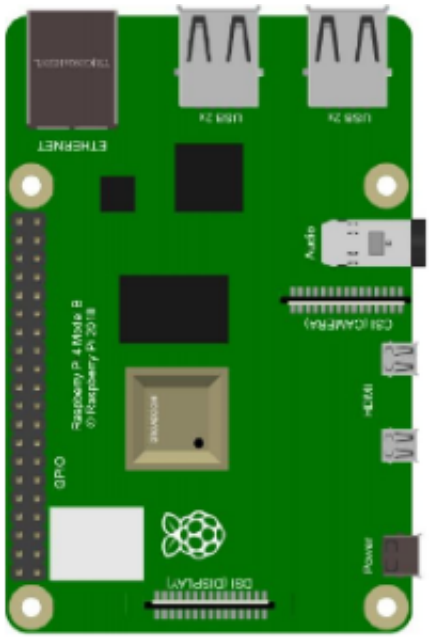
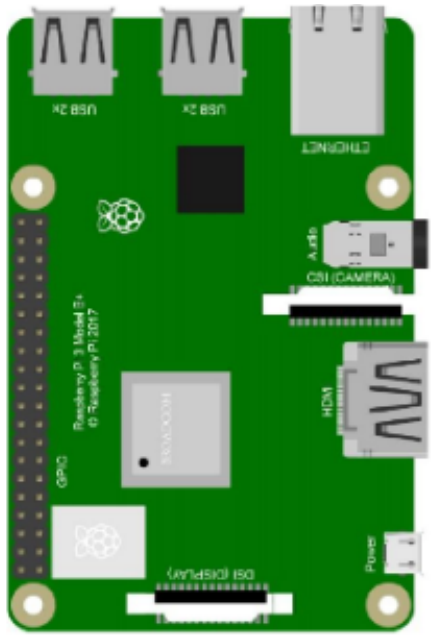
Raspberry Pi Dersleri

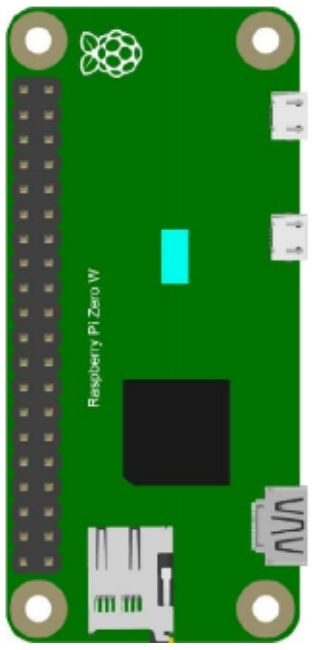
Raspberry Pi 4 Model B / CAD Cizimi:



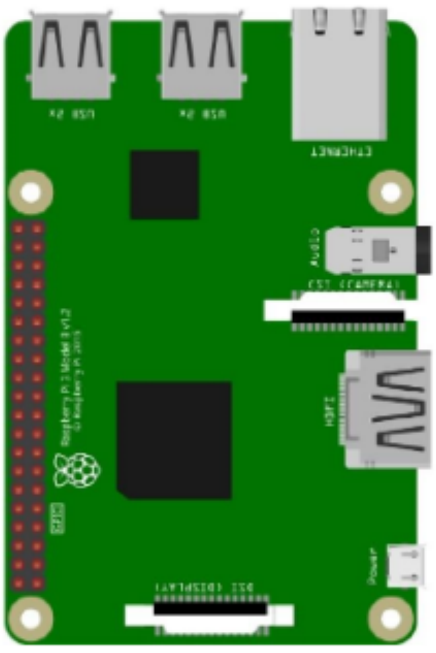
Raspberry Pi 3 Model B+ / CAD Cizimi:



Raspberry Pi Zero W / CAD Cizimi:



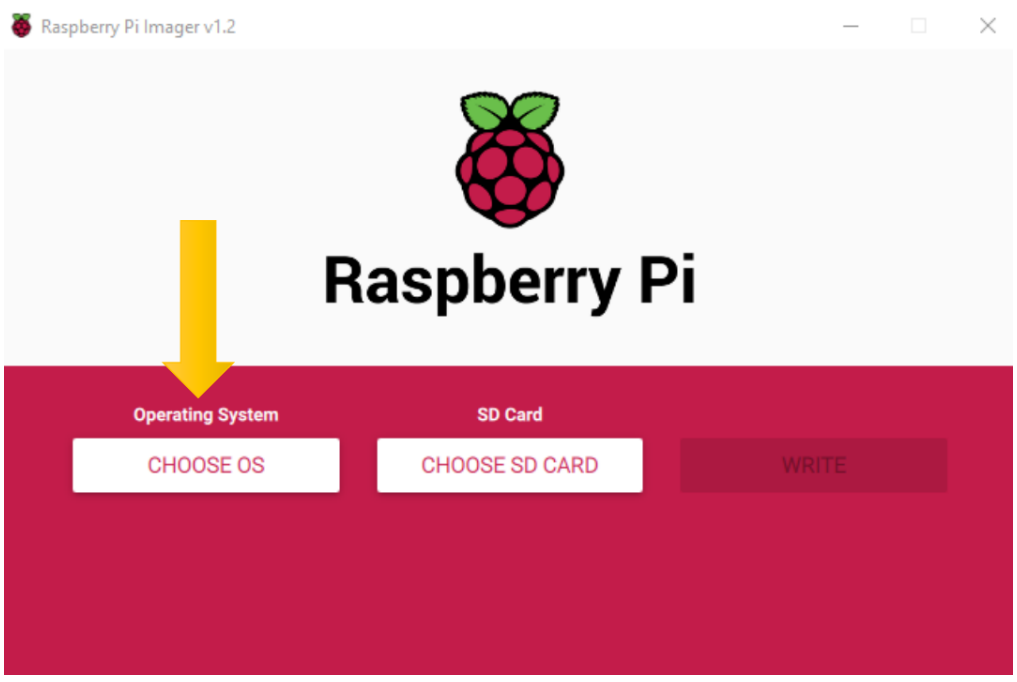
Raspberry Pi 3 Model B / CAD Cizimi:



