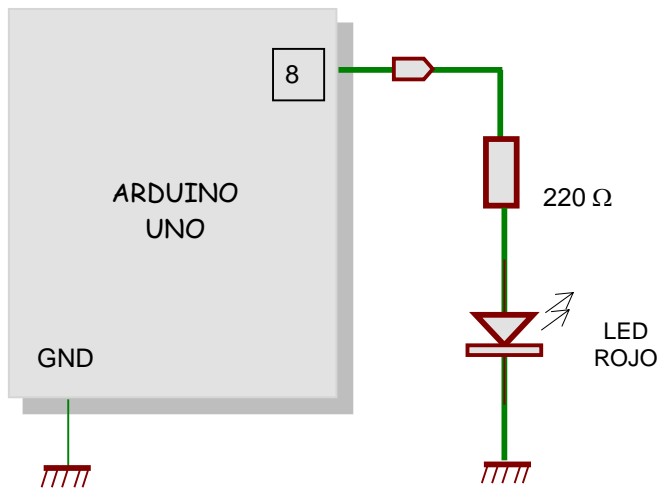
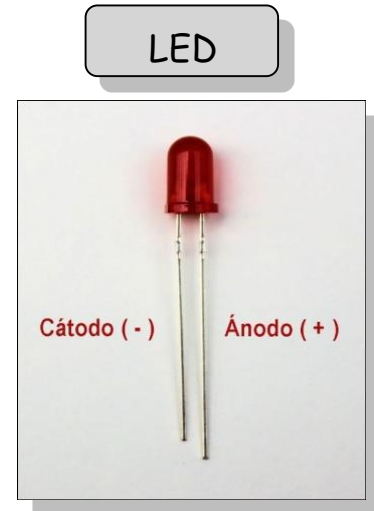


## LED INTERMITENTE

### CIRCUITO ELÉCTRICO



▭ Puerto 8 ( salida al led rojo )



### MATERIALES

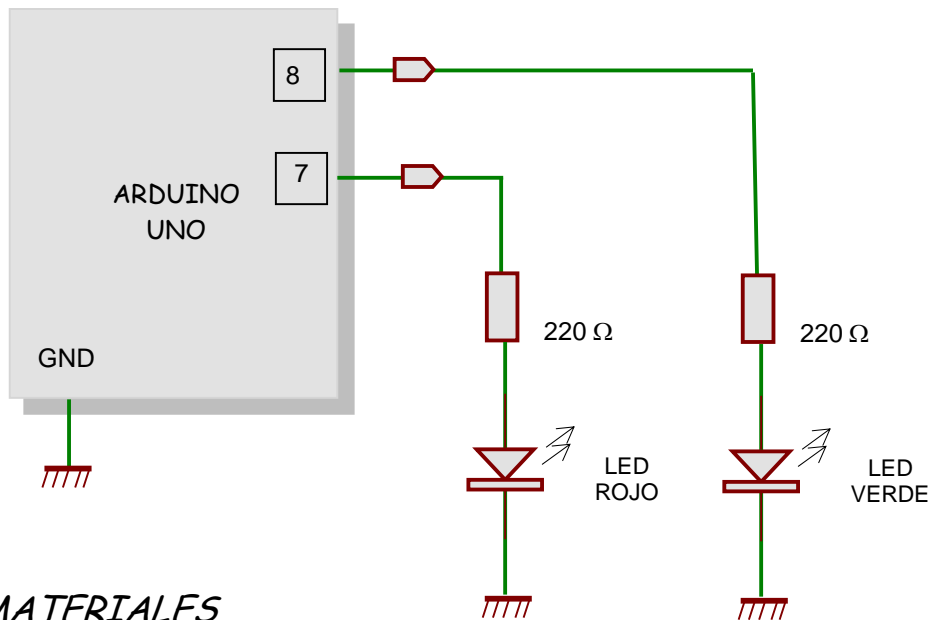
ARDUINO UNO  
PROTOBOARD  
LED ROJO  
DOS CONECTORES  
CABLE USB

### PROGRAMA

```
void setup ( ) {  
    pinMode ( 8, OUTPUT ) ;  
}  
  
void loop ( ) {  
    digitalWrite( 8, HIGH ) ;  
    delay ( 1000 ) ;  
    digitalWrite ( 8, LOW ) ;  
    delay (1000) ;  
}
```



