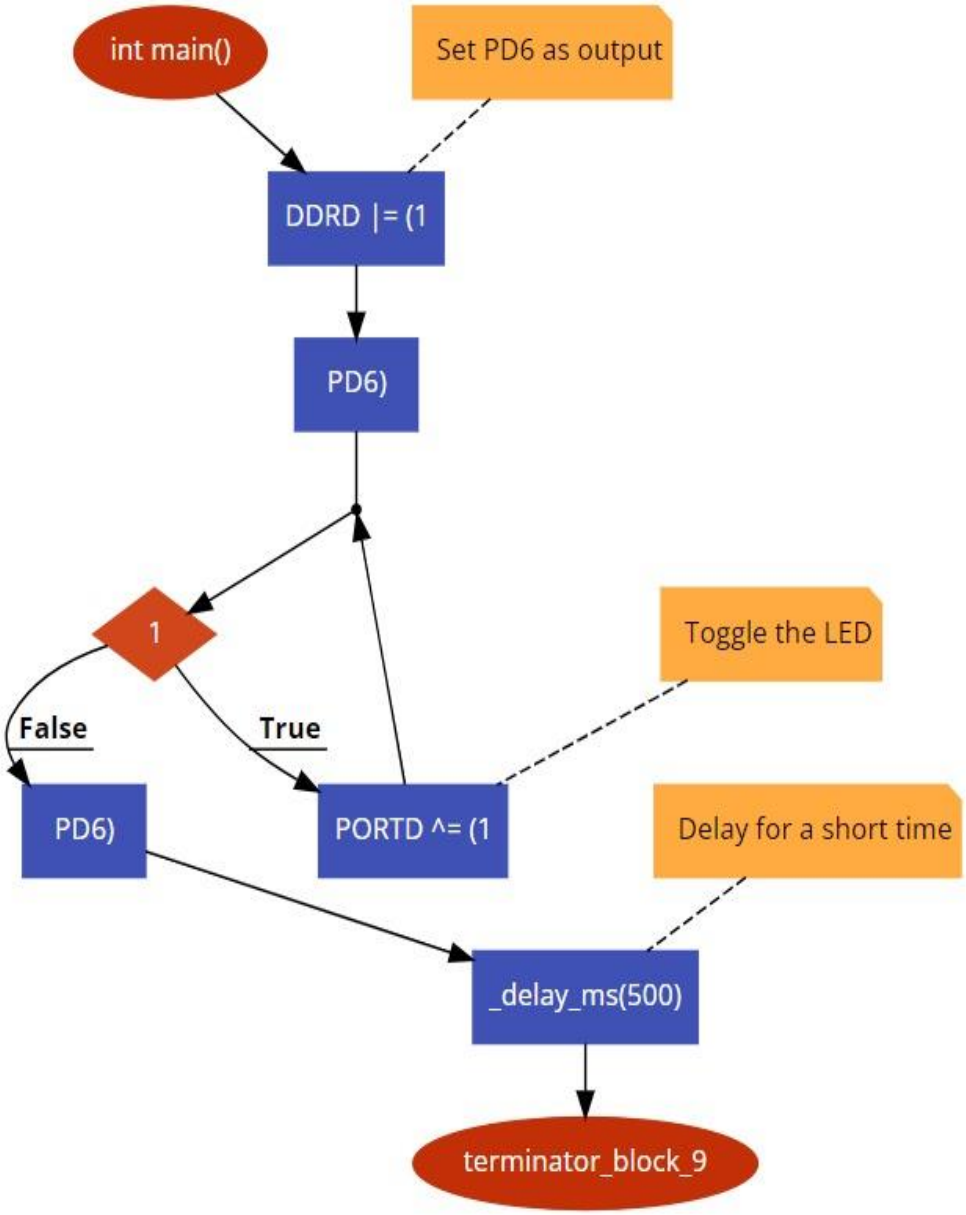