Raspberry Pi Gereken Sarj Adaptörleri

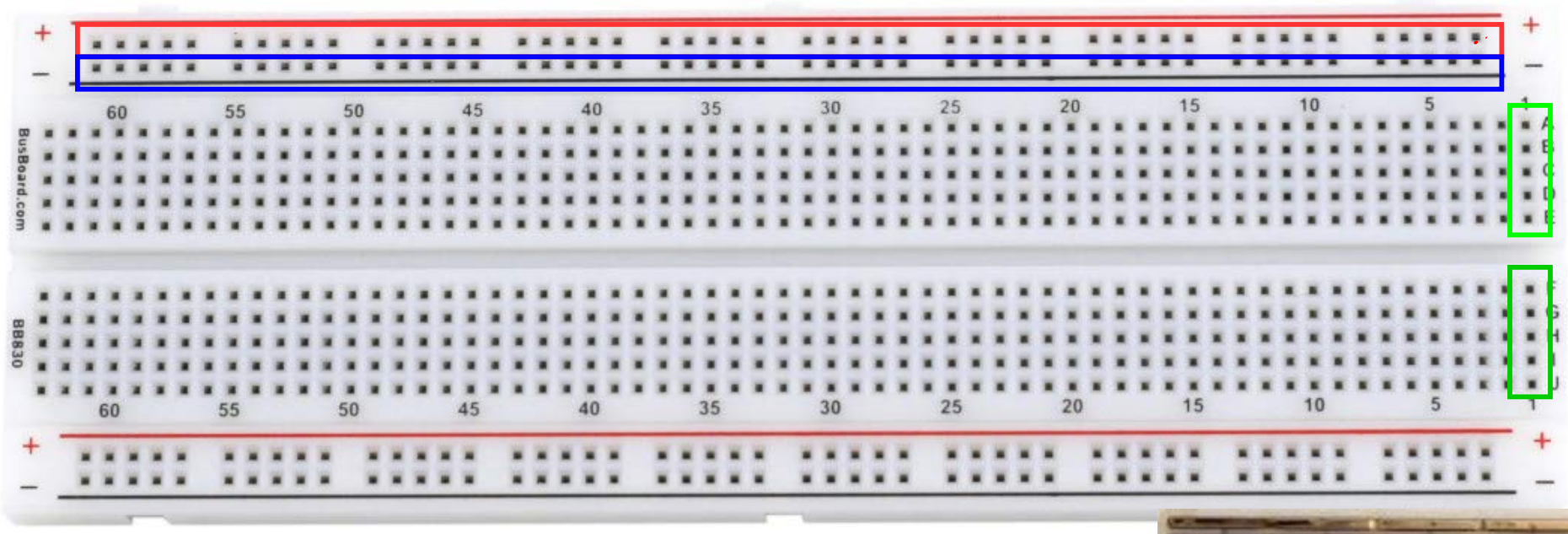
Raspberry Pi Model A	700mA
Raspberry Pi Model B	1.2A
Raspberry Pi Model A+	700mA
Raspberry Pi Model B+	1.8A
Raspberry Pi 2 Model B	1.8A
Raspberry Pi 3 Model B	2.5A
Raspberry Pi 3 Model A+	2.5A
Raspberry Pi 3 Model B+	2.5A
Raspberry Pi 4 Model B	3.0A
Raspberry Pi Zero W	1.2A
Raspberry Pi Zero	1.2A

Raspberry Pi Imager

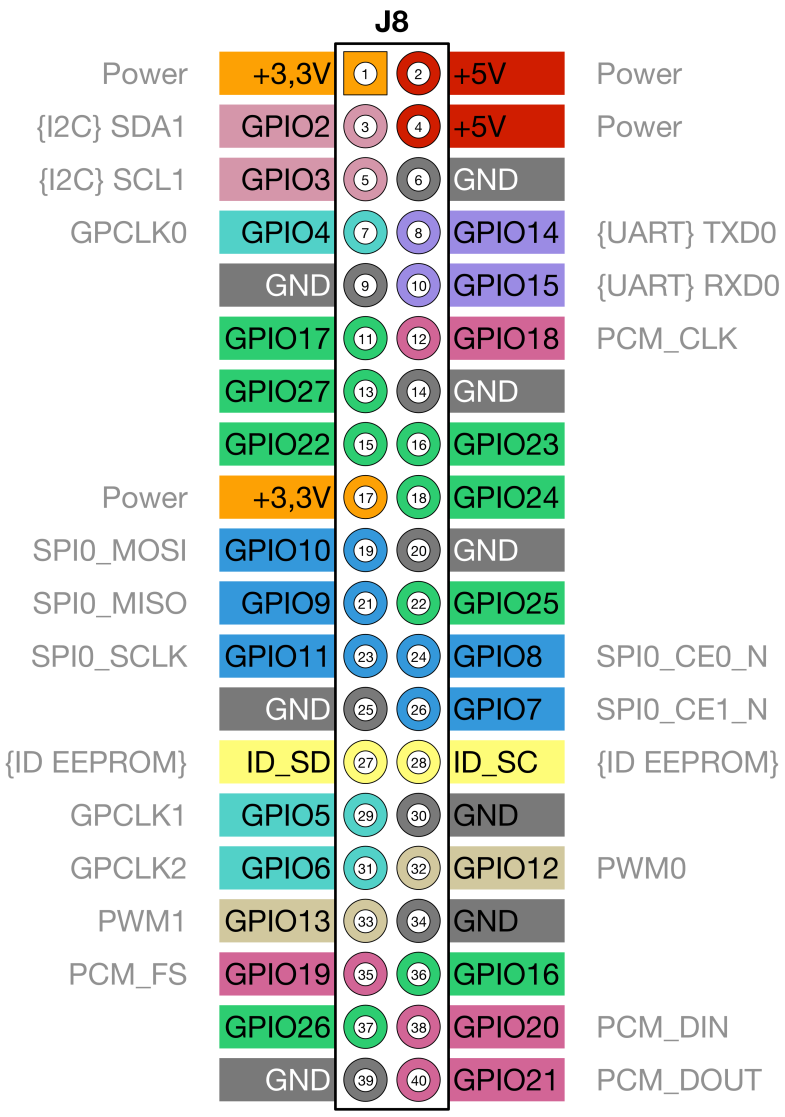


Bilgi: Ctrl+Shift+X ek Özellikler Acar!

