

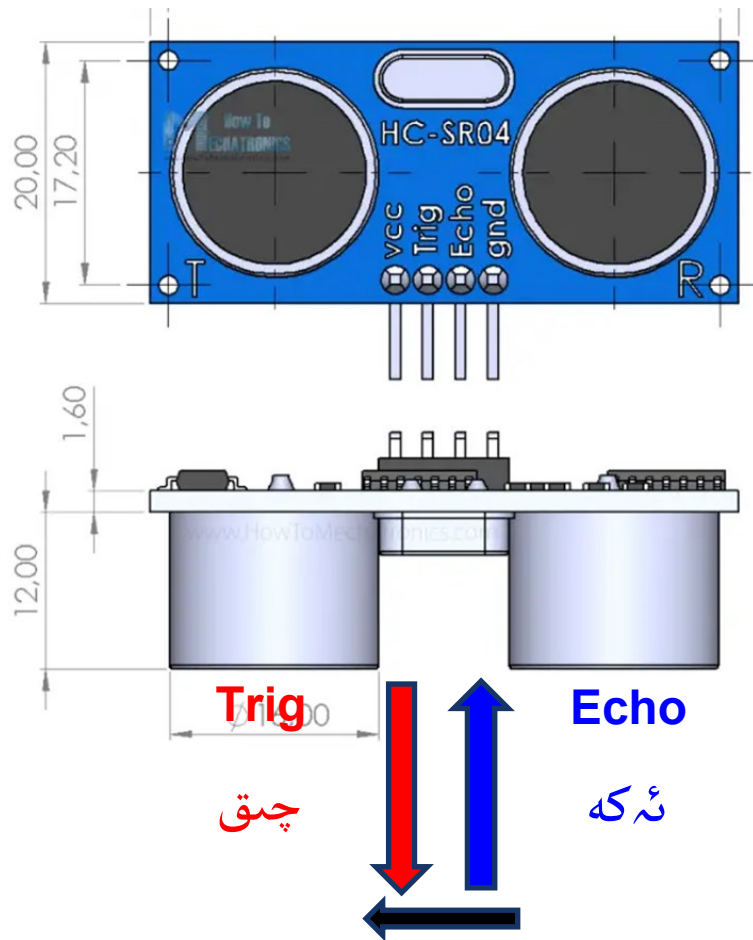


مەڭگۈتەك ئىككىنچى سىنىپ

تۆتىنچى دەرس

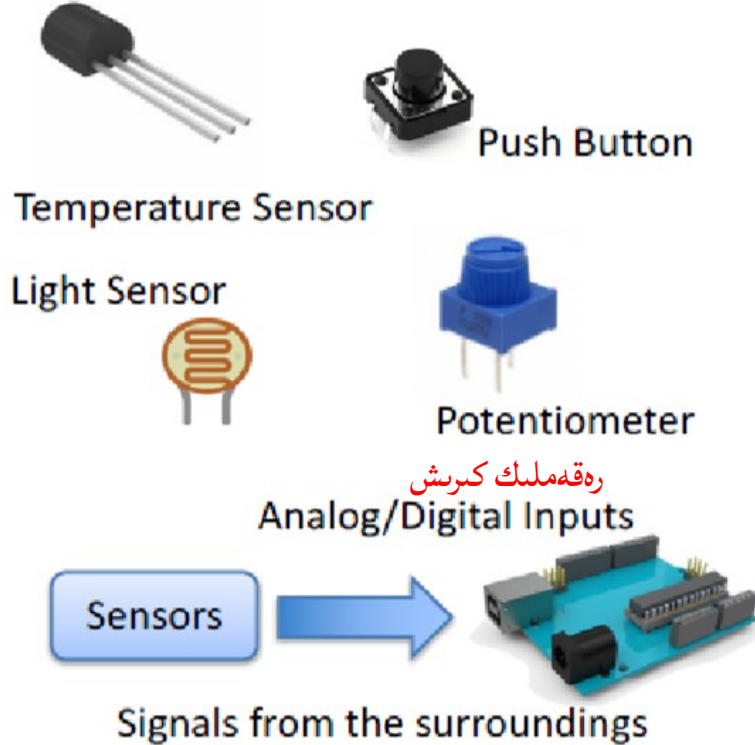
دوكتور مەمەتجان ياسىن

3-02-2024



سەزگۈچ ۋە قوزغاتقۇچ (Sensors & Actuators)