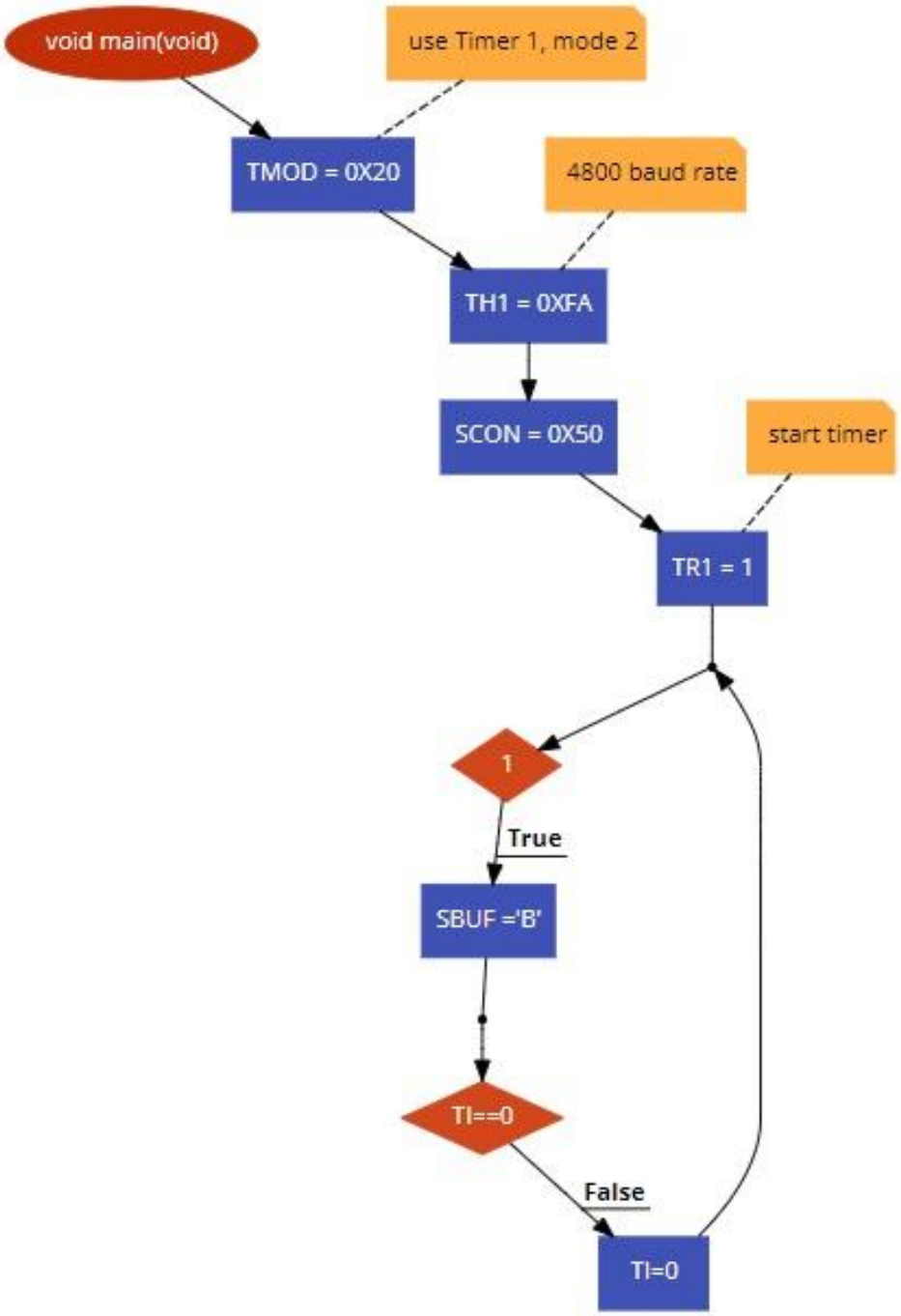
FLOWCHARTS AND SCHEMATICS

