



مه گگوتەك ئىككىنچى سىنىپ

بەشىنچى دەرس

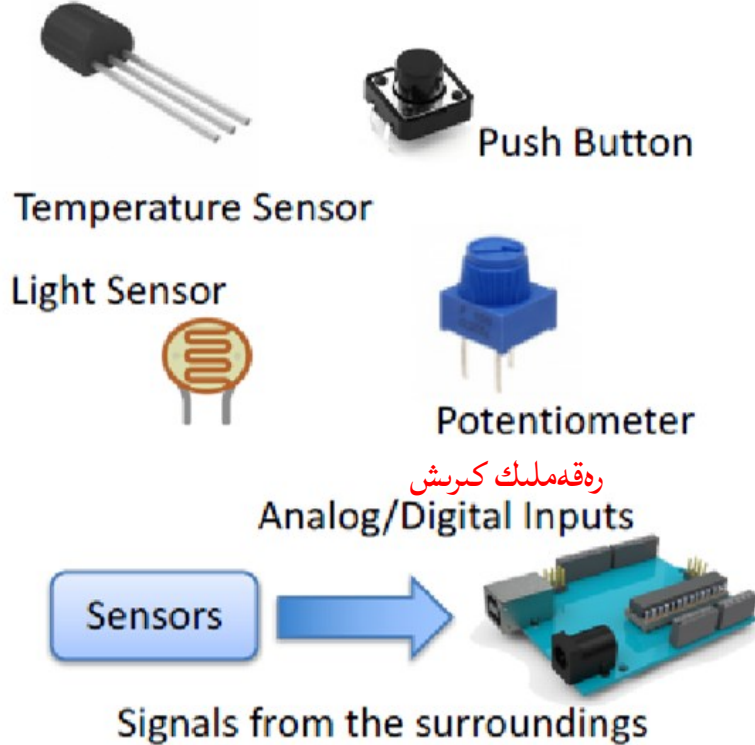
دوكتور مەمەتجان ياسىن

10-02-2024



# سەزگۈچ ۋە قوزغاتقۇچ (Sensors & Activators)

<http://www.mengutech.com/table/>



Arduino تاختىلىرى كىرگۈزگۈچلەرنى ئوقۇيالايدۇ. ئۇ ماتورنى قوزغىتىدۇ

# (Digital Input) رقم مملک کرش

`digitalWrite(Pin, LOW);`  
`digitalWrite(Pin, HIGH);`

`analogWrite(3, 150);`

Digital Inputs and Digital Output

You can choose from the code if they are to be inputs or outputs

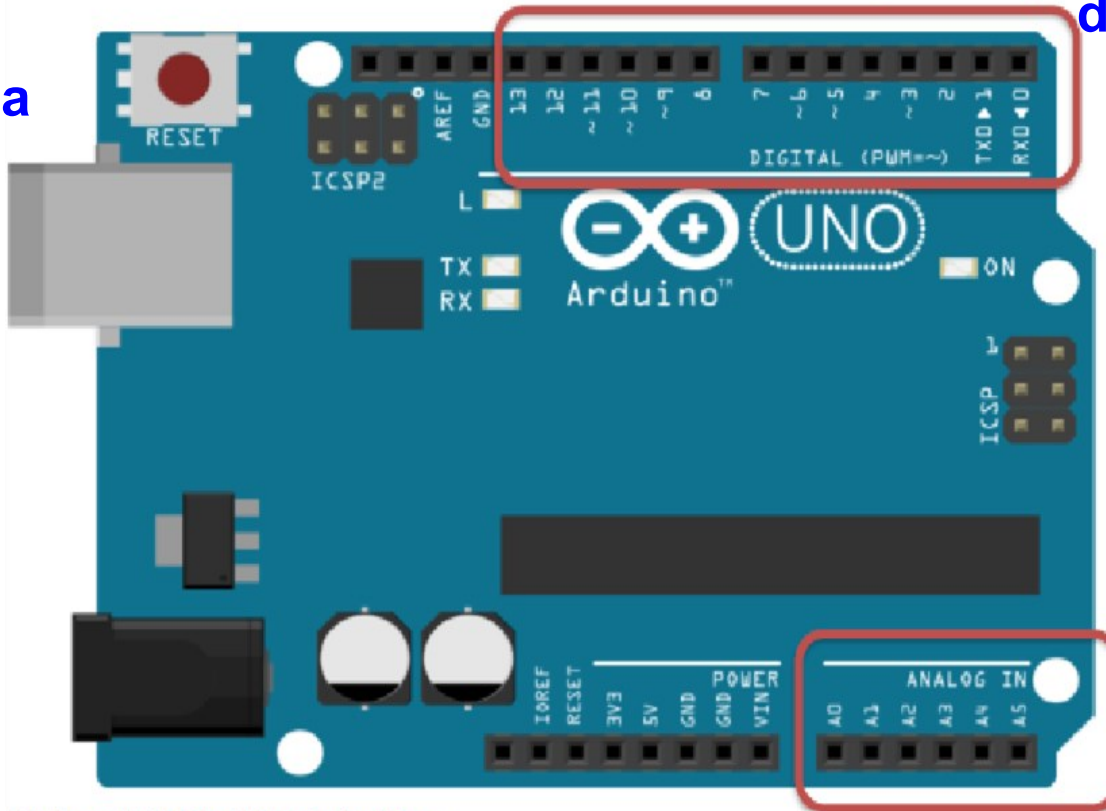
Those marked with ~ can also be used as "Analog Outputs", so-called PWM outputs