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

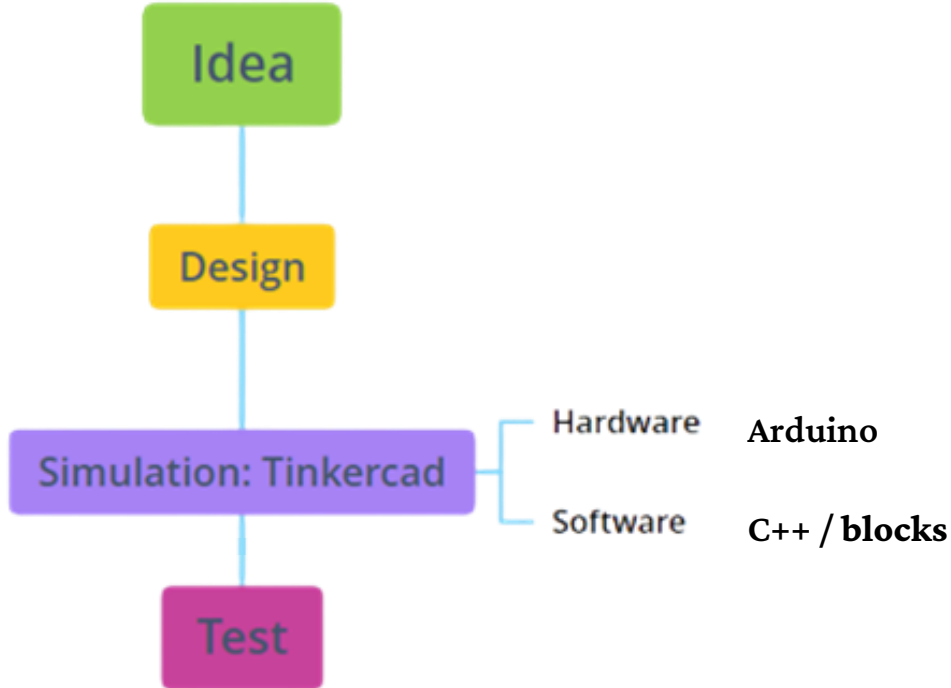


Arduino تاختىلىرى كىرگۈزگۈچلەرنى ئوقۇيالايدۇ. ئۇ ماتورنى قوزغىتىدۇ

دەرس قۇرۇلمىسى structure

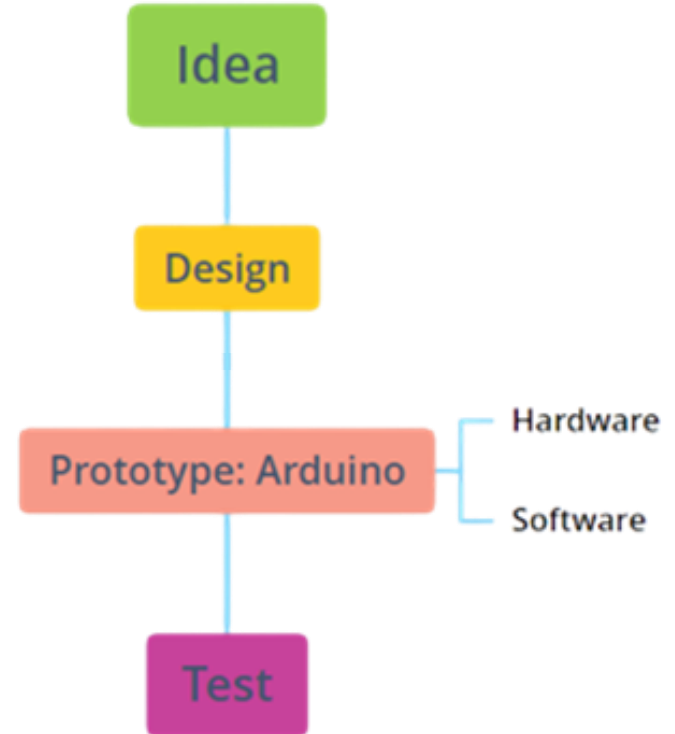
Simulation

