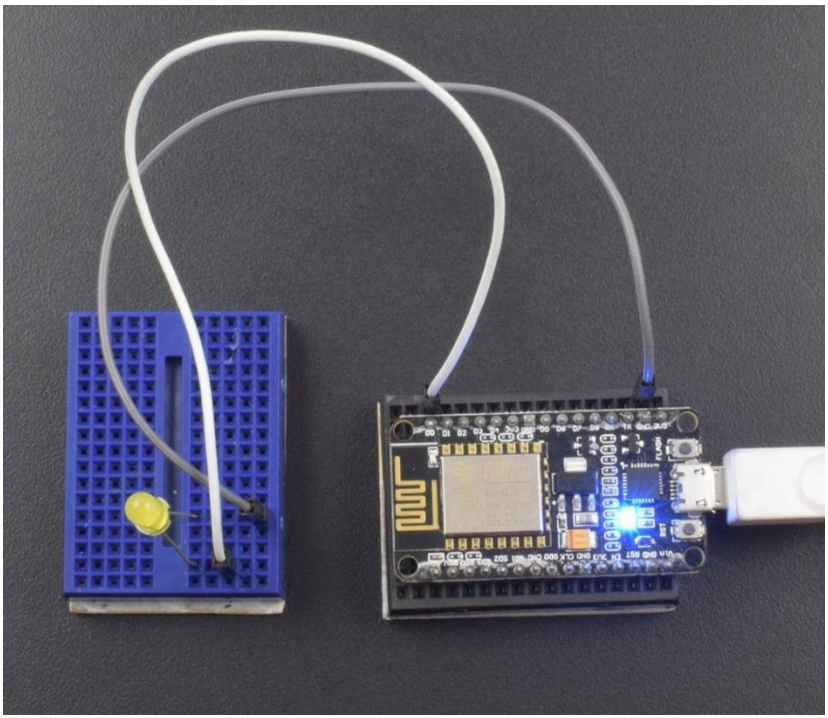
REES 52

PLANTING THE SEED OF INNOVATION

KT 87 2

Control LED by Programming Node MCU ESP8266 12E using Arduino IDE

PLANTING THE SEED OF INNOVATION



NodeMCU Dev Board is based on widely explored esp8266 System on Chip from Express if. It combined features of WIFI access point and station + microcontroller and uses simple LUA based programming language. ESP8266 NodeMCU offers-

- Arduino-like hardware IO
- Event-driven API for network applications
- 10 GPIOs D0-D10, PWM functionality, IIC and SPI communication, 1-Wire and ADC A0 etc. all in one board

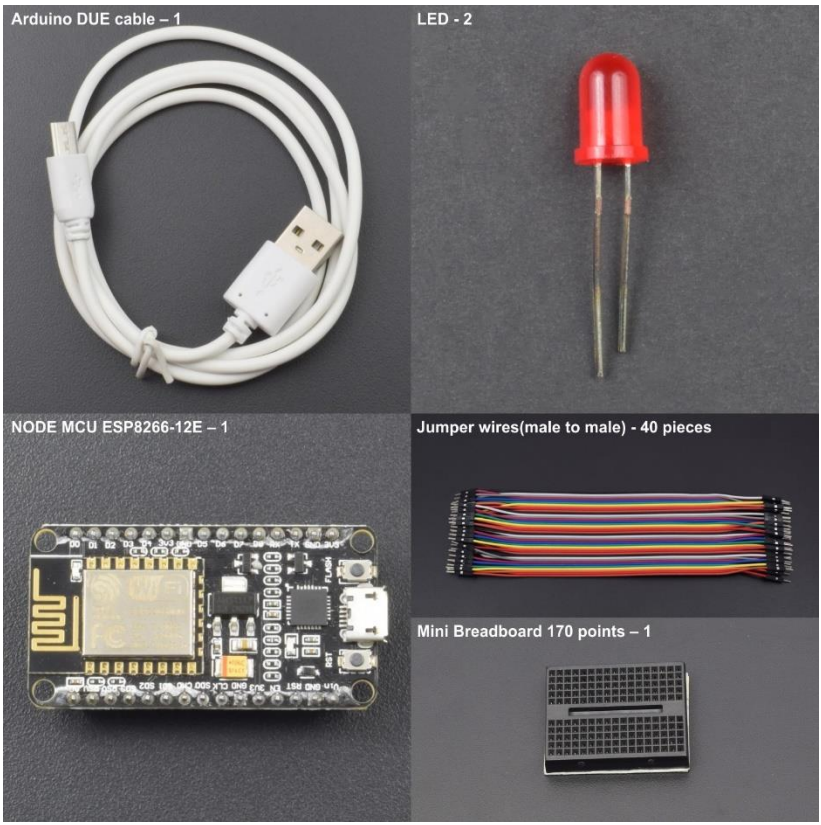
- Wi-Fi networking (can be uses as access point and/or station, host a webserver), connect to internet to fetch or upload data.
- Excellent system on board for Internet of Things (IOT) projects