Analog Inputs

`Value = analogRead(Pin);`

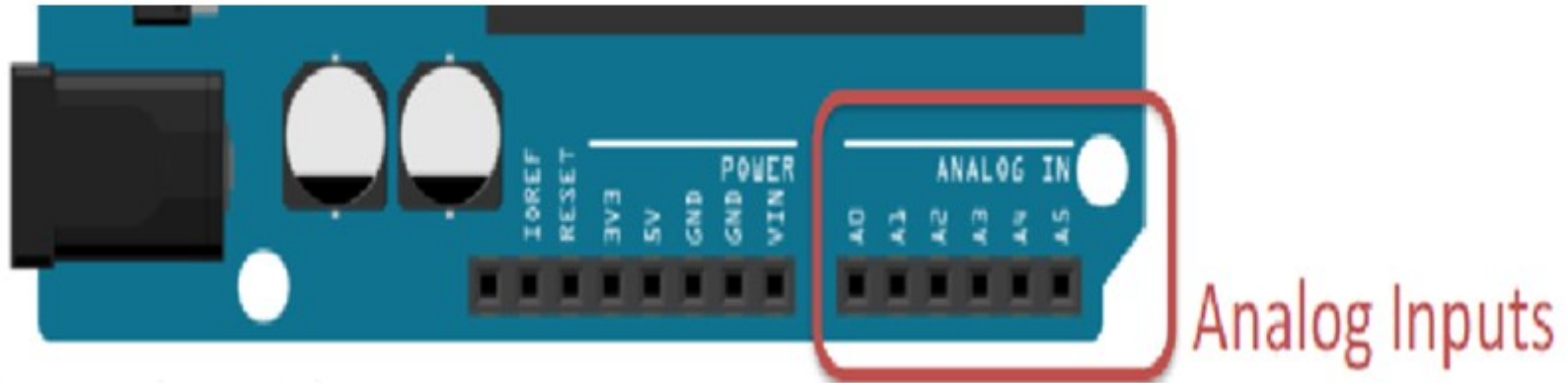
~3, 5, 6,  
9, 10, 11

~ Mega  
1-13



Pulse Width Modulation

# Analog Input

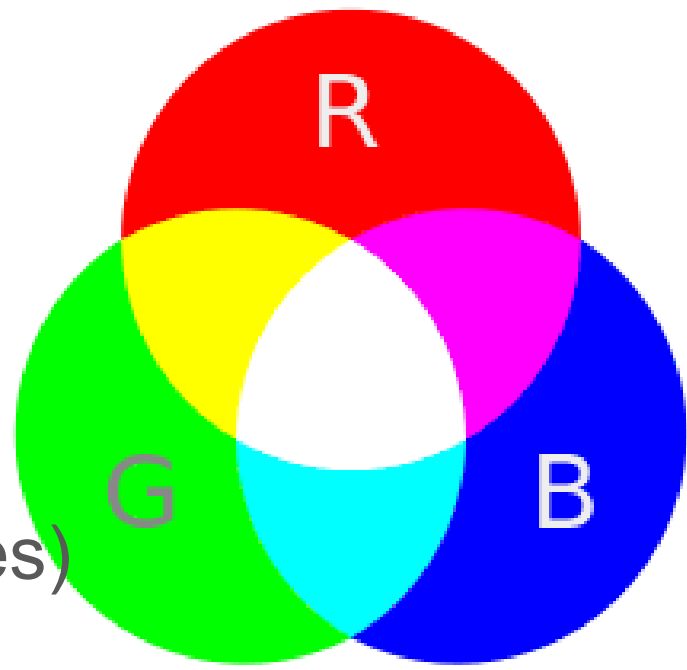


## analogWrite() vs digitalWrite()

- **digitalWrite** gives only output voltage of 0V OR 5V (on and off)
  - 0V is LOW, 5V is HIGH
- **analogWrite** can give output voltage from 0V - 5V
  - range: 0- 255