Devre Tahtasi (Breadboard)



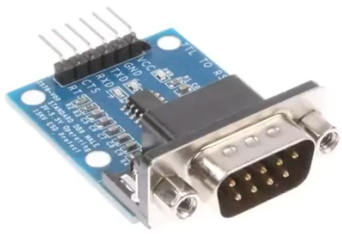
GPIO Haritasi



i²C: Inter-Integrated Circuit
SCL: Serial Clock
SDA: Serial Data

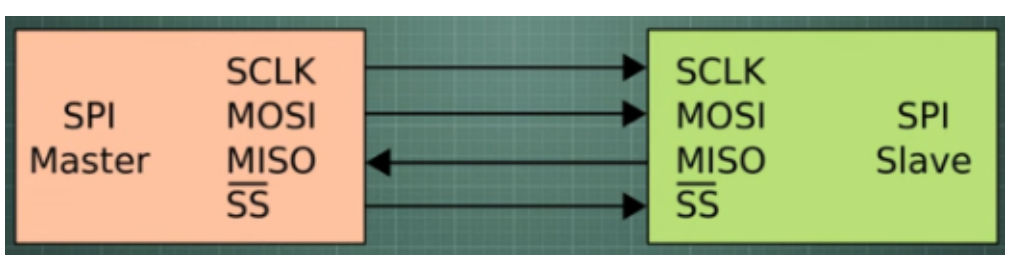
GPCLK: General Purpose Cloack (Fix Frekans Ayarlanabilir Pin)

UART: Universal Asynchronous Receiver Transmiter



EEPROM: Electrically Eraseable Programmable Read-Only Memory

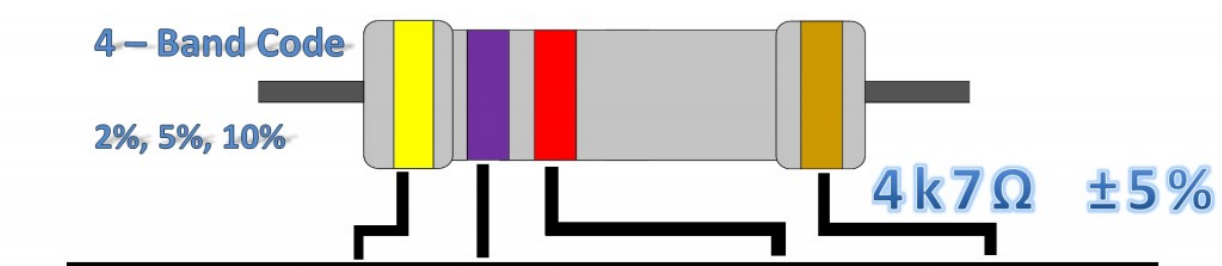
PCM: Pulse-Code Modulation



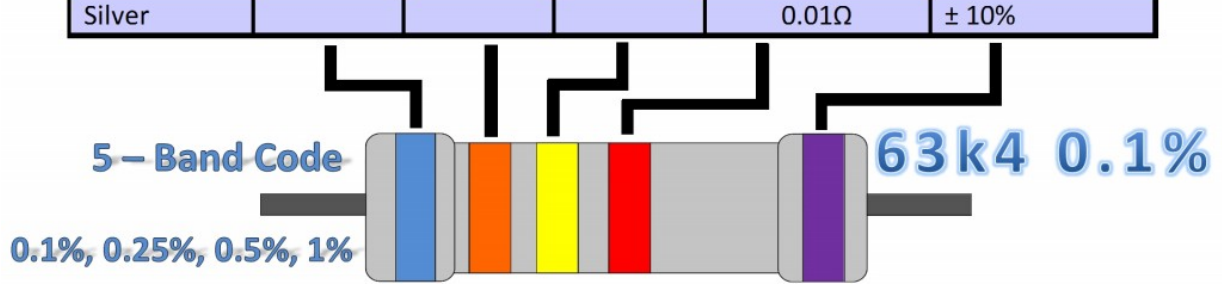
wiringPi Pin	BCM GPIO	Name	Header	Name	BCM GPIO	wiringPi Pin
—	—	3.3v	1 | 2	5v	—	—
8	R1:0/R2:2	SDA	3 | 4	5v	—	—
9	R1:1/R2:3	SCL	5 | 6	0v	—	—
7	4	GPIO7	7 | 8	TxD	14	15
—	—	0v	9 | 10	RxD	15	16
0	17	GPIO0	11 | 12	GPIO1	18	1
2	R1:21/R2:27	GPIO2	13 | 14	0v	—	—
3	22	GPIO3	15 | 16	GPIO4	23	4
—	—	3.3v	17 | 18	GPIO5	24	5
12	10	MOSI	19 | 20	0v	—	—
13	9	MISO	21 | 22	GPIO6	25	6
14	11	SCLK	23 | 24	CE0	8	10
—	—	0v	25 | 26	CE1	7	11
30	0	SDA.0	27 | 28	SCL.0	1	31
21	5	GPIO.21	29 | 30	0V		
22	6	GPIO.22	31 | 32	GPIO.26	12	26
23	13	GPIO.23	33 | 34	0V		
24	19	GPIO.24	35 | 36	GPIO.27	16	27
25	26	GPIO.25	37 | 38	GPIO.28	20	28
		0V	39 | 40	GPIO.29	21	29
wiringPi Pin	BCM GPIO	Name	Header	Name	BCM GPIO	wiringPi Pin