Specifications

- SDIO 2.0, SPI, UART
- 32-pin QFN package
- Integrated RF switch,24dBm PA, DCXO, and PMU
- Integrated RISC processor, on-chip memory and external memory interfaces
- Integrated MAC/baseband processors
- Quality of Service management
- I2S interface for high fidelity audio applications
- On-chip low-dropout linear regulators for all internal supplies
- Proprietary spurious-free clock generation architecture
- Integrated WEP, TKIP, AES, and WAPI engines

Hardware Required

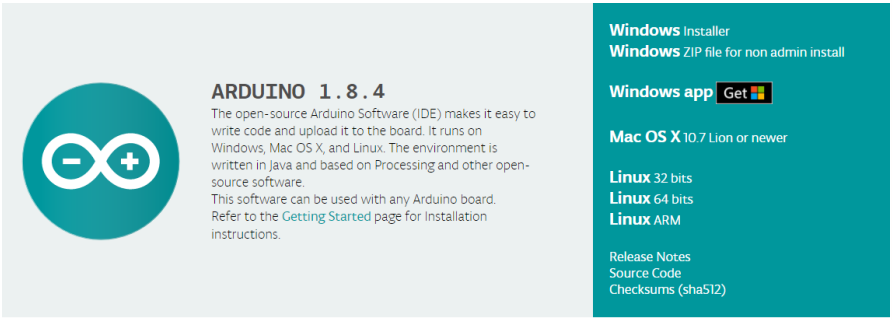
- NODE MCU ESP8266-12E – 1
- Arduino DUE cable – 1
- Mini Breadboard 170 points – 1
- LED - 2
- Jumper wires(male to male) - 40 pieces each



Software Required

Arduino IDE 1.8.5 (Programmable platform for Arduino boards)

You can download it from this link: https://www.arduino.cc/en/Main/Software)