# What is **RGB**

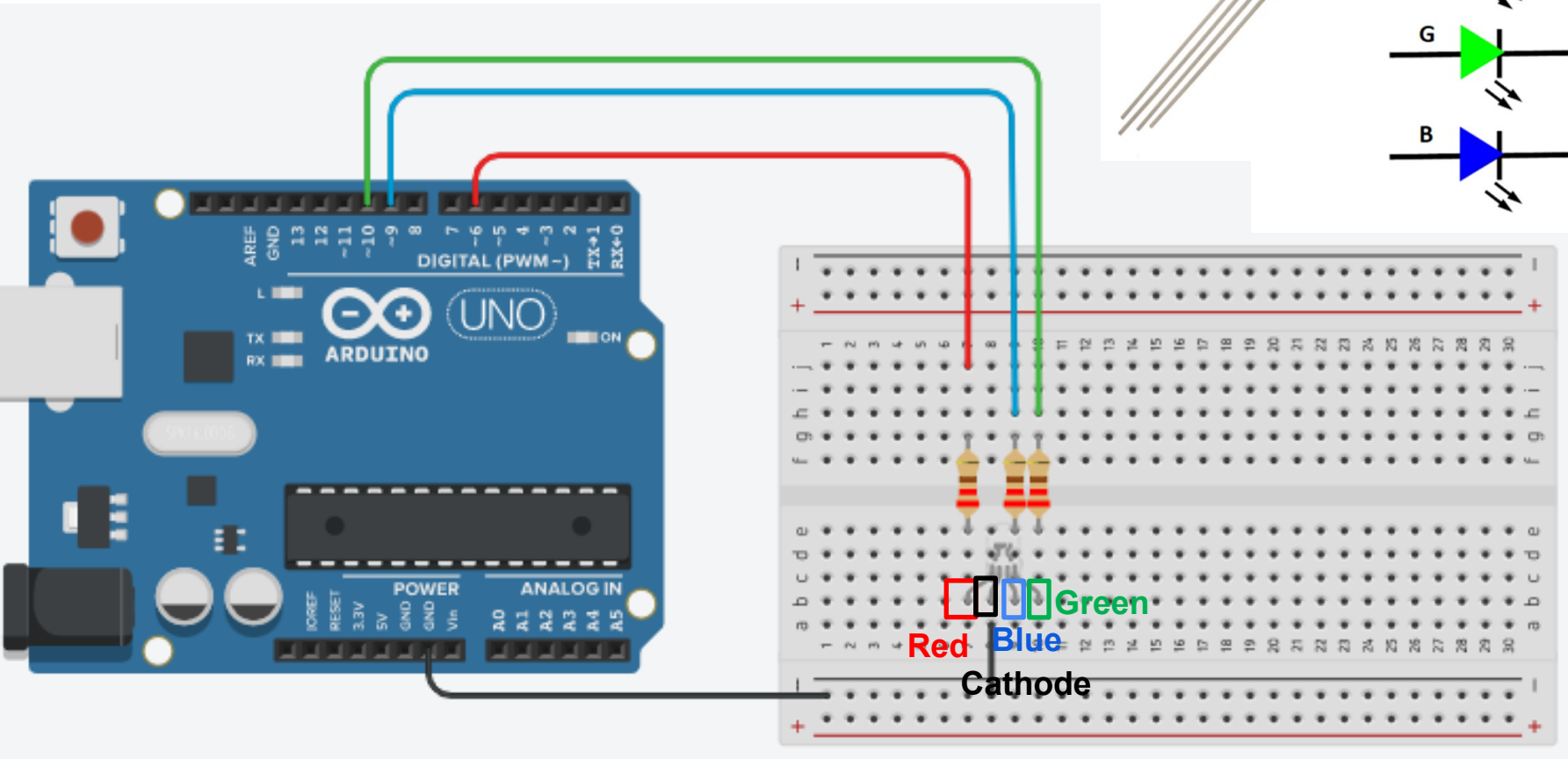
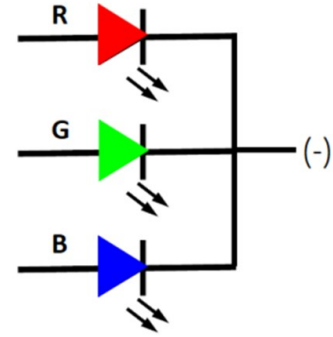
- Colors: **Red**, **Green**, **Blue**
- Mix to create white
- Viewed on screens (digital images)
- Smaller file sizes