تەقلىد قىلىش



hardware implementation

قاتتىق دېتالدا يۈرگۈزۈش

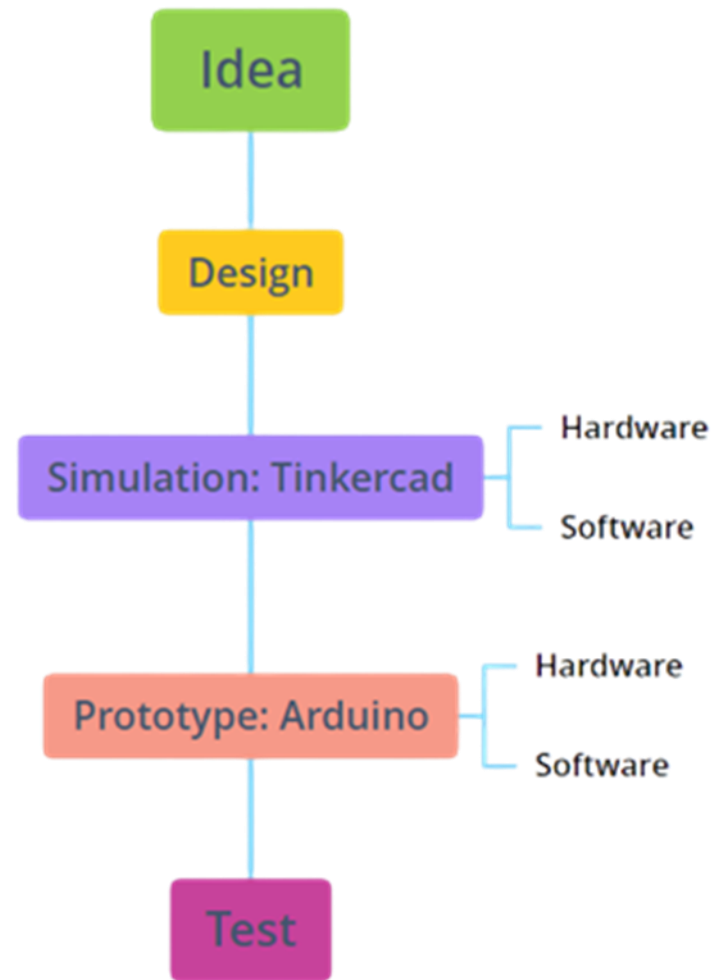


Integration

بىرلەشتۈرۈش

Idea to prototype

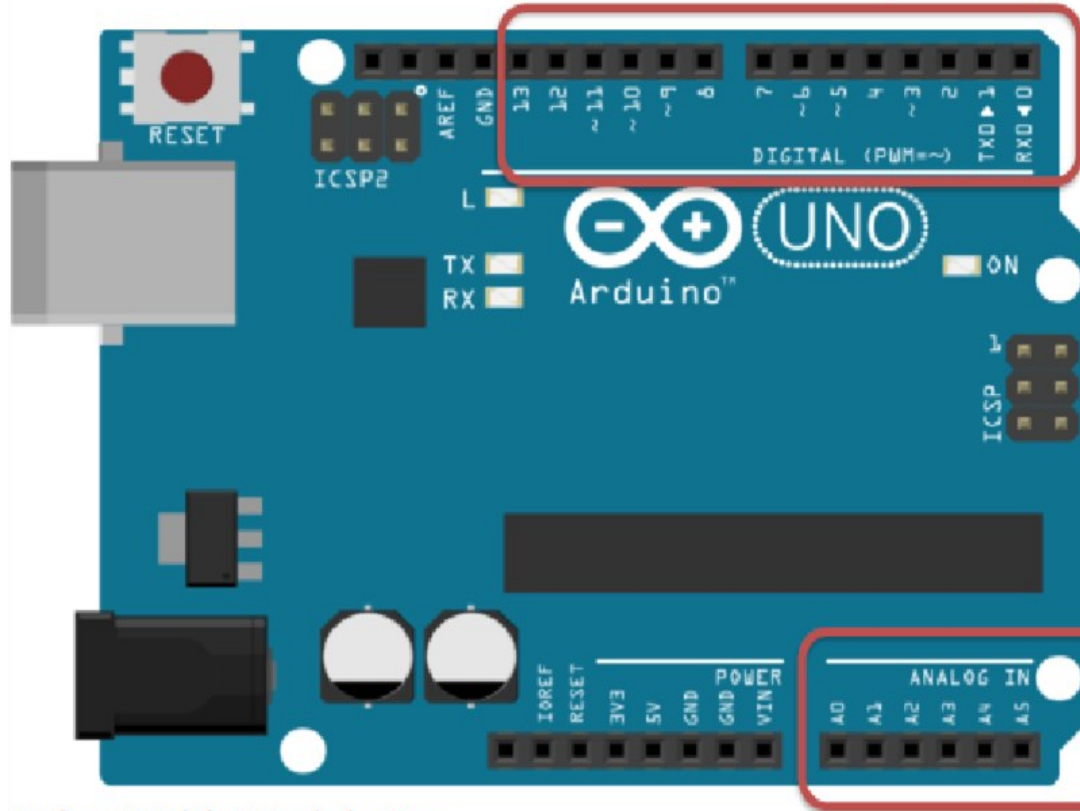
ئىدىيەدىن پروتوتىپقىچە



رہقہ ملک کورش (Digital Input)