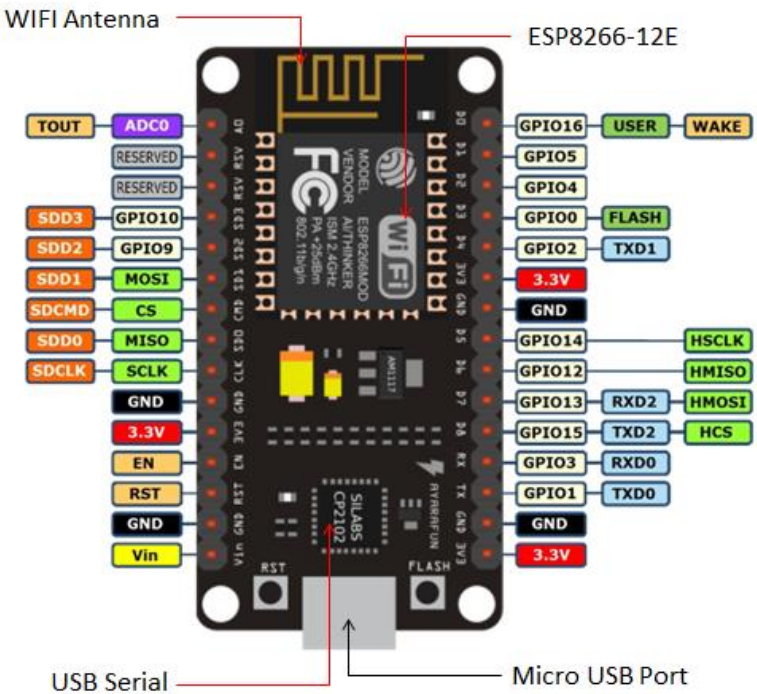


Pin Description

Node MCU ESP8266-12E

ESP8266EX offers a complete and self-contained Wi-Fi networking solution; it can be used to host the application or to offload Wi-Fi networking functions from another application processor. When ESP8266EX hosts the application, it boots up directly from an external flash. In has integrated cache to improve the performance of the system in such applications.

- NodeMCU ESP-12E dev board can be connected to 5Vusing micro USB connector or VIN pin available on board.
- The I/O pins of ESP8266 communicate or input/output max 3.3V only. I.e. the pins are NOT 5V tolerant inputs.
- In case you have to interface with 5V I/O pins, you need to use level conversion system (either built yourself using resistor voltage divider or using ready to use level converters



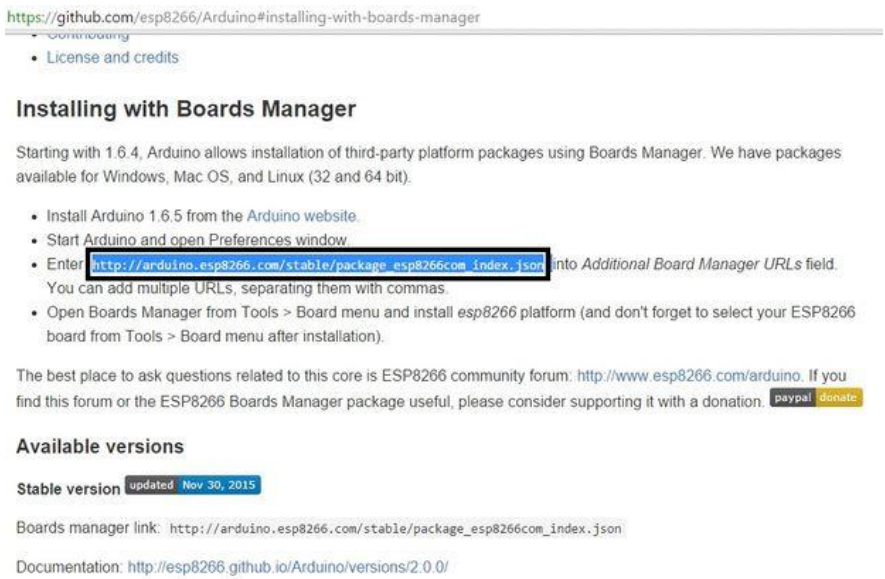
STEP- 1 Installing Arduino Core for NodeMCU ESP-12E Using Arduino Boards Manager

As shown in the image, Copy the .json link with latest stable release of NodeMCU package from

https://github.com/esp8266/Arduino#installing-with-boards-manager

The link should look something like this-

http://arduino.esp8266.com/stable/package_esp8266com_index.json



Step 2: Insert Link for .json NodeMCU Package Files into Arduino IDE

Paste the copied link and insert it in Arduino IDE using following sequence-

File → menu → Preferences

Paste copied link into the area shown in black box in above image. Close and restart the Arduino IDE.