### CIRCUITO ELÉCTRICO



### MATERIALES

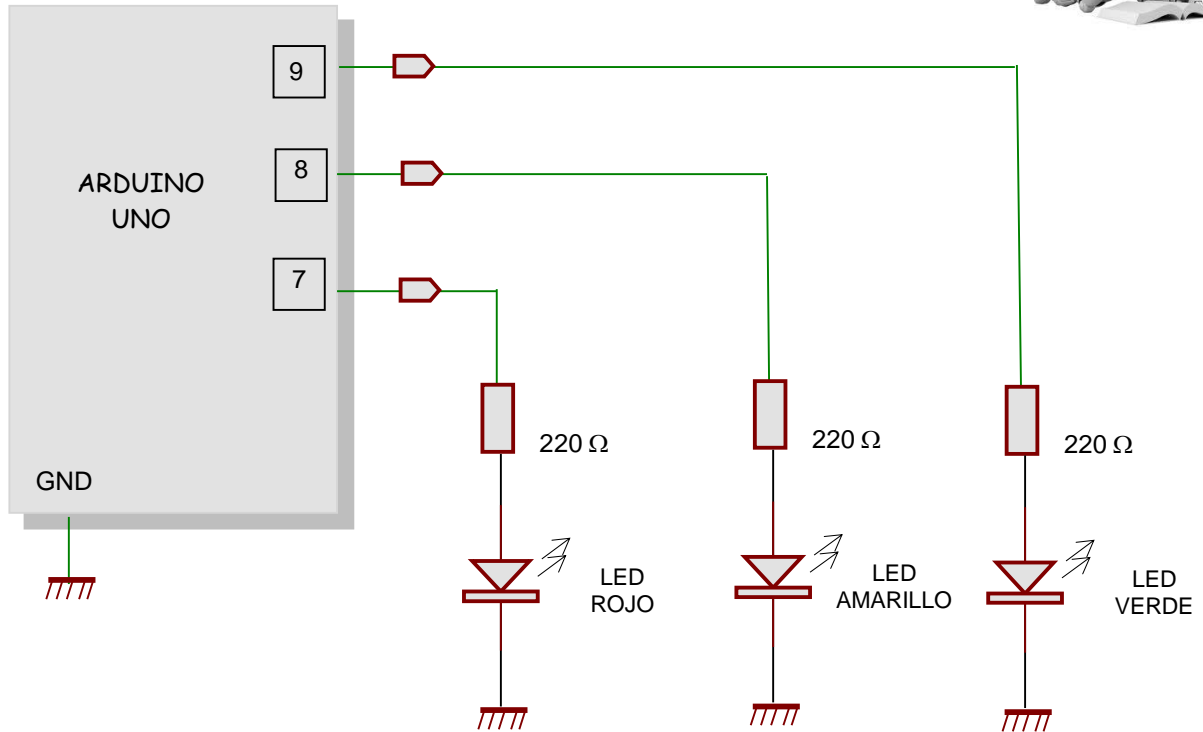
ARDUINO UNO  
PROTOBOARD  
LED ROJO  
LED VERDE  
CONECTORES  
CABLE USB



### PROGRAMA

```
void setup () {  
    pinMode ( 8, OUTPUT ) ;  
    pinMode ( 7, OUTPUT ) ;  
}  
  
void loop () {  
    digitalWrite( 7, HIGH ) ;  
    digitalWrite ( 8, LOW ) ;  
    delay ( 1000 ) ;  
    digitalWrite ( 7, LOW ) ;  
    digitalWrite ( 8, HIGH ) ;  
    delay ( 1000 ) ;  
}
```

### CIRCUITO ELÉCTRICO



### SUB - PROGRAMAS

```
void rojo () {
    digitalWrite ( 7,HIGH) ;
    digitalWrite ( 8, LOW) ;
    digitalWrite ( 9, LOW) ;
}

void verde () {
    digitalWrite( 7, LOW ) ;
    digitalWrite ( 8, LOW ) ;
    digitalWrite ( 9, HIGH ) ;
}

void amarillo () {
    digitalWrite ( 7, LOW ) ;
    digitalWrite ( 8, HIGH ) ;
    digitalWrite ( 9, LOW ) ;
}
```