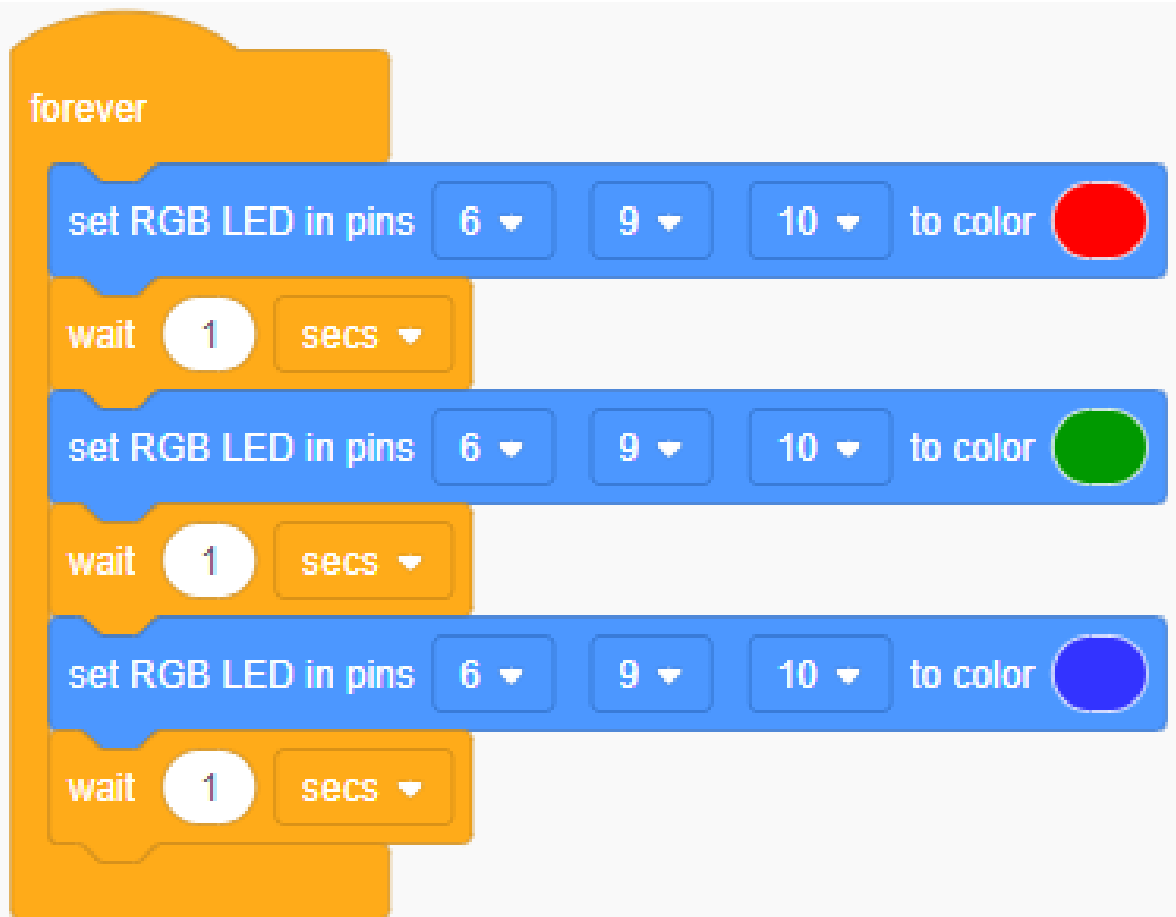
- 1x **R**ed LED
- 1x **G**reen LED
- 1x **B**lue LED

# RGB LED

Common Cathode (-)