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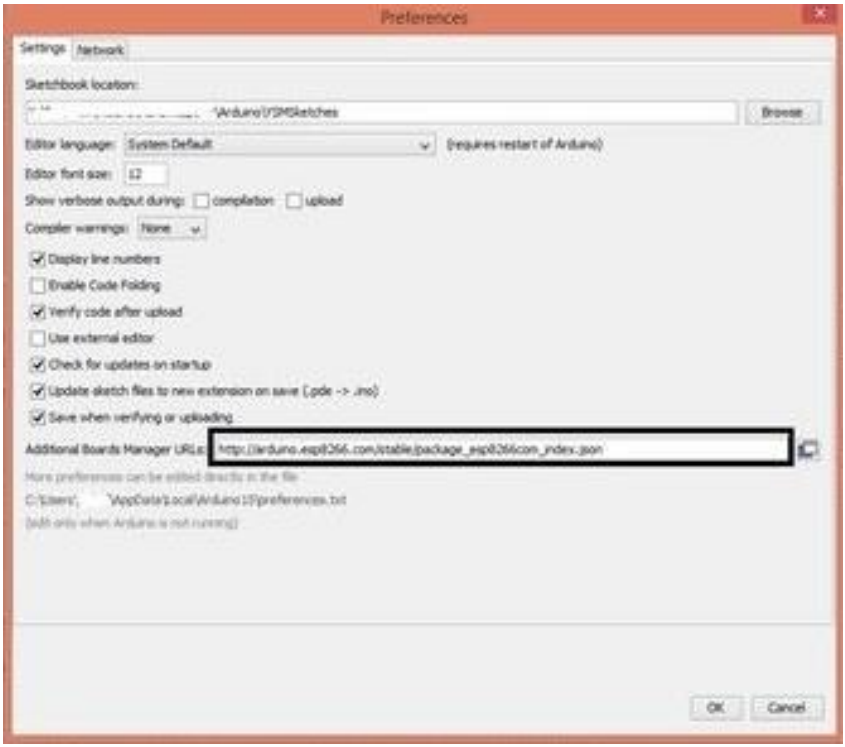