Direnc Kodu

Sokak Ta Sayamam Gibi



Color	1st Band	2nd Band	3rd Band	Multiplier	Tolerance
Black	0	0	0	1Ω	
Brown	1	1	1	10Ω	± 1%
Red	2	2	2	100Ω	± 2%
Orange	3	3	3	1kΩ	
Yellow	4	4	4	10kΩ	
Green	5	5	5	100kΩ	± 0.5%
Blue	6	6	6	1MΩ	± 0.25%
Violet	7	7	7	10 MΩ	± 0.1%
Grey	8	8	8		± 0.05%
White	9	9	9		
Gold				0.1Ω	± 5%
Silver				0.01Ω	± 10%



Wiring Pi Yükleme;

```
sudo apt-get update
git clone https://github.com/WiringPi/WiringPi
cd WiringPi
./build
```

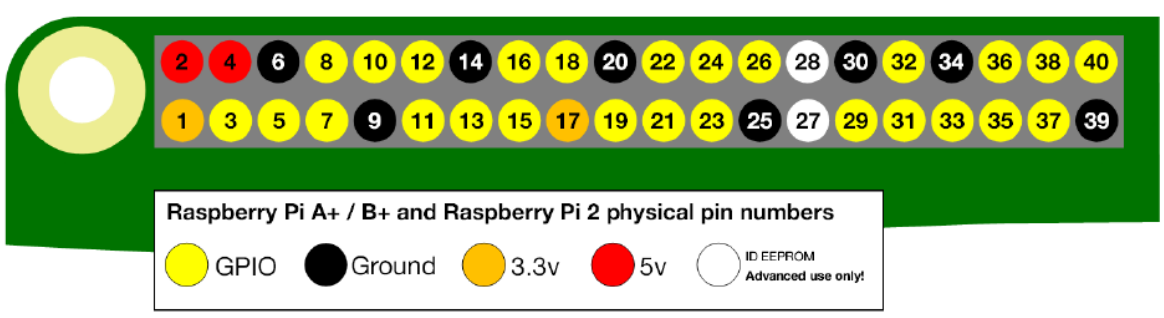
Test et:

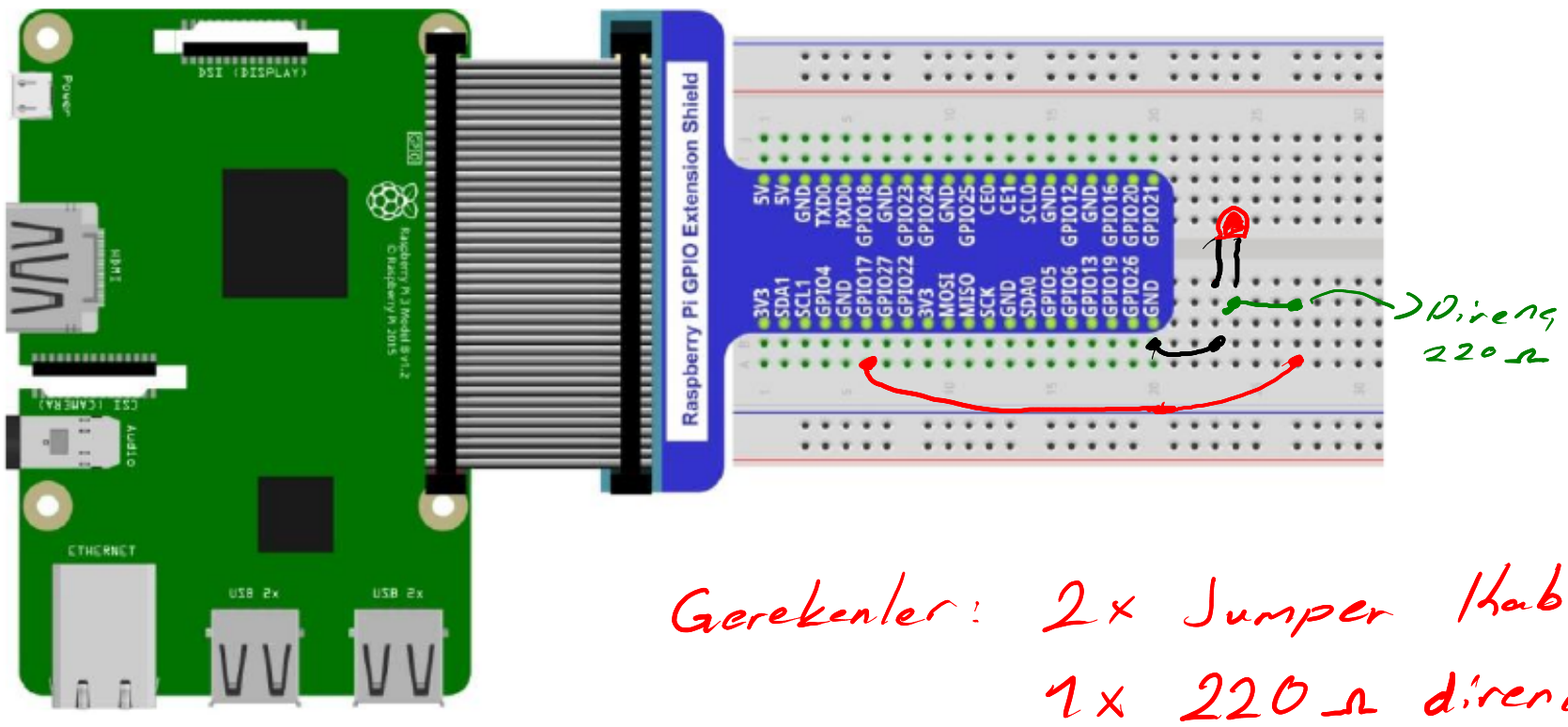
gpio readall

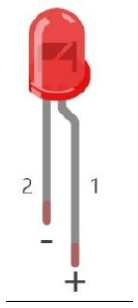
```
 +-----+-----+---------+------+---+---Pi 4B--+---+------+---------+-----+-----+
 | BCM | wPi |   Name  | Mode | V | Physical | V | Mode | Name    | wPi | BCM |
 +-----+-----+---------+------+---+----++----+---+------+---------+-----+-----+
 |     |     |    3.3v |      |   |  1 || 2  |   |      | 5v      |     |     |
 |   2 |   8 |   SDA.1 | ALT0 | 1 |  3 || 4  |   |      | 5v      |     |     |
 |   3 |   9 |   SCL.1 | ALT0 | 1 |  5 || 6  |   |      | 0v      |     |     |
 |   4 |   7 | GPIO. 7 |   IN | 1 |  7 || 8  | 0 | IN   | TxD     | 15  | 14  |
 |     |     |      0v |      |   |  9 || 10 | 1 | IN   | RxD     | 16  | 15  |
 |  17 |   0 | GPIO. 0 |   IN | 0 | 11 || 12 | 0 | IN   | GPIO. 1 | 1   | 18  |
 |  27 |   2 | GPIO. 2 |   IN | 0 | 13 || 14 |   |      | 0v      |     |     |
 |  22 |   3 | GPIO. 3 |   IN | 0 | 15 || 16 | 0 | IN   | GPIO. 4 | 4   | 23  |
 |     |     |    3.3v |      |   | 17 || 18 | 0 | IN   | GPIO. 5 | 5   | 24  |
 |  10 |  12 |    MOSI |   IN | 0 | 19 || 20 |   |      | 0v      |     |     |
 |   9 |  13 |    MISO |   IN | 0 | 21 || 22 | 0 | IN   | GPIO. 6 | 6   | 25  |
 |  11 |  14 |    SCLK |   IN | 0 | 23 || 24 | 1 | IN   | CE0     | 10  | 8   |
 |     |     |      0v |      |   | 25 || 26 | 1 | IN   | CE1     | 11  | 7   |
 |   0 |  30 |   SDA.0 |   IN | 1 | 27 || 28 | 1 | IN   | SCL.0   | 31  | 1   |
 |   5 |  21 | GPIO.21 |   IN | 1 | 29 || 30 |   |      | 0v      |     |     |
 |   6 |  22 | GPIO.22 |   IN | 1 | 31 || 32 | 0 | IN   | GPIO.26 | 26  | 12  |
 |  13 |  23 | GPIO.23 |   IN | 0 | 33 || 34 |   |      | 0v      |     |     |
 |  19 |  24 | GPIO.24 |   IN | 0 | 35 || 36 | 0 | IN   | GPIO.27 | 27  | 16  |
 |  26 |  25 | GPIO.25 |   IN | 0 | 37 || 38 | 0 | IN   | GPIO.28 | 28  | 20  |
 |     |     |      0v |      |   | 39 || 40 | 0 | IN   | GPIO.29 | 29  | 21  |
 +-----+-----+---------+------+---+---Pi 4B--+---+------+---------+-----+-----+
 | BCM | wPi |   Name  | Mode | V | Physical | V | Mode | Name    | wPi | BCM |
 +-----+-----+---------+------+---+----++----+---+------+---------+-----+-----+
```

1. Led Yakma

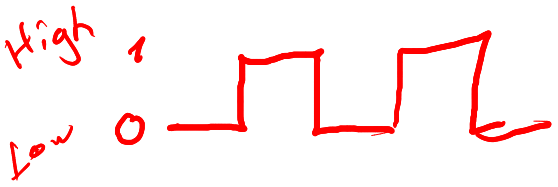
Hatırlatma: !!!







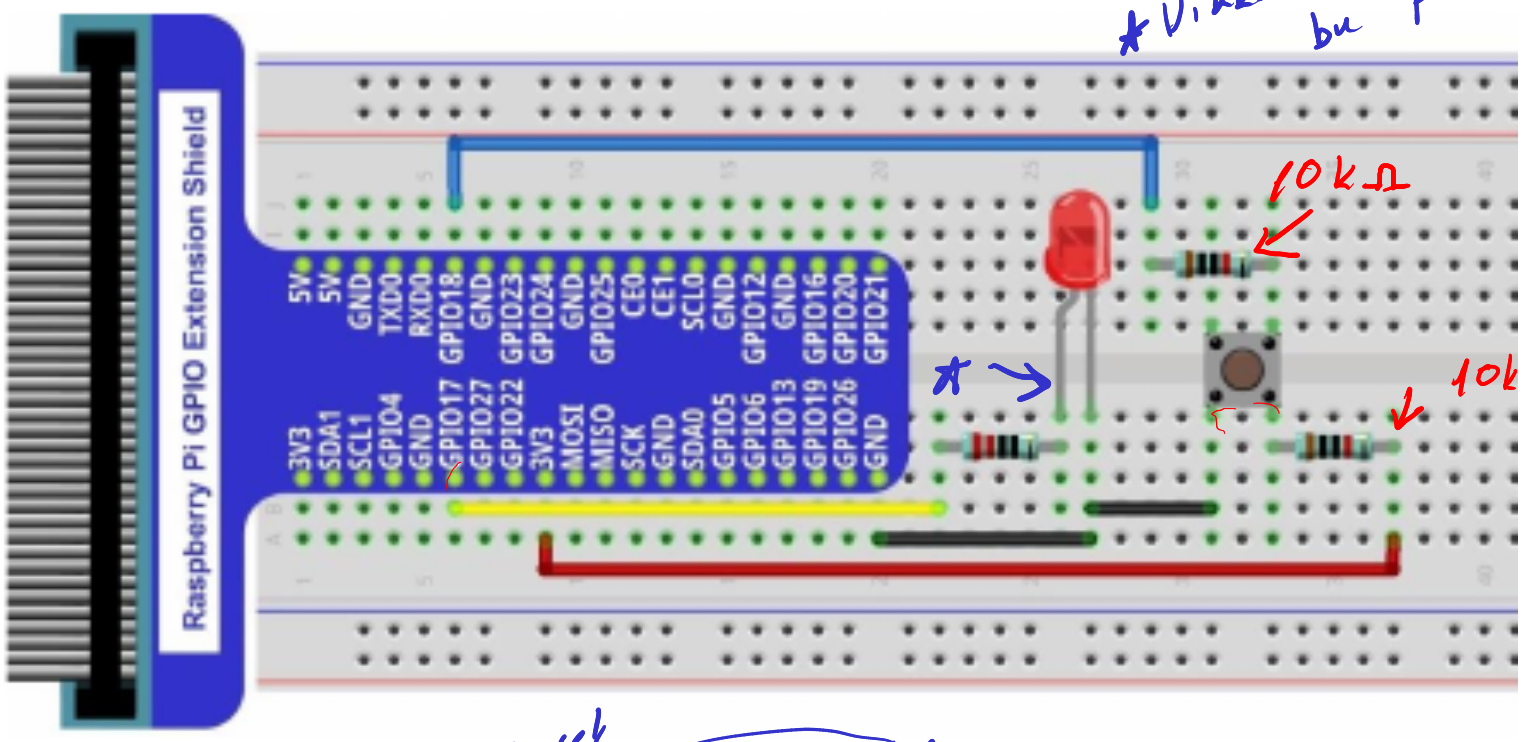
Gerekenler: 2x Jumper Kablo
1x 220Ω direng
1x Led