رہقہ ملک کورش ۋہ چقش

Digital Inputs and Digital Output

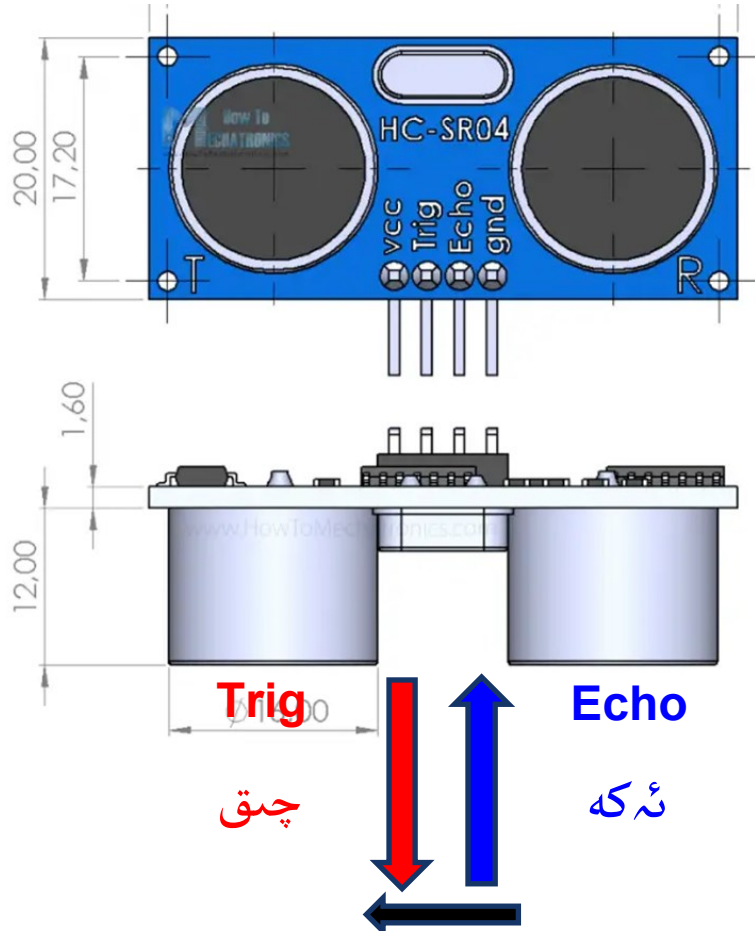


You can choose from the code if they are to be inputs or outputs