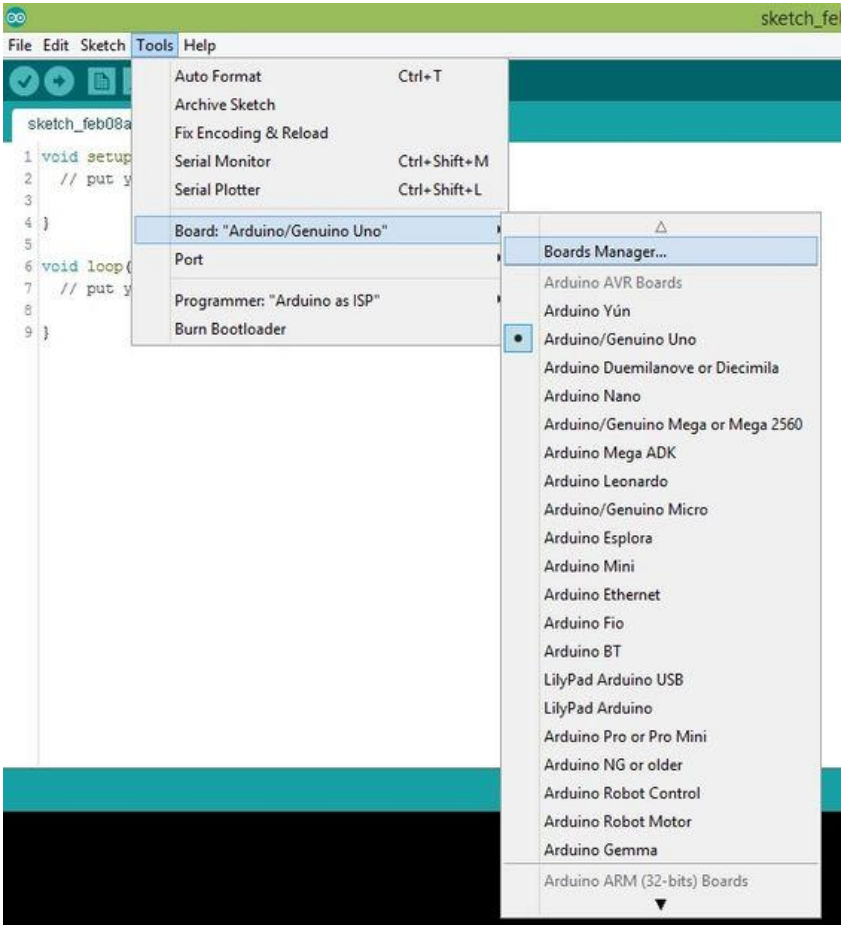
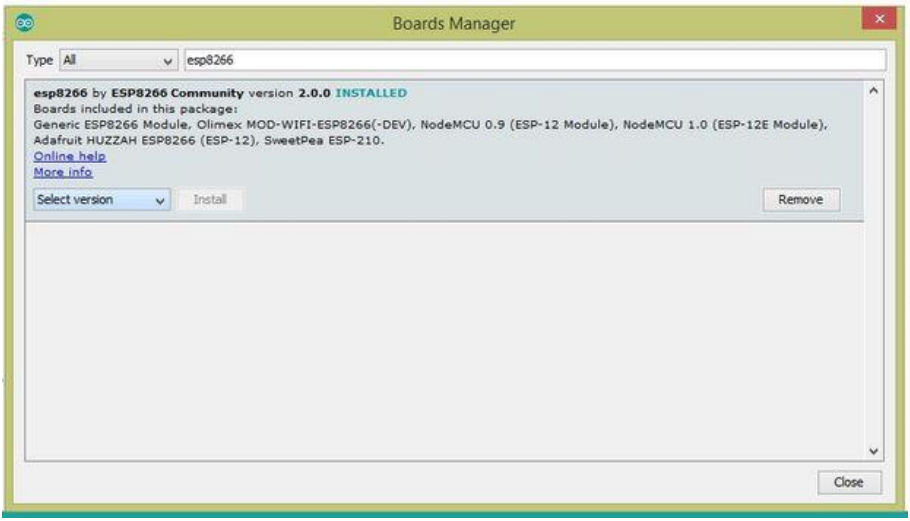
Step 3: Tools - Boards Manager