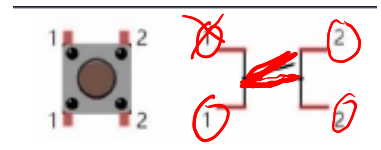


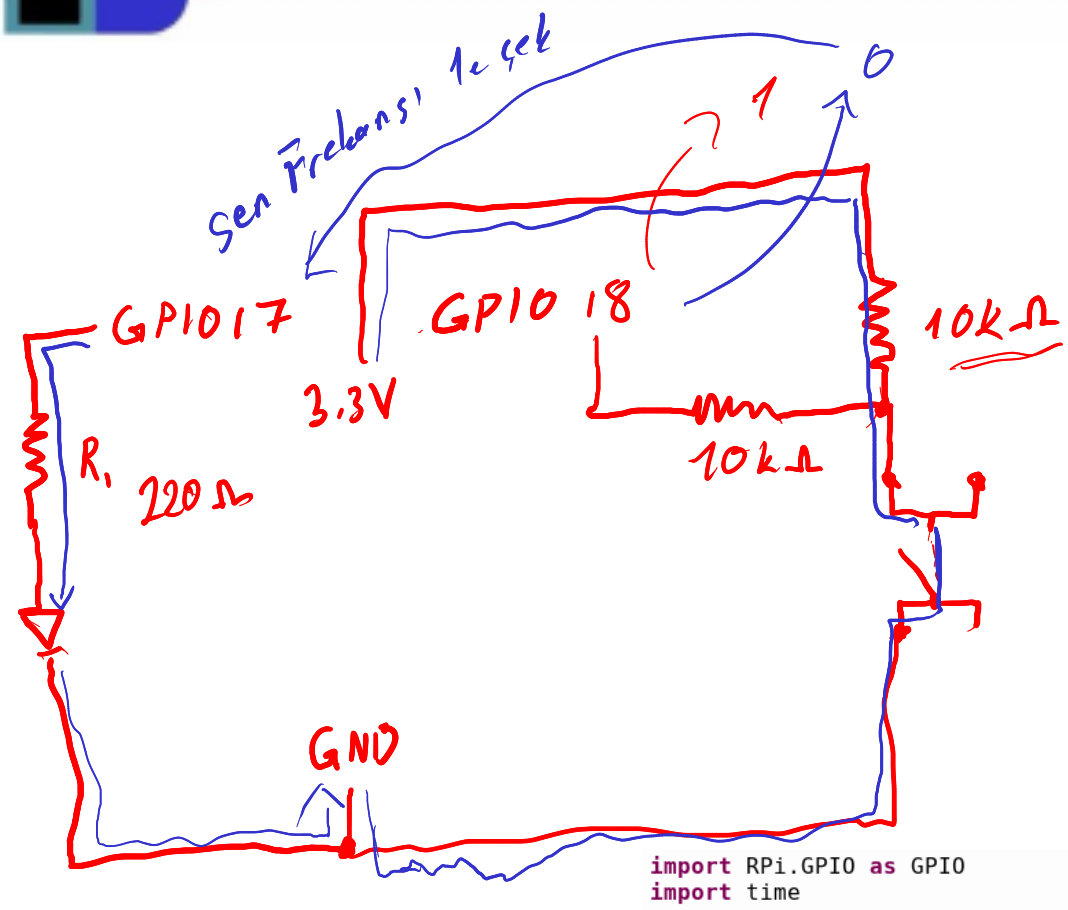

```python
import RPi.GPIO as GPIO
import time

ledPin = 11 # Fiziksel GPIO Pin tanimi

def kurulum():
    GPIO.setmode(GPIO.BOARD)            # GPIO Fiziksel modunda calistirir
    GPIO.setup(ledPin, GPIO.OUT)        # GPIO Pin kurulumu
    GPIO.output(ledPin, GPIO.LOW)       # Pin Düsük Frekansta baslasin
    print('Kurulum basladi. Kurulan pin: %d' %ledPin)

def dongu():
    while True:
        GPIO.output(ledPin, GPIO.HIGH)      # Led Pin Frekansini yukselt
        print(">>> LED Acilmistir!")
        time.sleep(1)
        GPIO.output(ledPin, GPIO.LOW)       # Led Pin Frekansini düsür
        print(">>> LED Kapanmistir!")
        time.sleep(1)


def bitis():
    GPIO.cleanup()                      # GPIO Cikislarini sifirlar


if __name__ == '__main__':               # Programi baslatan Parametre
    print("PROGRAM BASLIYOR!")
    kurulum()
    try:
        dongu()
    except KeyboardInterrupt:           # Klavye ile CTRL+C müdahalesi sirasinda
        bitis()
```