# RGB LED





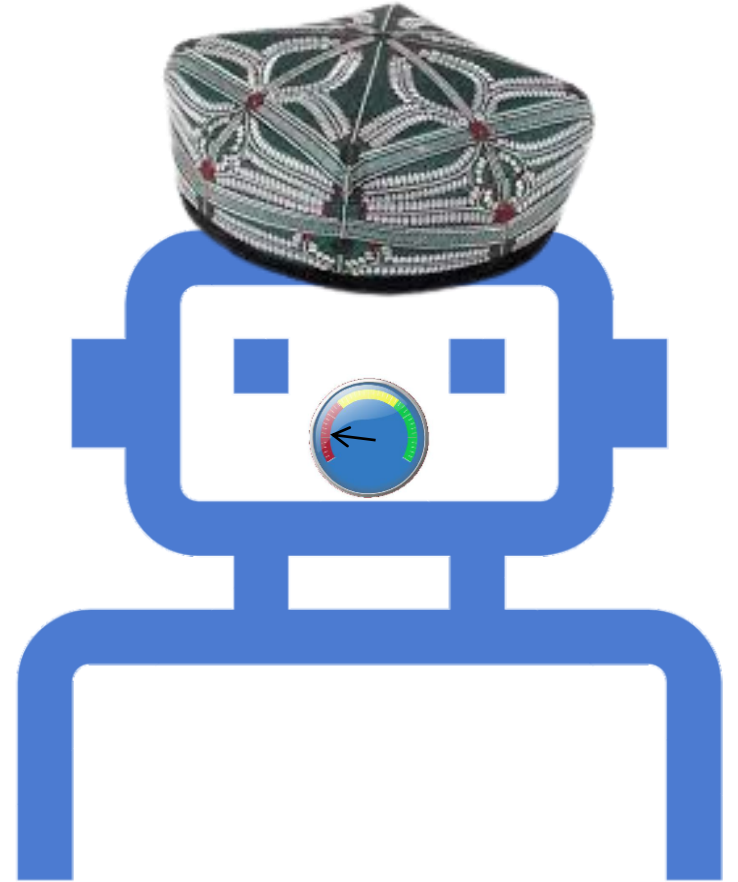
```
// C++ code
//
void setup()
{
  pinMode(6, OUTPUT);
  pinMode(9, OUTPUT);
  pinMode(10, OUTPUT);
}

void loop()
{
  analogWrite(6, 255);
  analogWrite(9, 0);
  analogWrite(10, 0);
  delay(1000); // Wait for 1000 millisecond(s)
  analogWrite(6, 255);
  analogWrite(9, 204);
  analogWrite(10, 0);
  delay(1000); // Wait for 1000 millisecond(s)
  analogWrite(6, 0);
  analogWrite(9, 0);
  analogWrite(10, 153);
  delay(1000); // Wait for 1000 millisecond(s)
}
```

# Tips for debugging

- Check wiring
- Check Pin numbers
- Check Power supply
- Check Resister values
- Check LED direction

# تۈگىدى





# Tinkercad - Arduino نى تونۇشتۇرۇش

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مەڭگۈتەك تور بىتى (ئۇيغۇرچە) <http://www.mengutech.com/tinkercad/>

**English** <https://wiki.nus.edu.sg/display/Arduino/Tinkercad>

We can download/paste the prepared code (Arduino IDE) into the Arduino development environment and test it on a real Arduino board.

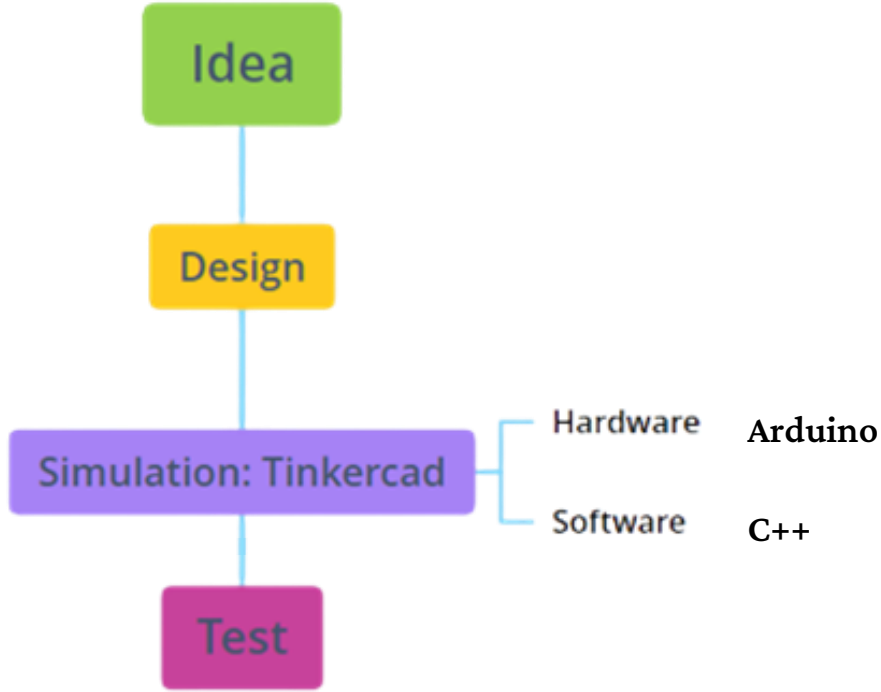
- تەييارلىغان كودنى (Arduino IDE) ئاردۇينو ئىجادىيەت مۇھىتى غا چۈشۈرۈپ /

چاپلاپ ، ھەقىقىي ئاردۇينو تاختىسىدا سىنىياللايمىز .