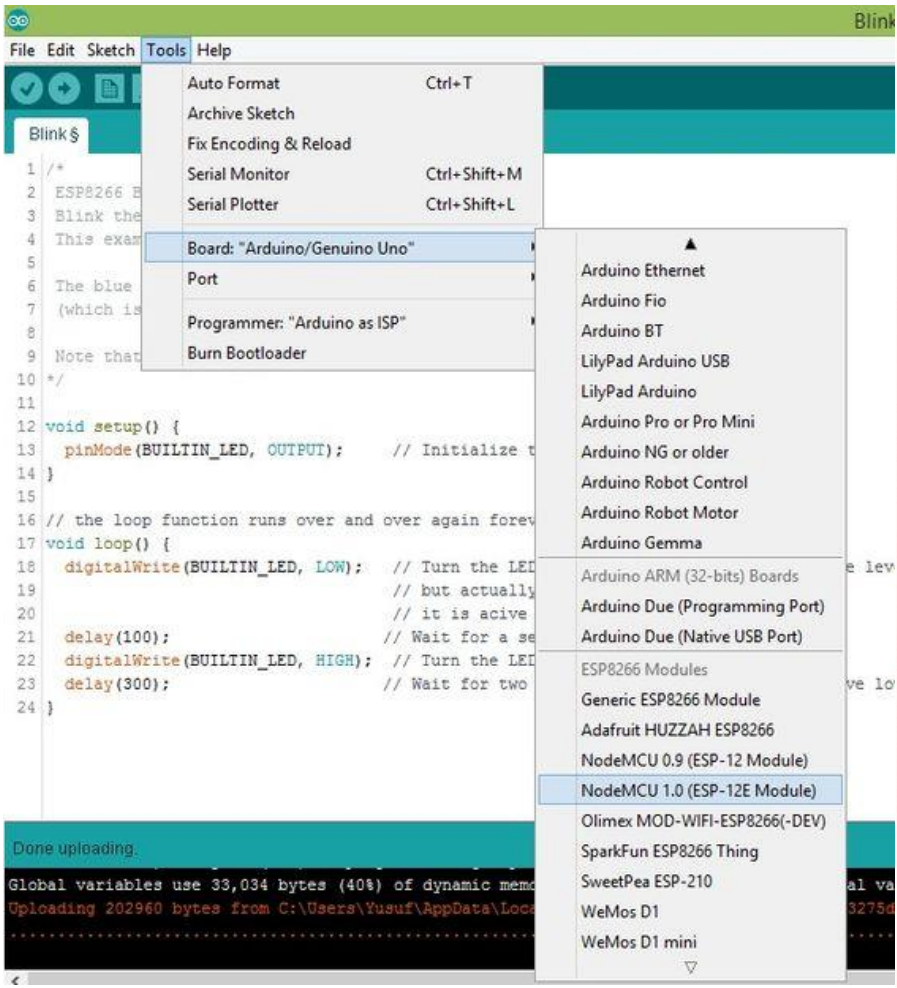

File Edit Sketch Tools Help
Auto Format Ctrl+T
Archive Sketch
Fix Encoding & Reload
Serial Monitor Ctrl+Shift+M
Serial Plotter Ctrl+Shift+L
Board: "Arduino/Genuino Uno"
Port
Programmer: "Arduino as ISP"
Burn Bootloader
Boards Manager...
Arduino AVR Boards
Arduino Yún
Arduino/Genuino Uno
Arduino Duemilanove or Diecimila
Arduino Nano
Arduino/Genuino Mega or Mega 2560
Arduino Mega ADK
Arduino Leonardo
Arduino/Genuino Micro
Arduino Esplora
Arduino Mini
Arduino Ethernet
Arduino Fio
Arduino BT
LilyPad Arduino USB
LilyPad Arduino
Arduino Pro or Pro Mini
Arduino NG or older
Arduino Robot Control
Arduino Robot Motor
Arduino Gemma
Arduino ARM (32-bits) Boards



Tools → Boards manager and search for ESP8266 and install the libraries/files given under heading ESP8266 by ESP community.