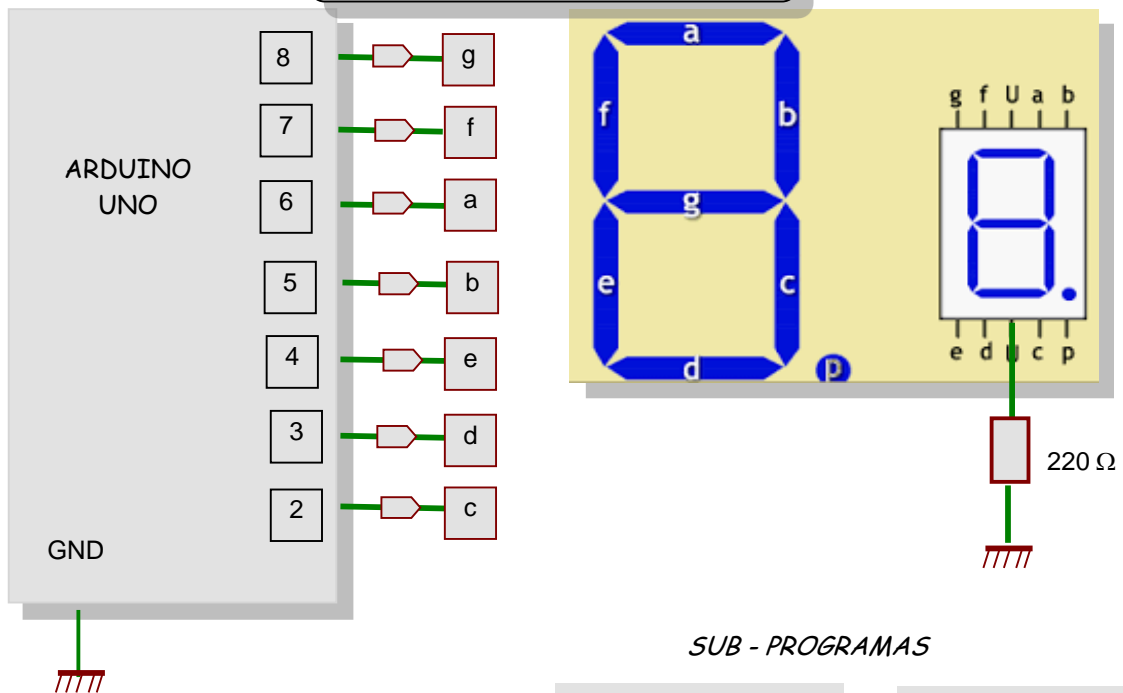
### PROGRAMA

```
void setup () {
    pinMode ( 9, OUTPUT ) ;
    pinMode ( 8, OUTPUT) ;
    pinMode ( 7, OUTPUT ) ;
}

void loop () {
    rojo () ;
    delay ( 1000 ) ;
    amarillo () ;
    delay ( 1000 ) ;
    verde () :
    delay (1000) ;
    amarillo () ;
    delay ( 1000 ) ;
}
```

## CONTADOR DISPLAY DE SIETE SEGMENTOS

### CIRCUITO ELÉCTRICO



### PROGRAMA

```
void setup () {
  pinMode ( 8, OUTPUT );
  pinMode ( 7, OUTPUT );
  :
  pinMode ( 2, OUTPUT );
}
void loop () {
  cero ();
  borrar ();
  uno ();
  borrar ();
  dos ();
  borrar ();
  tres ();
  borrar ();
  cuatro ();
  cinco ();
  seis ();
  siete ();
  ocho ();
  nueve ();
}
```

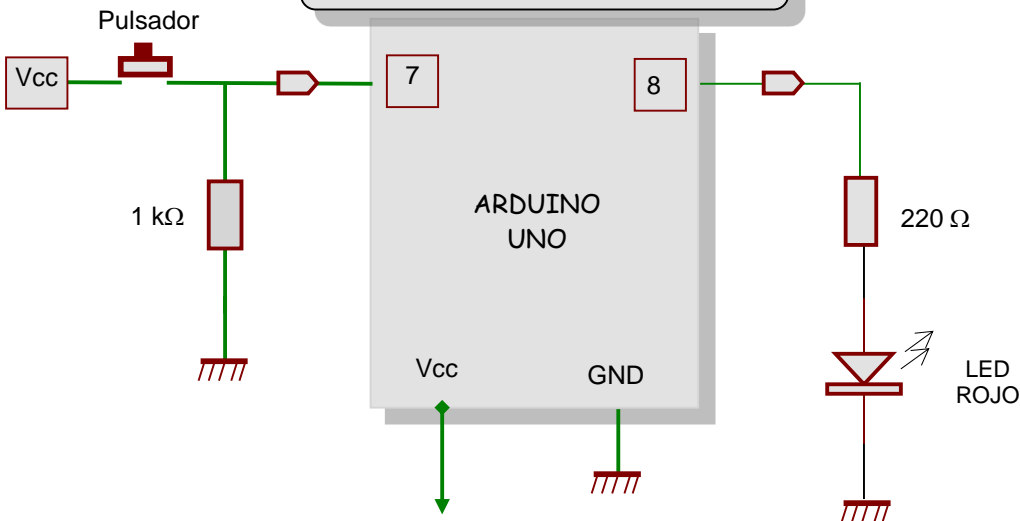
### SUB - PROGRAMAS

```
void borrar () {
  digitalWrite(2,0);
  digitalWrite(3,0);
  digitalWrite(4,0);
  :
  digitalWrite(8,0);
}
void cero () {
  digitalWrite(8,0);
  digitalWrite(2,1);
  digitalWrite(3,1);
  :
  digitalWrite(7,1);
  delay(1000);
}
void uno () {
  digitalWrite(5,1);
  digitalWrite(2,1);
  delay(1000);
}
```

```
void dos () {
  digitalWrite(6,1);
  digitalWrite(5,1);
  digitalWrite(8,1);
  digitalWrite(4,1);
  digitalWrite(3,1);
  delay(1000);
}
void tres () {
  digitalWrite(6,1);
  digitalWrite(5,1);
  digitalWrite(8,1);
  digitalWrite(2,1);
  digitalWrite(3,1);
  delay(1000);
}
void cuatro () {
  digitalWrite(5,1);
  digitalWrite(2,1);
  digitalWrite(7,1);
  digitalWrite(8,1);
  delay(1000);
}
void cinco () {
  :
}
```

