Smart_Robotics_2WD_CAR_With_7.4
*Company: SunRobotics Technologies
Website: www.sunrobotics.co.in
E-mail: support@sunrobotics.co.in(For Any Query)
/*********************************************************************/
#define BLYNK_PRINT Serial
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>

// You should get Auth Token in the Blynk App.
// Go to the Project Settings (nut icon).
char auth[] = "YourAuthToken";

// Your WiFi credentials.
// Set password to "" for open networks.
char ssid[] = "YourNetworkName";
char pass[] = "YourPassword";

int PWMA=5;//Right side
```

Blynk AuthToken

WiFi user name & password

Get you AuthToken, for this download the joystick app and the register with your credentials and register with your active email (you will receive the AuthToken here).

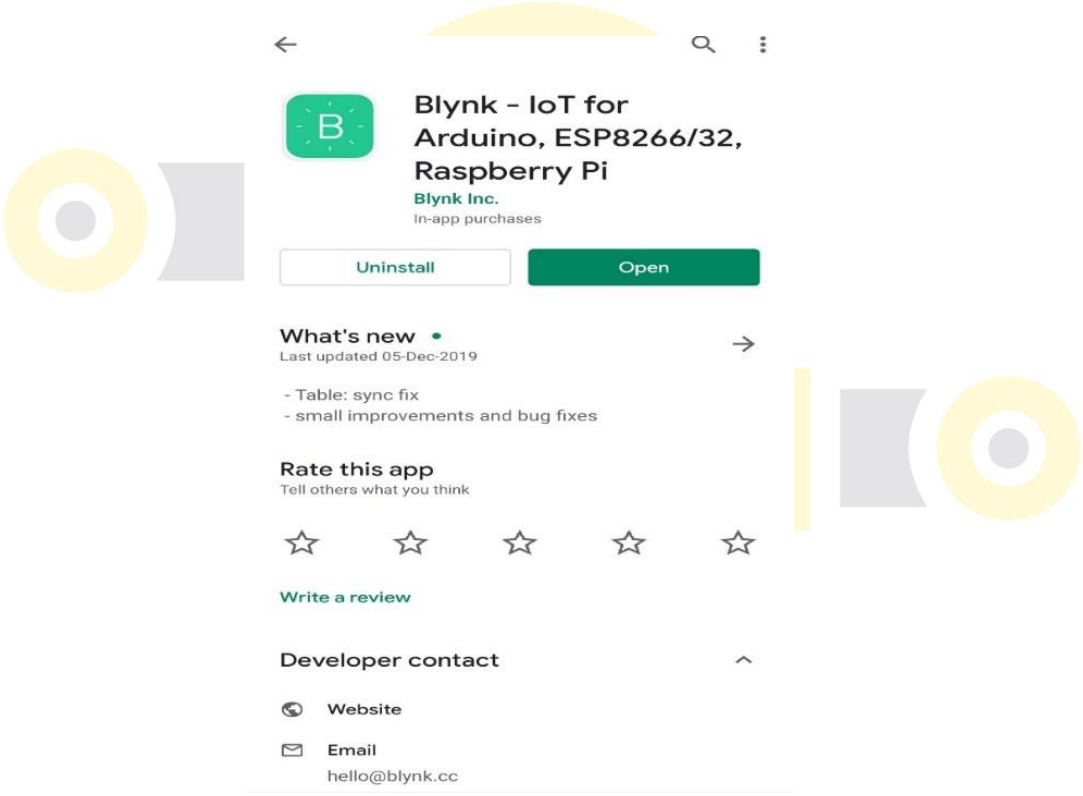
1.6 Blynk Application :

Introduction:

This guide will help you understand how to get started using Blynk and give a comprehensive overview of all the features.
If you want to jump straight into playing with Blynk, check out Getting Started.
https://blynk.io/

GETTING STARTED