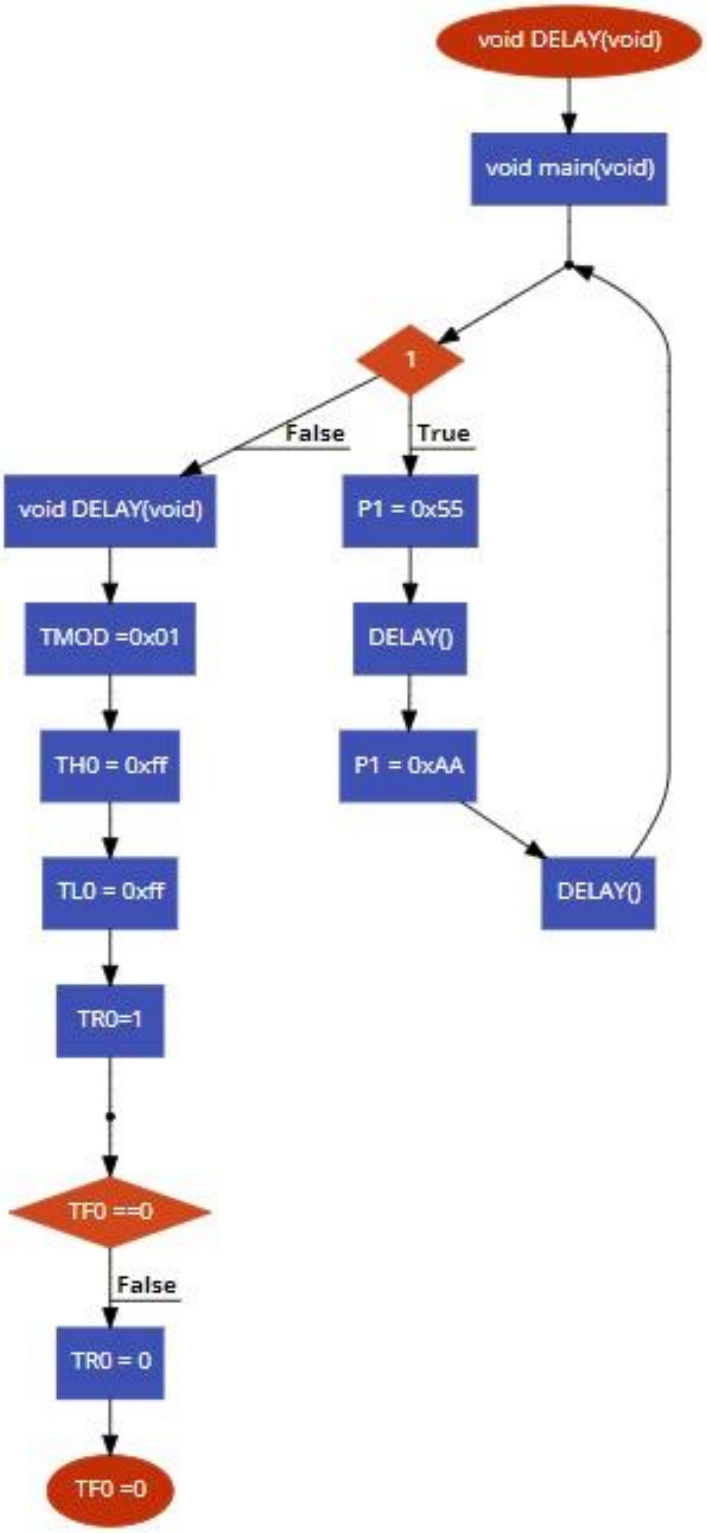
Bare-Metal LED Toggle



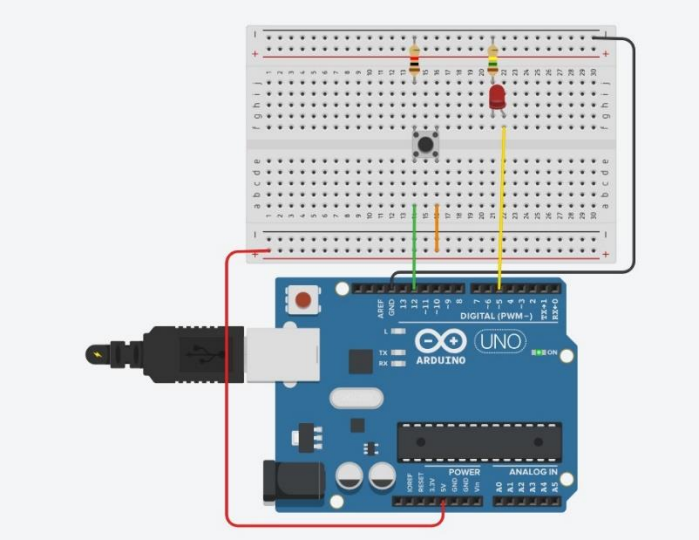
Serial Communication



Timer

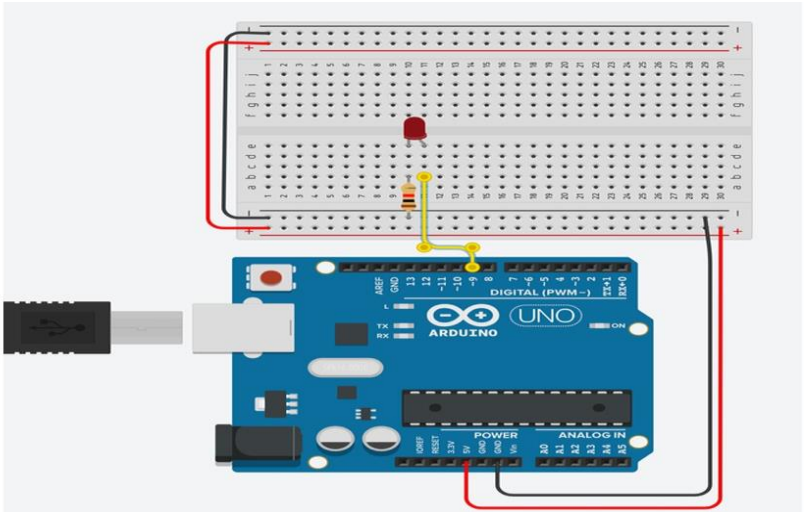

void DELAY(void)
void main(void)
1
False
True
void DELAY(void)
P1 = 0x55
TMOD =0x01
DELAY()
TH0 = 0xff
P1 = 0xAA
TL0 = 0xff
DELAY()
TR0=1
TF0 ==0
False
TR0 = 0
TF0 =0

Toggle switch




```
const int inPin = 12;//Correct way of connection (1m)
const int outPin = 5;//Correct way of connection (1m)
int currentState = LOW;
int previousState = LOW;
int outState = LOW;
void setup(){
  pinMode(inPin,INPUT); //correct pinMode (1m)
  pinMode(outPin,OUTPUT); //correct pinMode (1m)
}
void loop(){ //fully function (5 tick = 5m)
  currentState = digitalRead(inPin); // 1 tick
  if((currentState == HIGH) && (previousState == LOW)){ // 2 tick
    if(outState==LOW) //1 tick
      outState = HIGH;
    else
      outState = LOW;
  } previousState = currentState;
  digitalWrite(outPin,outState); //1 tick
  delay(10);
}
```