2. Button ile Led Yakma

Gerekenler: 5x Jumper Kablo
1x Button
1x Led
1x 220 Ω Direnç
2x 10k Ω Direnç



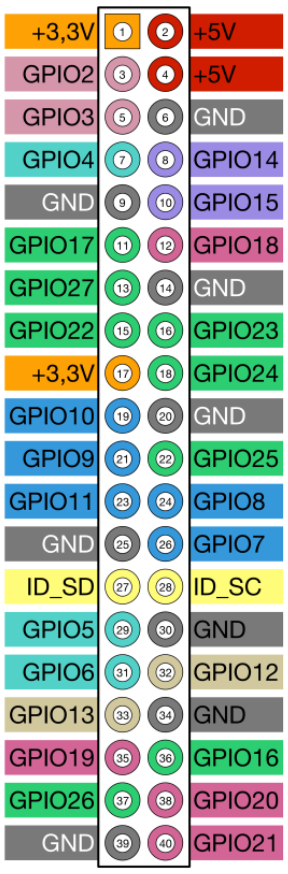


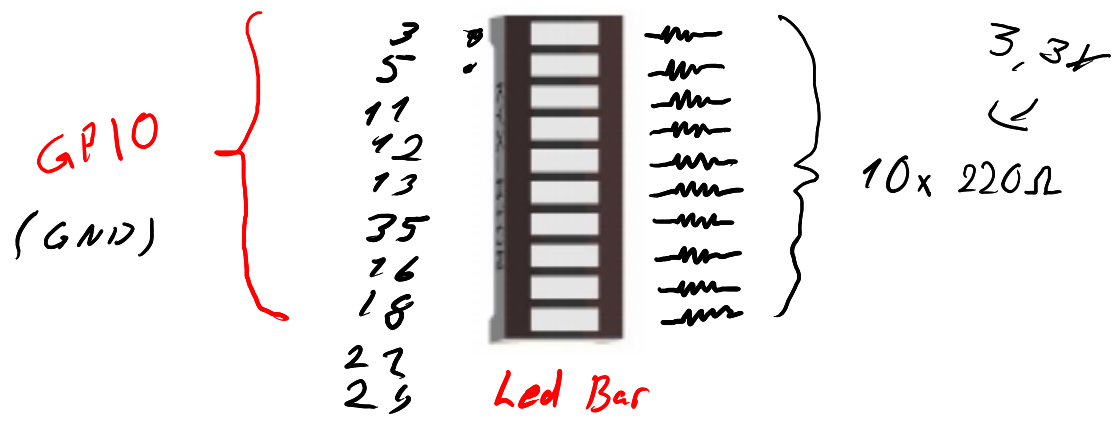


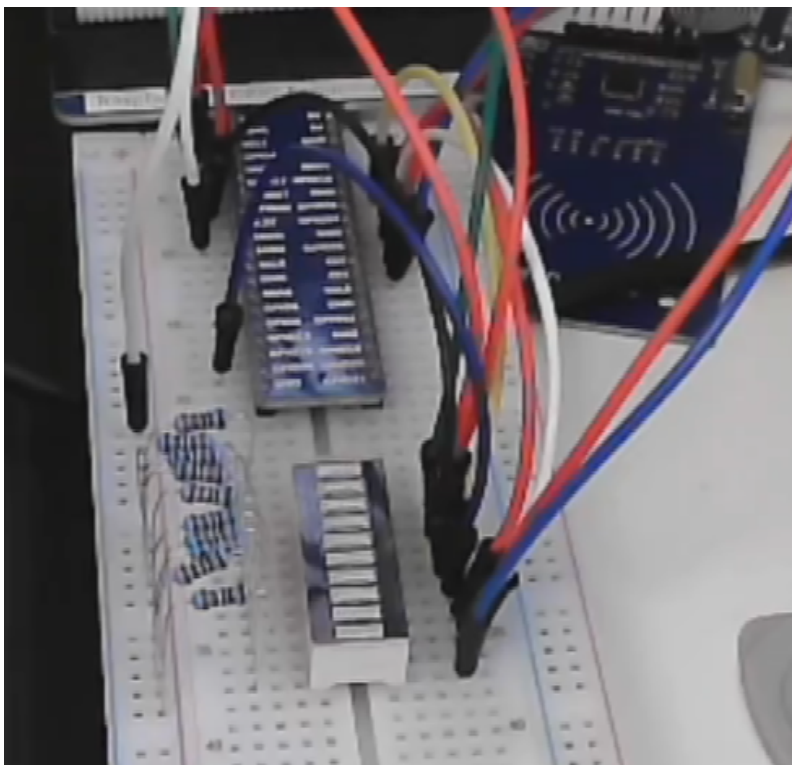

```python
import RPi.GPIO as GPIO
import time

ledPin = 11 # Fiziksel GPIO Pin tanimi
btnPin = 12 # Fiziksel GPIO Button Pin Tanimi

def kurulum():
    GPIO.setmode(GPIO.BOARD)            # GPIO Fiziksel modunda calistirir
    GPIO.setup(ledPin, GPIO.OUT)        # GPIO Pin kurulumu
    GPIO.setup(btnPin, GPIO.IN, pull_up_down=GPIO.PUD_UP) # GPIO Pinini bas kaldir moduna sokacak
    print('Kurulum basladi.')

def dongu():
    while True:
        if GPIO.input(btnPin) == GPIO.LOW:
            GPIO.output(ledPin, GPIO.HIGH) # Ledi yak
            print(">>> LED yaniyor")
        else: # Diger button durumu
            GPIO.output(ledPin, GPIO.LOW)
            print(">>> LED Yanmiyor")


def bitis():
    GPIO.cleanup()                      # GPIO Cikislarini sifirlar


if __name__ == '__main__':              # Programi baslatan Parametre
    print("PROGRAM BASLIYOR!")
    kurulum()
    try:
        dongu()
    except KeyboardInterrupt:           # Klavye ile CTRL+C müdahalesi sirasinda
        bitis()
```