# دەرس قۇرۇلمىسى structure

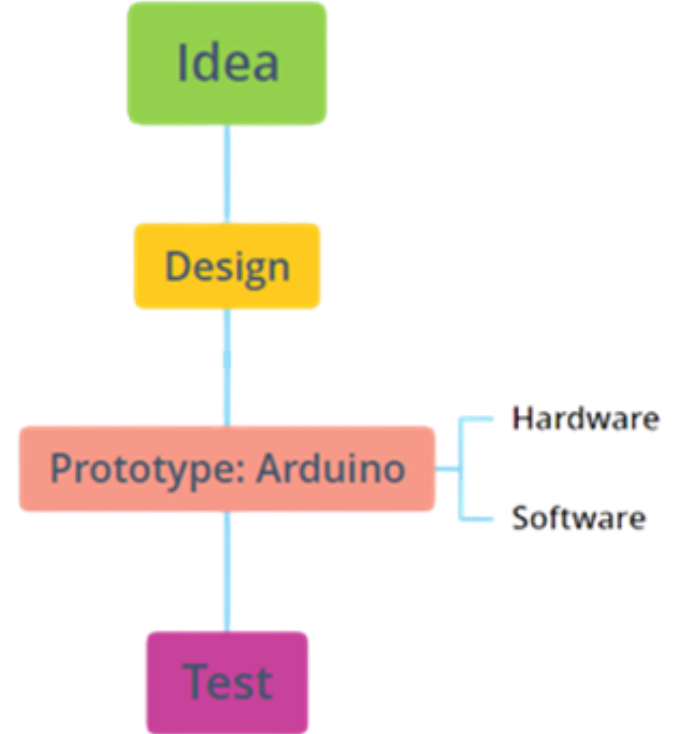
## Simulation

تەقلىد قىلىش



## hardware implementation

قاتتىق دېتالدا يۈرگۈزۈش





```
sketch_feb19a
void setup()
  // put your
}

void loop() {
  // put your
}
}
```

Auto Format Ctrl+T

Archive Sketch

Fix Encoding & Reload

Manage Libraries... Ctrl+Shift+I

Serial Monitor Ctrl+Shift+M

Serial Plotter Ctrl+Shift+L

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WiFi101 / WiFiNINA Firmware Updater

