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Abstract—This manual shows how to program an ESP32 board 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 |
|---------------------------|----------|
| ESP32 | 1 |
| Raspberry Pi 4 | 1 |
| LED | 2 |
| Breadboard | 1 |
| Male to Male Jumper Wires | 3 |

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 ESP32 instructions using Arduino IDE Boards Manager

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

```
https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json
```

```
#Open Boards Manager from Tools
#Install ESP32 platform
#Select ESP32 Dev kit from tools
```

3 HARDWARE SETUP

3.1 LED Blinking Using Bluetooth

Connect the ESP32 and Raspberry Pi with USB cable. The hardware connections between ESP32 and leds are available in table II. See Fig 1 for pin configurations.

| ESP32 | led |
|---------|---------|
| GND | cathode |
| GPIO 32 | anode |

TABLE II: ESP32-Led connections

```
#Execute the following code
#Code for LED Blinking
https://github.com/sridhar-07/ESP32/tree/master/codes/Bluetooth
```

3.2 LED Blinking with wifi

- 1) Make the connections according to the TABLE III Execute the following code.

```
https://github.com/sridhar-07/ESP32/tree/master/codes/Wi-Fi
```

- 1) Before executing, make two cathodes as common

| ESP32 | Pins |
|---------|----------|
| GPIO 26 | Led1 +ve |
| GPIO 27 | Led2 +ve |
| GND | Cathode |

TABLE III

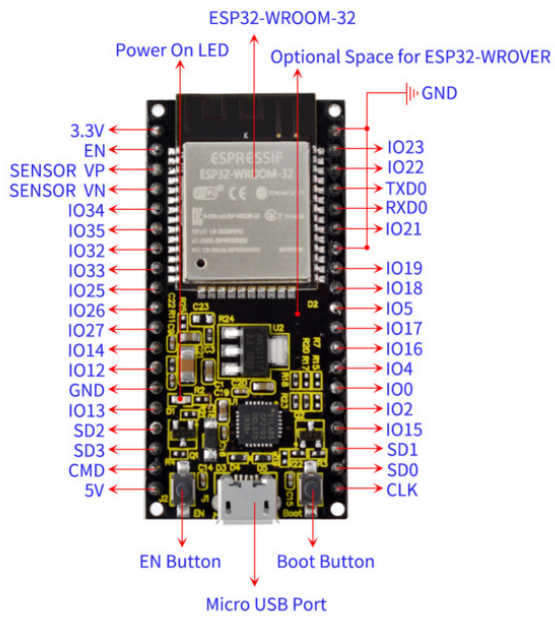


Fig. 1: ESP32 Pin Configuration