## ENCENDER UN LED CON UN PULSADOR

### CIRCUITO ELÉCTRICO



### MATERIALES

ARDUINO UNO  
 PROTOBOARD  
 LED ROJO  
 PULSADOR  
 CONECTORES  
 RESISTENCIA 1 KΩ  
 RESISTENCIA 220 Ω  
 CABLE USB

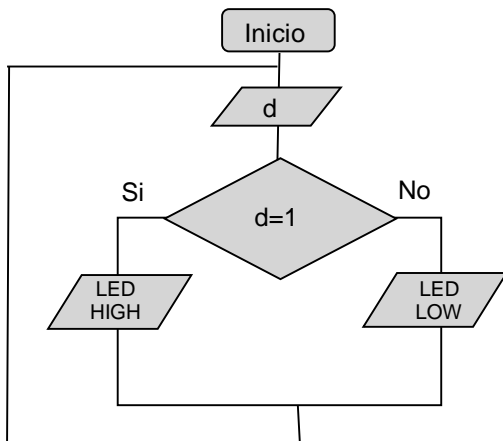
### PROGRAMA

```

int d;
void setup () {
  pinMode ( 8, OUTPUT ) ;
  pinMode ( 7, INPUT ) ;
}

void loop () {
  d = digitalRead ( 7 ) ;
  if ( d == HIGH ) {
    digitalWrite ( 8, HIGH ) ;
    delay (1000);
  }
  digitalWrite ( 8, LOW ) ;
}
  