Board: "Arduino Mega or Mega 2560" >

Processor: "ATmega2560 (Mega 2560)" >

Port: "COM3 (Arduino Mega or Mega 2560)" >

Get Board Info

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Programmer: "AVRISP mkII" >

Burn Bootloader

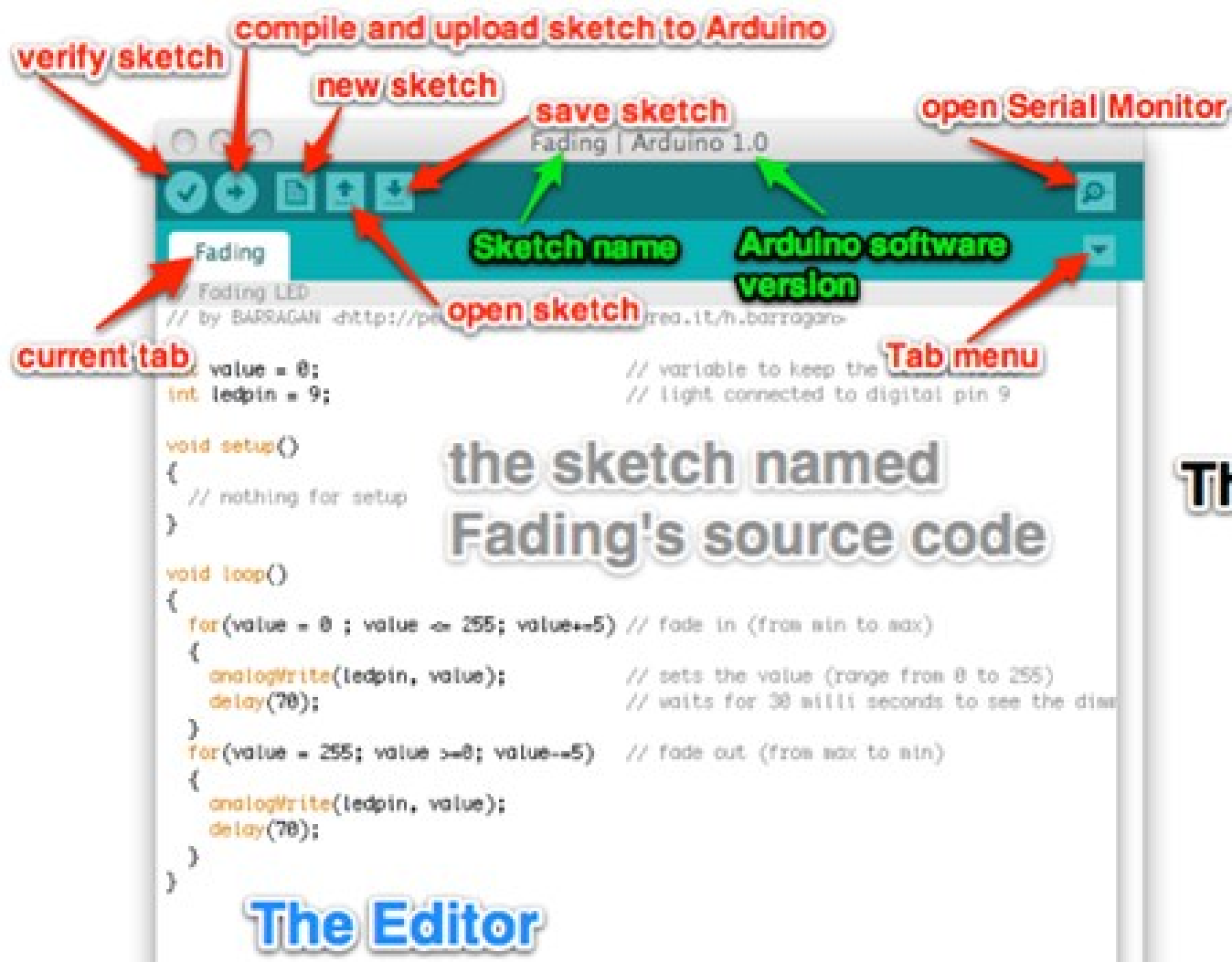
check

تەكشۈرۈڭ

1. Board

2. Port





## The Arduino IDE



ئارقىمۇمۇ ئارقا ئۇلانغان  
ئىشەنچى نازارەت قىلىش  
كۈنۈپكىسى

نۆۋەتتە يىزىلۋاتقان پروگرامما  
كود ھۆججەتسىنى ساقلاش

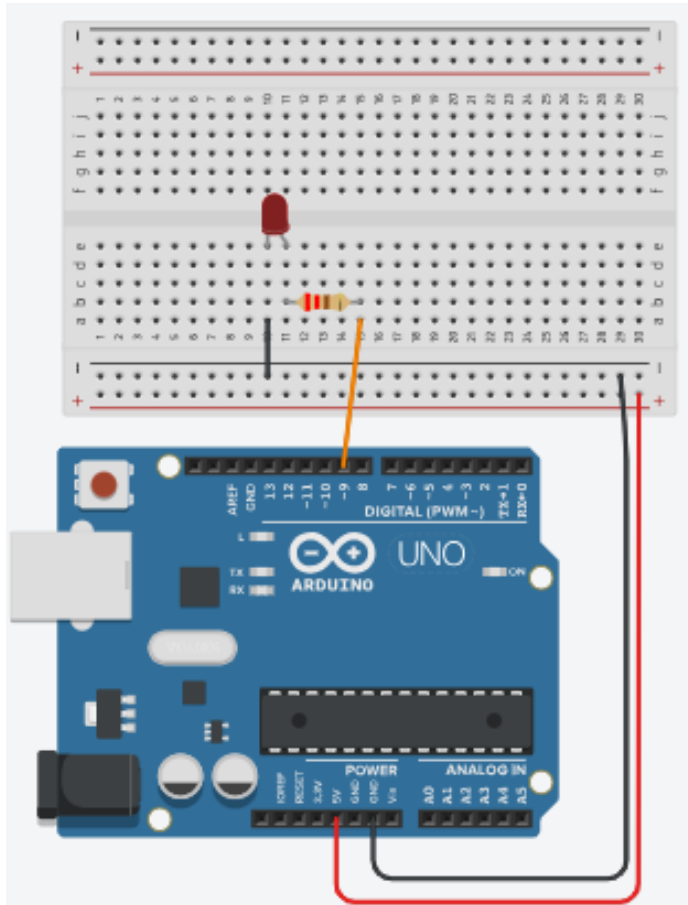
ئىلگىرى بار بولغان پروگرامما كودنى ئىچىش