Analog output



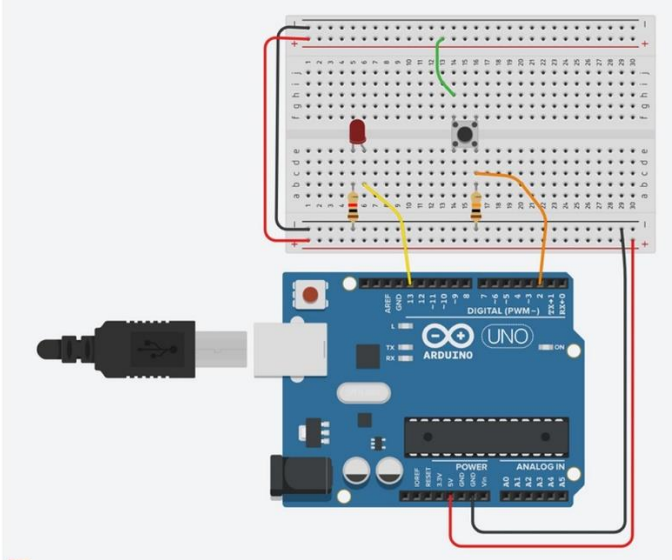

```
int brightness = 0;
 void setup()
{
  pinMode(9, OUTPUT);
}
```

The main body of the program starts out by creating a variable called brightness and sets it equal to zero, then inside the setup() pin 9 is

initialized as an output.

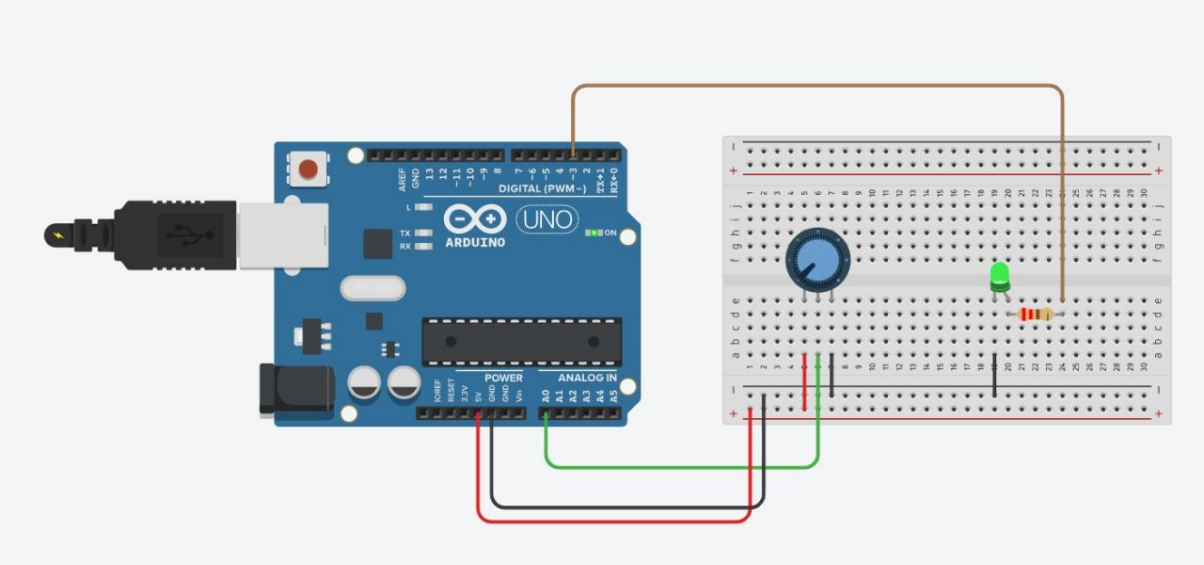
```
 void loop()
{
  for (brightness = 0; brightness <= 255; brightness += 5) {
    analogWrite(9, brightness);
    delay(30); // Wait for 30 millisecond(s)
  }
  for (brightness = 255; brightness >= 0; brightness -= 5) {
    analogWrite(9, brightness);
    delay(30); // Wait for 30 millisecond(s)
  }
}
```