```

### DIAGRAMA DE FLUJO

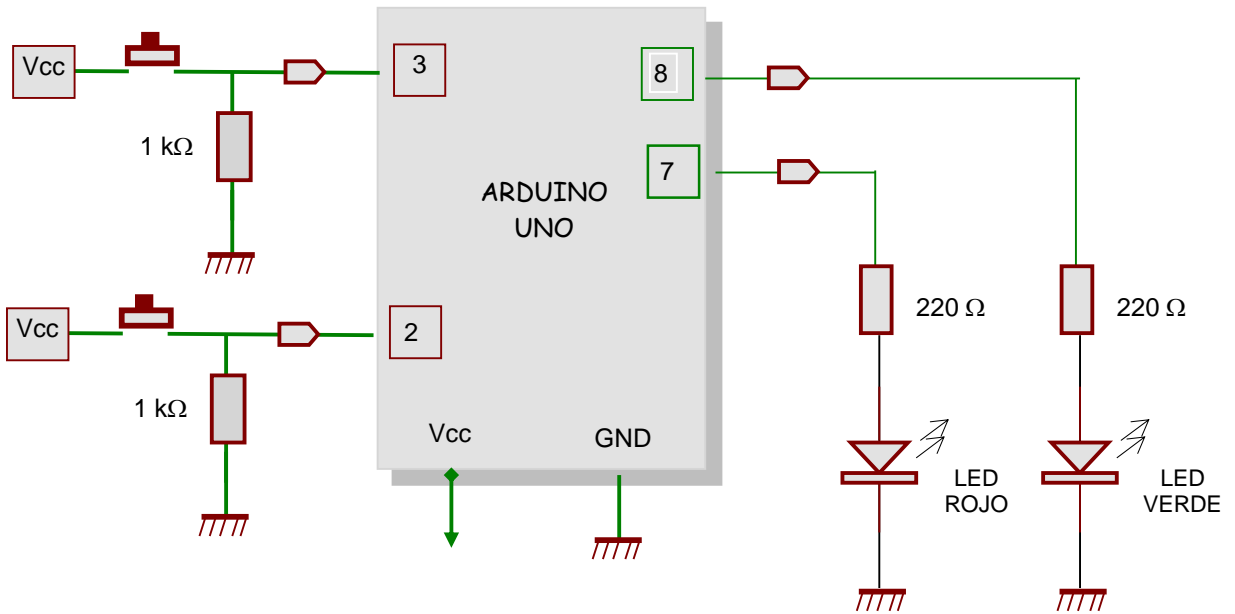


PULSADOR

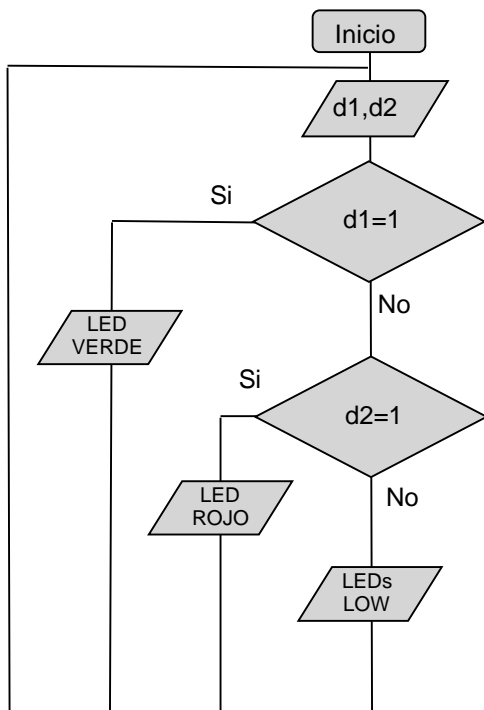


## ENCENDER DOS LEDs CON DOS PULSADORES

### CIRCUITO ELÉCTRICO



### DIAGRAMA DE FLUJO



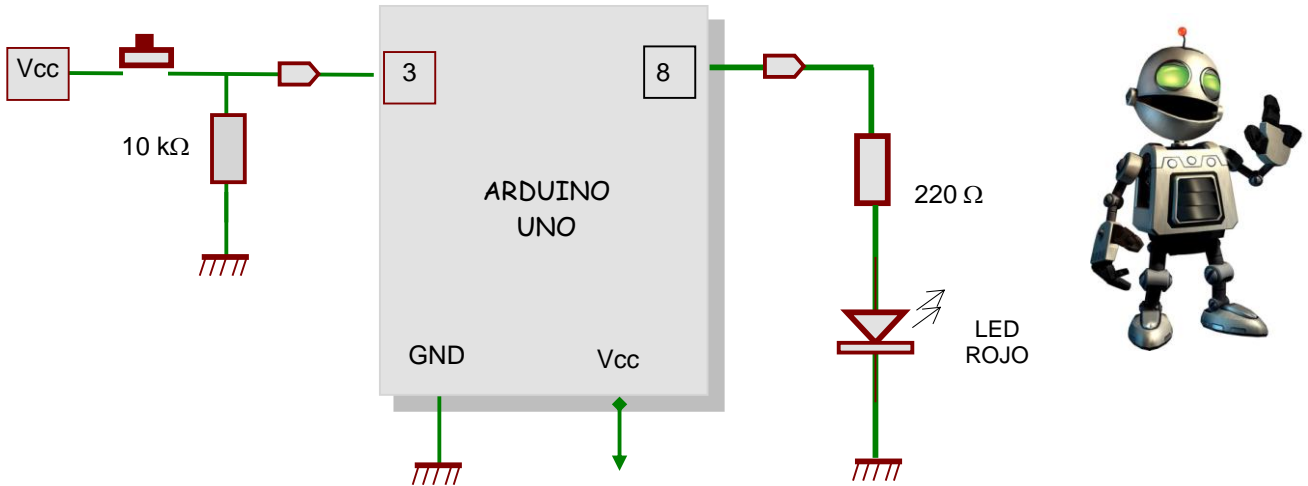
### PROGRAMA

```

int d1;
int d2;
void setup ( ) {
  pinMode ( 8, OUTPUT );
  pinMode ( 7, OUTPUT );
  pin mode ( 2, INPUT );
  pinMode ( 3, INPUT );
}
void loop ( ) {
  d1 = digitalRead ( 3 );
  d2 = digitalRead ( 2 );
  if ( d1 == HIGH ) {
    digitalWrite ( 8, HIGH );
    delay ( 1000 );
  }
  if ( d2 == HIGH ) {