Restart the Arduino IDE once again

Step 4: Selecting NodeMCU Board in Arduino IDE


File Edit Sketch Tools Help
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Serial Plotter Ctrl+Shift+L
Board: "Arduino/Genuino Uno"
Port
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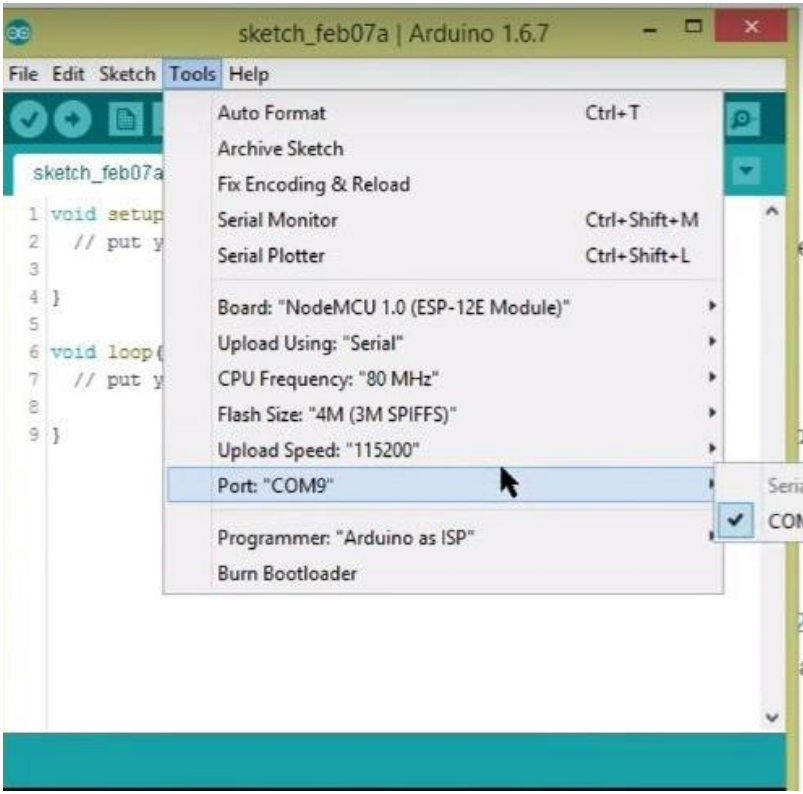
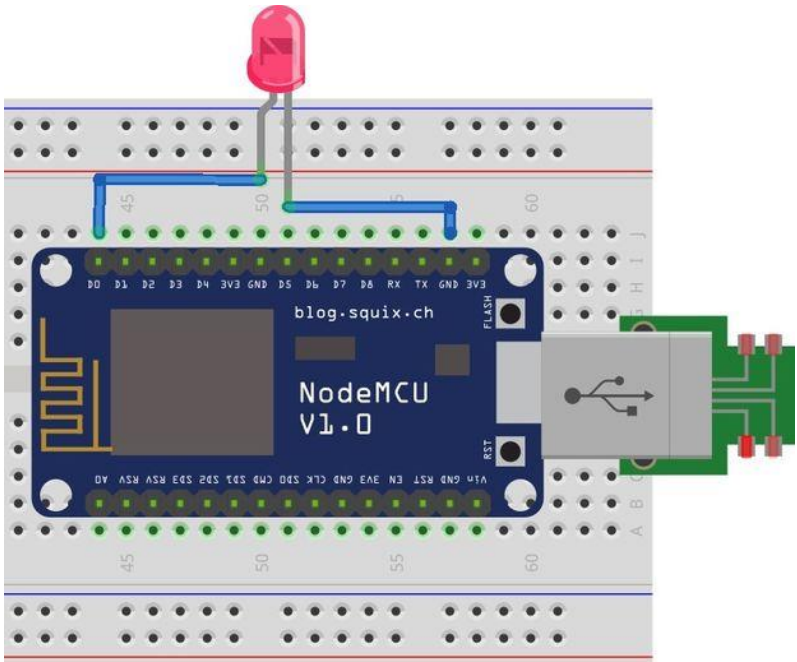
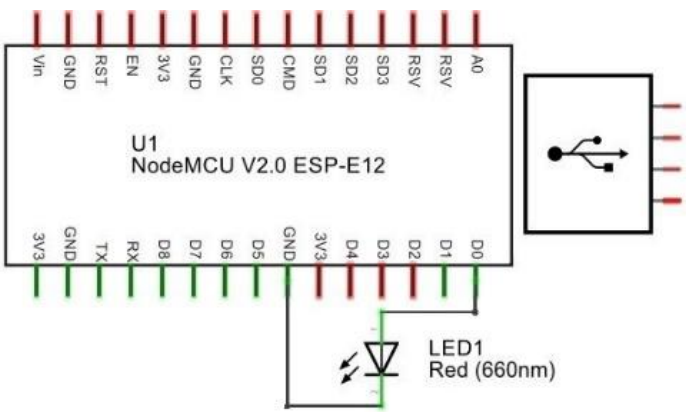
Burn Bootloader
Arduino Ethernet
Arduino Fio
Arduino BT
LilyPad Arduino USB
LilyPad Arduino
Arduino Pro or Pro Mini
Arduino NG or older
Arduino Robot Control
Arduino Robot Motor
Arduino Gemma
Arduino ARM (32-bits) Boards
Arduino Due (Programming Port)
Arduino Due (Native USB Port)
ESP8266 Modules
Generic ESP8266 Module
Adafruit HUZZAH ESP8266
NodeMCU 0.9 (ESP-12 Module)
NodeMCU 1.0 (ESP-12E Module)
Olimex MOD-WIFI-ESP8266(-DEV)
SparkFun ESP8266 Thing
SweetPea ESP-210
WeMos D1
WeMos D1 mini
Done uploading.