Digital Input



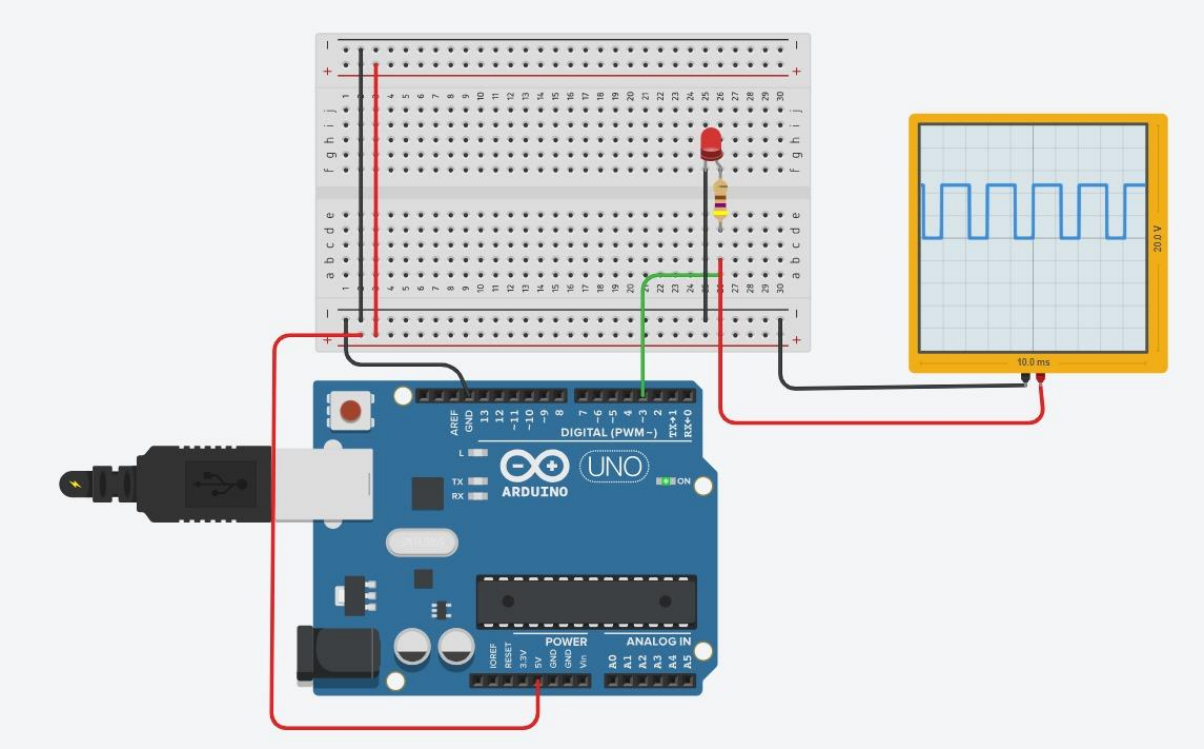

```
int buttonState = 0;
 void setup()
{
 pinMode(2, INPUT);
 pinMode(13, OUTPUT);
}
 void loop()
{
 // read the state of the pushbutton
 buttonState = digitalRead(2);
 // check if pushbutton is pressed. if it is, the
 // button state is HIGH
 if (buttonState == HIGH) {
   digitalWrite(13, HIGH);
 } else {
   digitalWrite(13, LOW);
 }
 delay(10); // Delay a little bit to improve simulation performance
}
```

LED Control Using Potentiometer




```
const int led = 3;

const int pot = 0;

int potValue;

int brightness;


void setup()

{

  pinMode(led, OUTPUT);

}

void loop()

{

  potValue = analogRead(pot);

  brightness = map(potValue, 0, 1023, 0, 255);

  analogWrite(led, brightness);

}
```

Analog Output




```
void setup()
{
}
void loop()
{
  for(int i=0; i<255; i +=10)
  {
    analogWrite(LED_PIN, i);
    delay(300);
  }
  for(int i=255; i>0; i-=10)
  {
    analogWrite(LED_PIN, i);
    delay(300);
  }

}
```