    digitalWrite(7,HIGH);
    delay(1000);
  }
  digitalWrite(7,LOW);
  digitalWrite(8,LOW);
}
  
```

## LECTURA SERIAL DE UNA ENTRADA DIGITAL

### CIRCUITO ELÉCTRICO



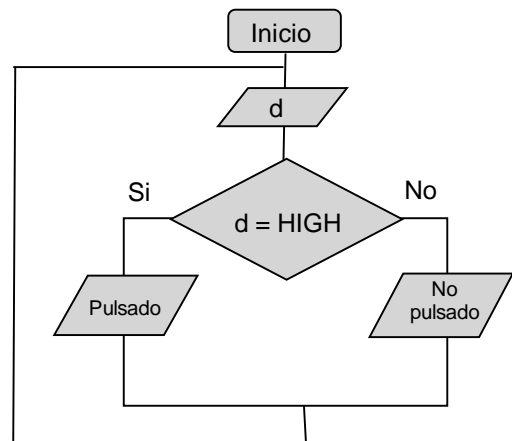
### PROGRAMA

```
int d;

void setup () {
  pinMode ( 8, OUTPUT );
  pinMode ( 3, INPUT );
  Serial.begin (9600);
}

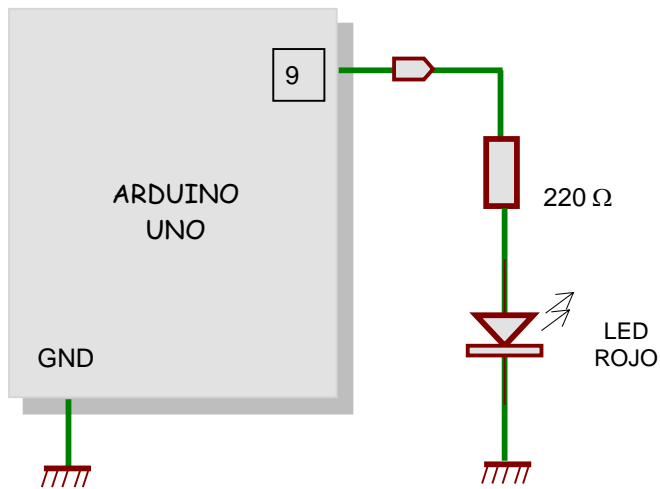
void loop () {
  d = digitalRead (3);
  if ( d == HIGH ) {
    Serial.println("Pulsado");
    digitalWrite ( 8, HIGH );
    delay (1000);
  }
  else {
    Serial.println("No pulsado");
    digitalWrite(8,LOW);
  }
}
}
```