Or
Download Blynk application from play store
In Blynk application we need only joystick.

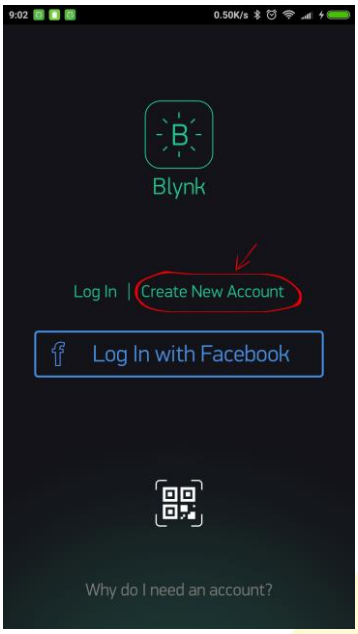


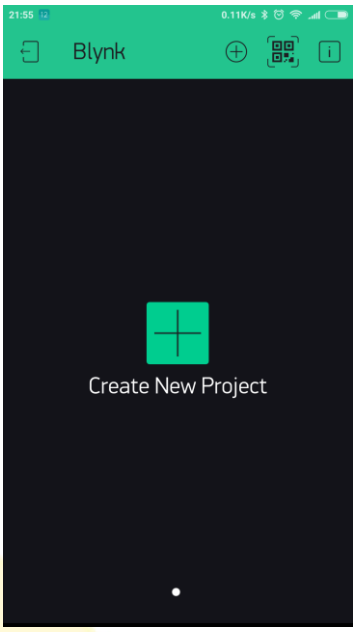
1. Create a Blynk Account:

After you download the Blynk App, you'll need to create a New Blynk account. This account is separate from the accounts used for the Blynk Forums, in case you already have one.
We recommend using a **real** email address because it will simplify things later.

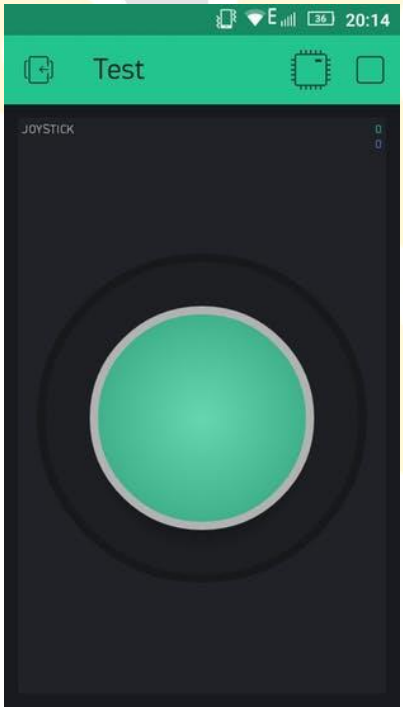
2. Create a New Project:

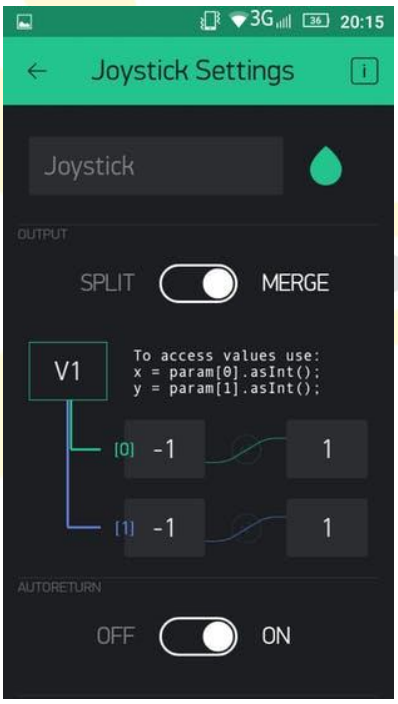
After you've successfully logged into your account, start by creating a new project.





3. Choose Your Hardware:

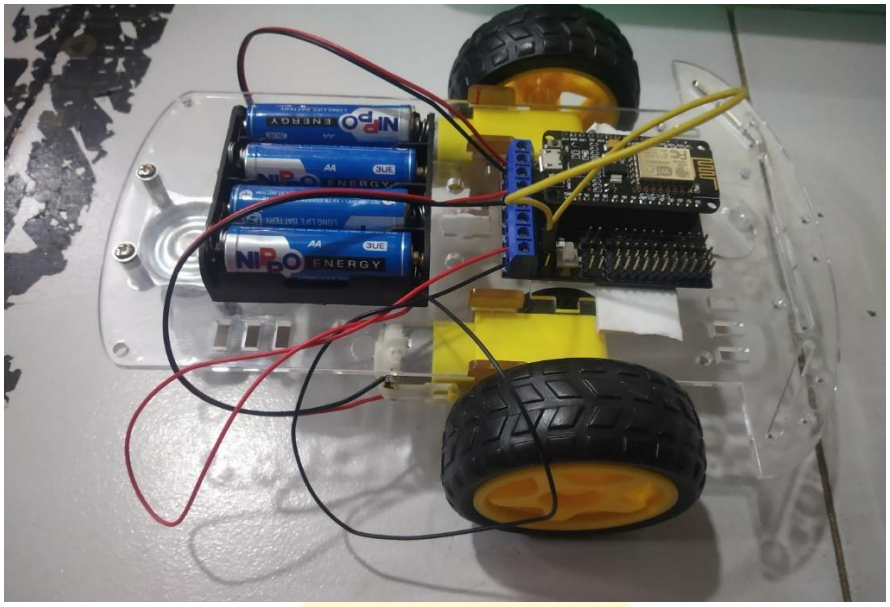




4. Joystick settings:

Set joystick to merge mode for work with Virtual pins. Values for both axis from (-1) to 1.

- Change output to merge
- Put 0 pin from -1 to 1
- Put 1 pin from -1 to 1
- **NOTE**:-Positive and negative power supply should be short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ENERGY

THANK YOU

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