3. Led Bari Yakma

Gerekenler: 10x 220Ω Direng
11x Jumper Kablo
1x Led Bari

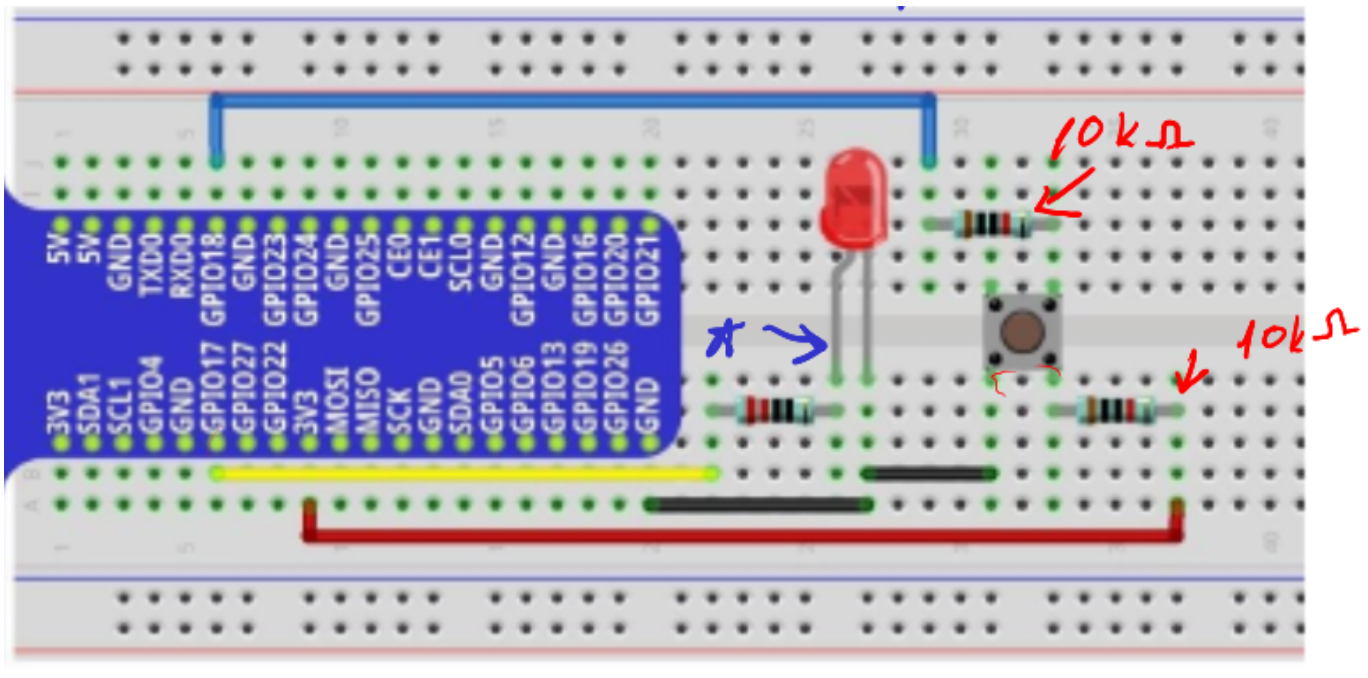






```python
import RPi.GPIO as GPIO
import time

ledPin = [3, 5, 11, 12, 13, 35, 16, 18, 22, 24] # Fiziksel GPIO Pin tanimi

def kurulum():
    GPIO.setmode(GPIO.BOARD)            # GPIO Fiziksel modunda calistirir
    GPIO.setup(ledPin, GPIO.OUT)        # GPIO Pin kurulumu
    GPIO.output(ledPin, GPIO.HIGH)      # Tüm ledleri söndürmek icin Yüksek Frekans
    print('Kurulum basladi.')

def dongu():
    while True:
        for pin in ledPin:
            GPIO.output(pin, GPIO.LOW)
            time.sleep(0.1)
        for pin in ledPin:
            GPIO.output(pin, GPIO.HIGH)
            time.sleep(0.1)

def bitis():
    GPIO.cleanup()                      # GPIO Cikislarini sifirlar


if __name__ == '__main__':              # Programi baslatan Parametre
    print("PROGRAM BASLIYOR!")
    kurulum()
    try:
        dongu()
    except KeyboardInterrupt:           # Klavye ile CTRL+C müdahalesi sirasinda
        bitis()
```

4. Led Buton V2




```python
import RPi.GPIO as GPIO
import time

ledPin = 11 # Fiziksel GPIO Pin tanimi
btnPin = 12 # Fiziksel GPIO Button Pin Tanimi
ledDurum = False    # Led Yanmiyor durumu

def kurulum():
    GPIO.setmode(GPIO.BOARD)             # GPIO Fiziksel modunda calistirir
    GPIO.setup(ledPin, GPIO.OUT)         # GPIO Pin kurulumu
    GPIO.setup(btnPin, GPIO.IN, pull_up_down=GPIO.PUD_UP) # GPIO Pinini bas kaldir moduna sokacak
    print('Kurulum basladi.')

def butonIslem(channel): # Buttona basildiginda bu fonksiyon calisacaktir
    global ledDurum
    print('Buton Islem GPIO Durumu:%d' %channel)
    ledDurum = not ledDurum   # Her tiklamada durumu tersine cevirecek (AC/KAPA = TRUE/FALSE)

    if ledDurum:
        print("Led Acik")
    else:
        print("Led Kapali")

    GPIO.output(ledPin, ledDurum)

def dongu():
    GPIO.add_event_detect(btnPin, GPIO.FALLING, callback=butonIslem, bouncetime=300) # Buttona basil
    while True:
        pass # Programin acik kalmasini saglayan sonsuz pass döngüsü


def bitis():
    GPIO.cleanup()                       # GPIO Cikislarini sifirlar

if __name__ == '__main__':               # Programi baslatan Parametre
    print("PROGRAM BASLIYOR!")
    kurulum()
    try:
        dongu()
    except KeyboardInterrupt:            # Klavye ile CTRL+C müdahalesi sirasinda
        bitis()
```