### DIAGRAMA DE FLUJO

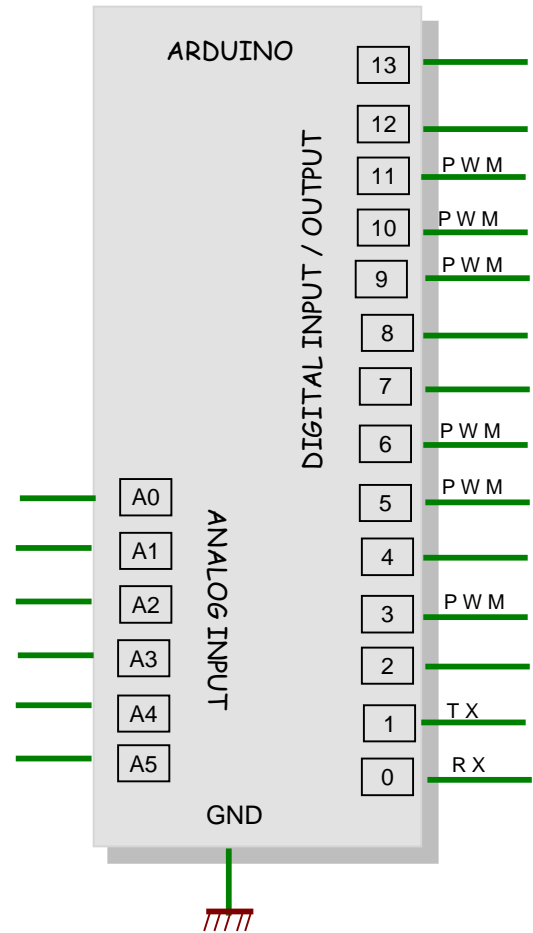


## ENCENDER UN LED POR PWM

### CIRCUITO ELÉCTRICO



### PUERTOS PWM ARDUINO UNO

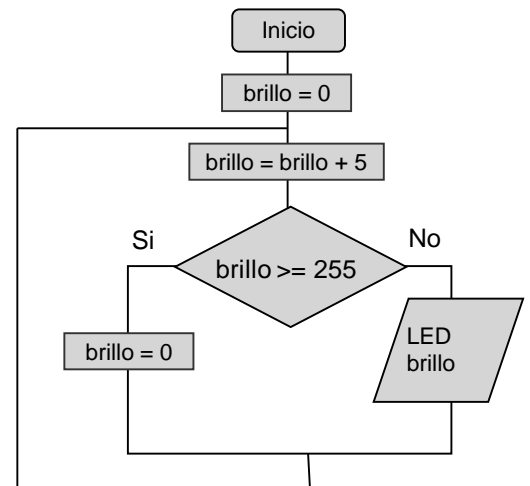


### PROGRAMA

```
int brillo=0;

void setup () {
    pinMode ( 9, OUTPUT ) ;
}

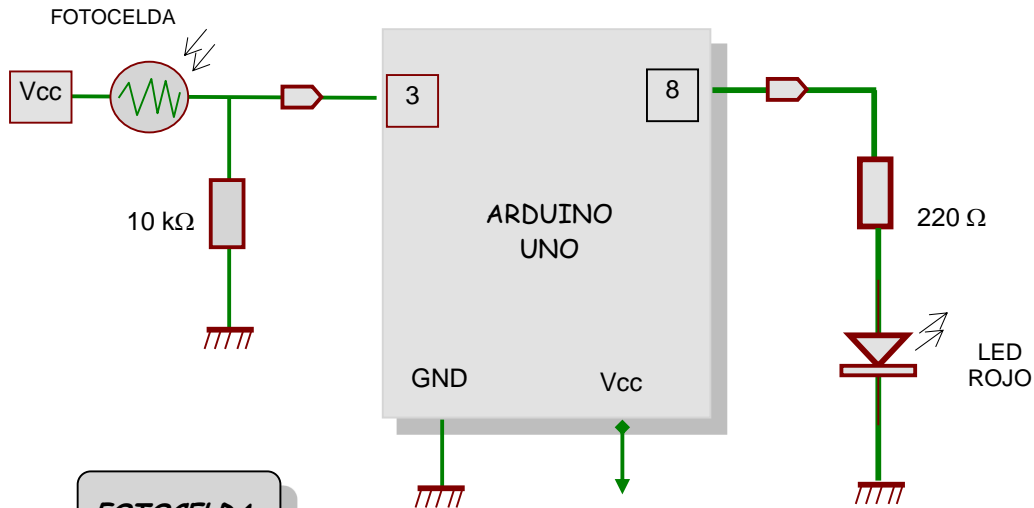
void loop () {
    brillo=brillo + 5;
    if (brillo >= 255) {
        brillo=0;
    }
    analogWrite(9,brillo);
    delay (200);
}
```





## CONTROL DE UN LED CON UNA FOTOCELDA

### CIRCUITO ELÉCTRICO



FOTOCELDA



### PROGRAMA

```

int d;

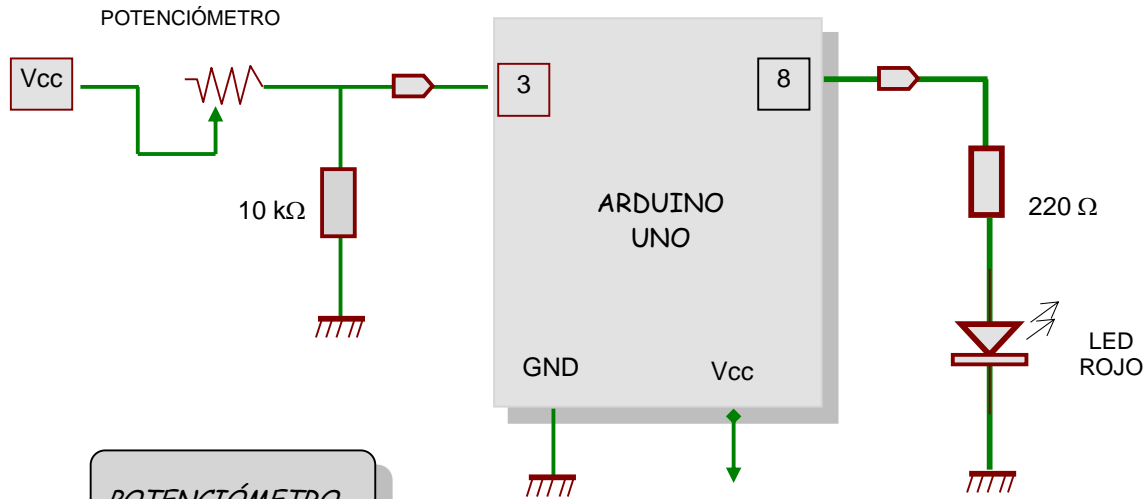
void setup () {
  pinMode ( 8, OUTPUT ) ;
  pinMode ( 3, INPUT ) ;
  Serial.begin (9600);
}

void loop () {
  d = digitalRead (3);
  if ( d == HIGH ) {
    Serial.println("Luz");
    digitalWrite ( 8, HIGH ) ;
    delay (1000);
  }
  else {
    Serial.println("No Luz");
    digitalWrite(8,LOW);
  }
}
    
```



## CONTROL DE UN LED CON UN POTENCIÓMETRO

### CIRCUITO ELÉCTRICO



POTENCIÓMETRO

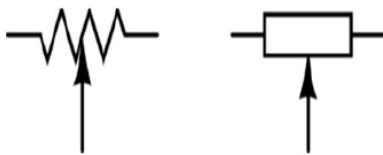
### PROGRAMA

```

int d;

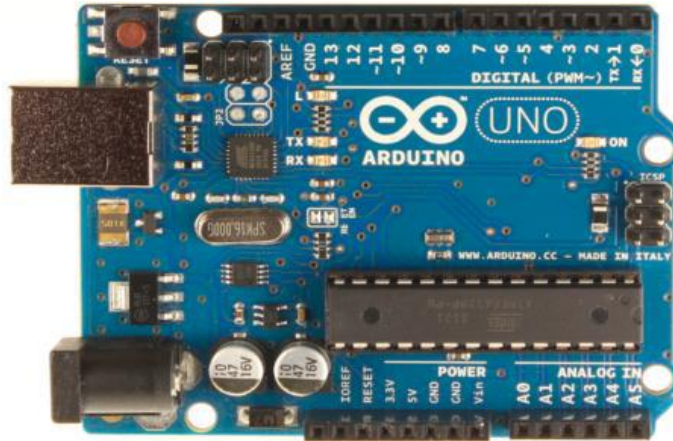
void setup () {
  pinMode ( 8, OUTPUT );
  pinMode ( 3, INPUT );
  Serial.begin (9600);
}

void loop () {
  d = digitalRead (3);
  if ( d == HIGH ) {
    Serial.println("Disminuir");
    digitalWrite ( 8, HIGH );
    delay (1000);
  }
  else {
    Serial.println("Aumentar");
    digitalWrite(8,LOW);
  }
}
    
```