يىڭى ھۆججەت قۇرۇش كۈنۈپكىسى

پروگراممىنى ئاردۇينوغا يوللاش كۈنۈپكىسى

پروگراممىنى تەكشۈرۈش كۈنۈپكىسى

# fading lamp - يورۇق / سۇس چىراغ



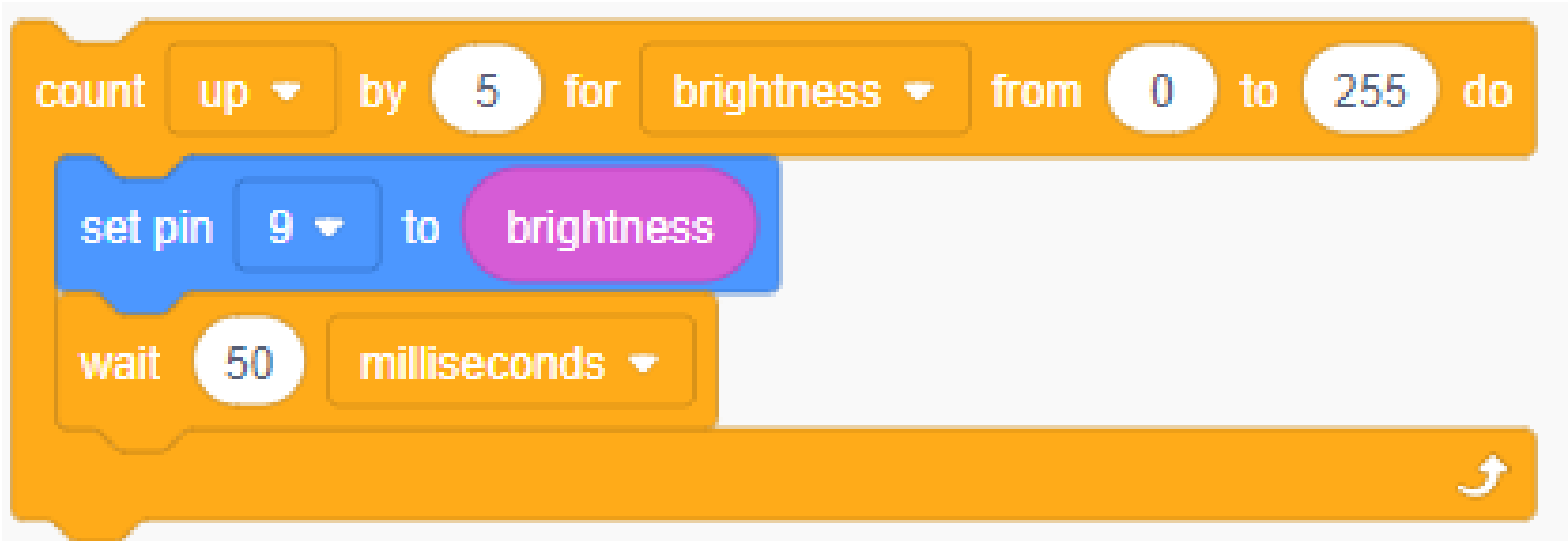
```
int brightness = 0;
int i = 0;

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

void loop()
{
  for (brightness = 0; brightness <= 255; brightness += 5) {
    analogWrite(9, brightness);
    delay(50); // Wait for 50 millisecond(s)
  }
}
```

# fading lamp - يورۇق / سۇس چىراغ

```
count up by 5 for brightness from 0 to 255 do  
  set pin 9 to brightness  
  wait 50 milliseconds
```

The image shows a Scratch code block for a fading lamp. The code is written in a blocky, visual style. The first block is an orange 'do' block with a dropdown menu set to 'brightness', a 'from' field set to '0', and a 'to' field set to '255'. Inside this block, there are three sub-blocks: a blue 'set pin' block with a dropdown set to '9' and a value field set to 'brightness'; an orange 'wait' block with a value field set to '50' and a dropdown set to 'milliseconds'; and a small white arrow icon at the bottom right of the orange block.

# دەرس ماتىرىيالى ۋە ئۇلانمىلار

- تىنكىركاد سىنىپى (<https://www.tinkercad.com/joinclass/TAL58TR2C>)

- مەڭگۈتەك تور بىتى (<http://www.mengutech.com/>)

- [www.mengutech.com/mengutech\\_second](http://www.mengutech.com/mengutech_second)

- YouTube قانىلى (<https://www.youtube.com/channel/UCBbQ81-Lfs2xxYLR4eo5zaw>)

- ئېنگىلىزچە تور بىتى

<https://wiki.nus.edu.sg/display/Arduino/Arduino>

<https://docs.arduino.cc/learn/electronics/lcd-displays>

# تۈگىدى