Go to Tools → Boards (scroll down the list of boards) - Select NodeMCU 1.0 (ESP-12EModule).

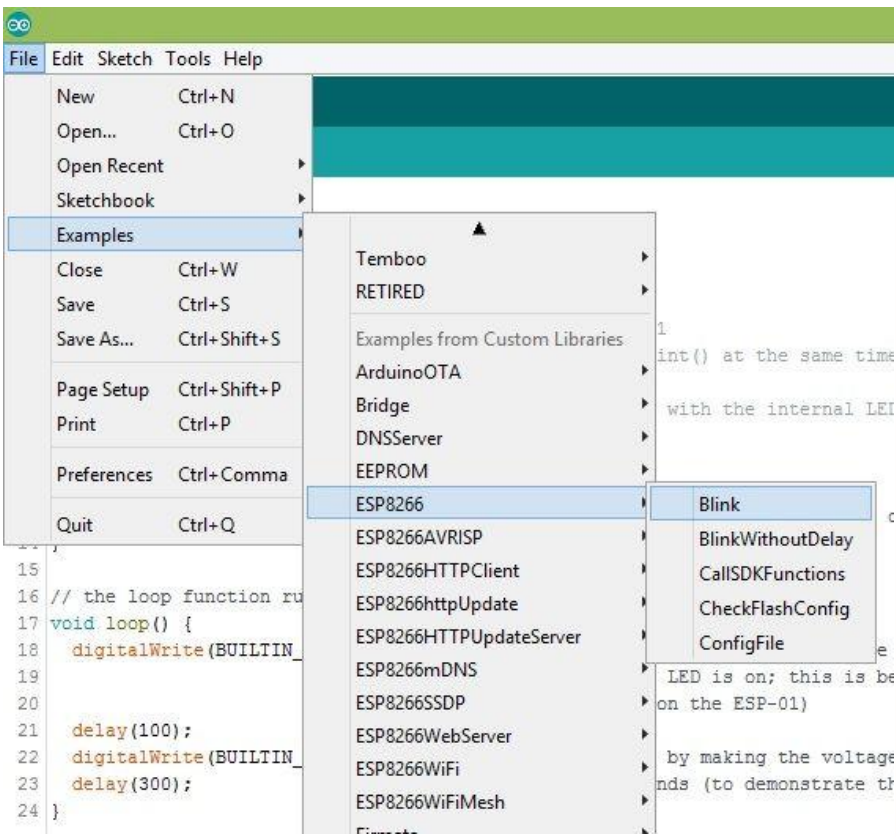
Select the Port number at which you have connected nodeMCU. Rest of the settings can be left to default values.


blog.squix.ch
NodeMCU
V1.0
FLASH
RST


Vin GND RST EN 3V3 GND CLK SD0 CMD SD1 SD2 SD3 RSV RSV A0
U1
NodeMCU V2.0 ESP-E12
3V3 GND TX RX D8 D7 D6 D5 GND 3V3 D4 D3 D2 D1 D0
LED1
Red (660nm)

We will be connecting external LED directly to GPIO16 or D0 pin of NodeMCU (no need of external current limiting resistor). This is the pin number for onboard LED or BUILTIN_LED

Code



Go to File → Examples → ESP8266 → Blink

Upload the sketch to ESP and the On-board LED blue and external LED red starts blinking alternately at every second.

Note- In case, if Arduino IDE version 1.6.7 fails to work for you, try to go back to arduino 1.6.5 or backwards. (Some NodeMCU boards have issues with latest versions of Arduino IDEs and going to earlier versions of Arduino IDE solves the problems).

ROBOTICS EMBEDDED EDUCATION SERVICES PVT. LTD.

For any queries, Contact On :-

+91-9599594524

011-65355152

Website - www.rees52.com

Email - suppourt@rees52.com