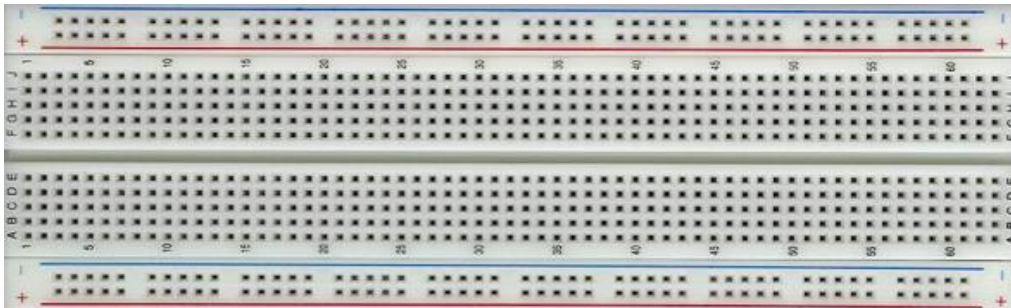


# MATERIALES

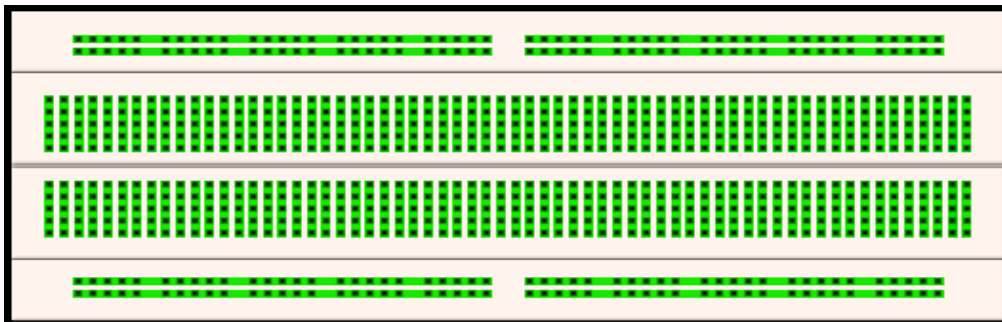
ARDUINO UNO



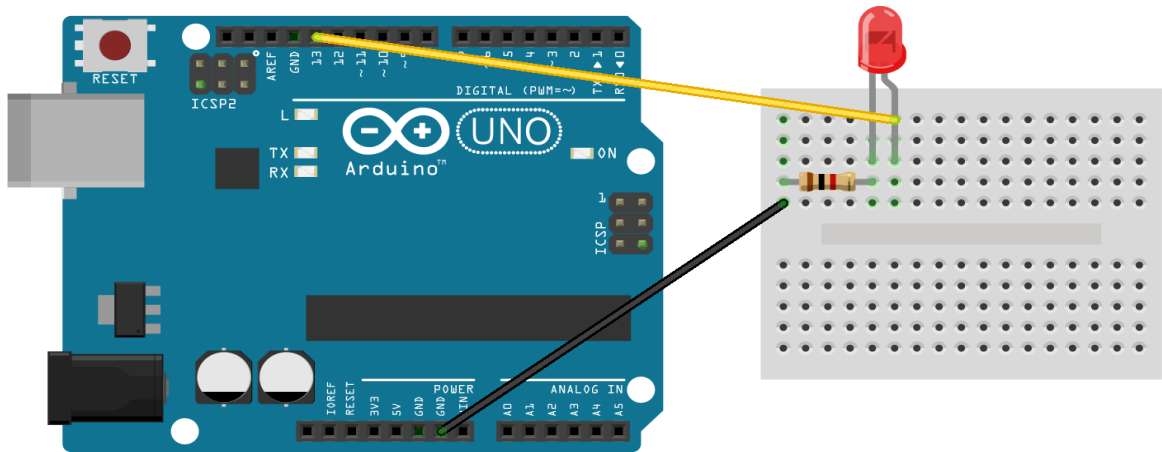
PROTOBOARD



CONEXIONES INTERNAS



## CIRCUITO ELÉCTRICO



## ENTORNO DE TRABAJO

```
sketch_nov12a Arduino 1.6.4
Archivo Editar Programa Herramientas Ayuda
sketch_nov12a
void setup() {
  // put your setup code here, to run once:
}
void loop() {
  // put your main code here, to run repeatedly:
}
9 Arduino Mega or Mega 2560, ATmega2560 (Mega 2560) on COM8
```























