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Abstract—**This manual shows how to program an ESP8266 board using Arduinos and Raspberry Pi. The procedure is the same for any Linux machine.**

1 COMPONENTS

The necessary components for this manual are listed in Table I.

Component	Quantity
ESP8266	1
Raspberry Pi 4	1
Arduino Uno	1
Female-Female Jumper Wires	9
Resistor(1000Ω)	1
LED	1
Breadboard	1

TABLE I

2 SOFTWARE SETUP

Download the 32-bit arm version from the below link

```
https://www.arduino.cc/en/main/software
```

2.1 Installing Arduino

Open a terminal and execute the following commands

```
cp ~/Downloads/arduino-x.x.x-tar.gz ~/
tar xf arduino-x.x.x-tar.gz
cd arduino-x.x.x
sudo ./install.sh
```

2.2 Installation ESP8266 instructions using Arduino IDE Boards Manager

Start Arduino and open Preferences window. Enter the below link into Additional Board Manager URLs field

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

```
#Open Boards Manager from Tools
#Install ESP8266 platform
#Select Generic ESP8266 Module board from
    tools
```

3 HARDWARE SETUP

3.1 LED Blink

Connect the Arduino to a USB port of the Raspberry Pi. The hardware connections between the Arduino and ESP8266 are available in Table III. See Fig.1 as well as Fig.2 for Pin configurations

ESP8266	Arduino
GND	GND
Tx	Tx
GPIO2	GND
CH EN	VCC
RESET	GND
Rx	Rx
VCC	3.3V

TABLE II: ESP8266-Arduino connections

- Connect arduino RESET pin to GND

```
#Execute the following code
#Code for LED Blinking
https://github.com/d-DP/ESP8266/blob/master/
    codes/blink/blink.ino
```
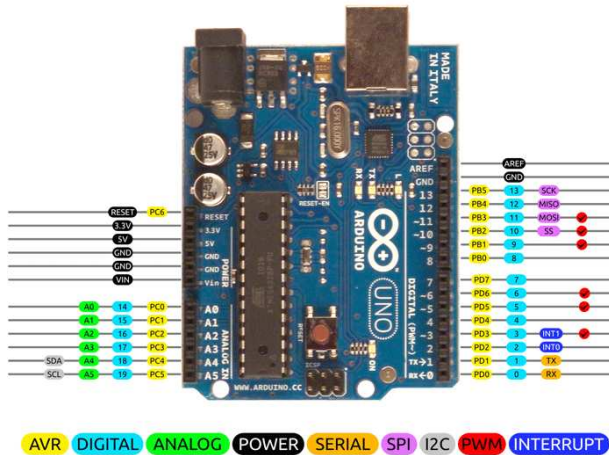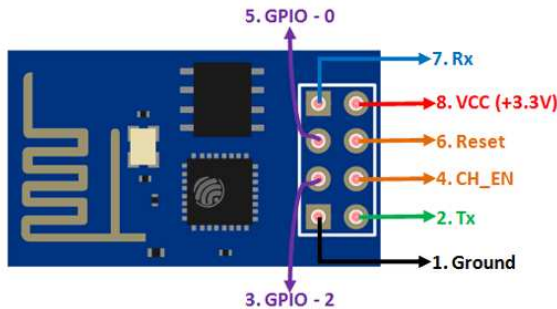
Fig. 1: Arduino Pin Configuration

Fig. 2: ESP8266 Pin Configuration

3.2 LED Blinking with wifi

1) Remove ATMEGA328P from Arduino Uno.
2) Make the connections according to the TABLE III and TABLE II but disconnect GPIO 2 and connect GPIO 0 to VCC

VCC	Resistor
Resistor	LED
LED	GND

TABLE III

#Execute the following code for Wifi Server
https://github.com/d-DP/ESP8266/blob/master/codes/WiFi_Blink/wifi/wifi.ino

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