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

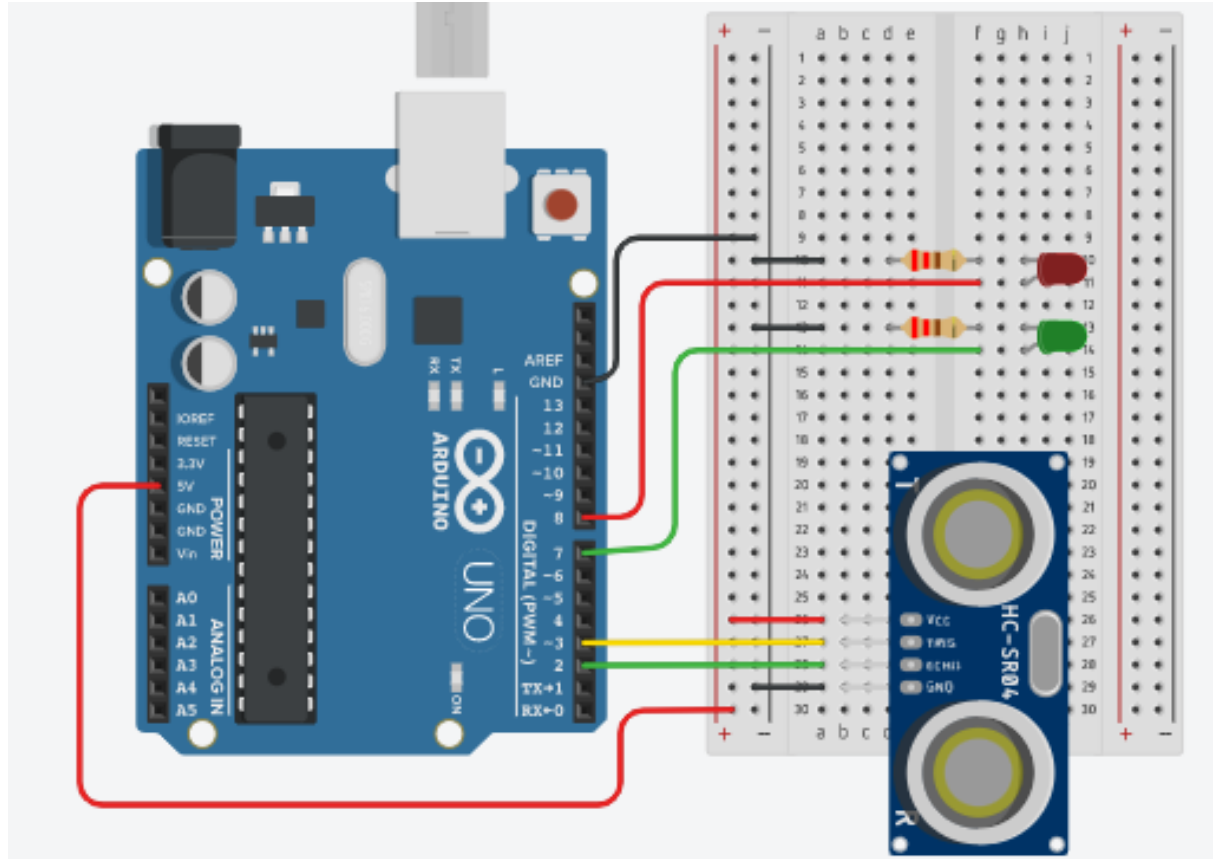
Analog Inputs

Ultrasonic sensor - how does it work?

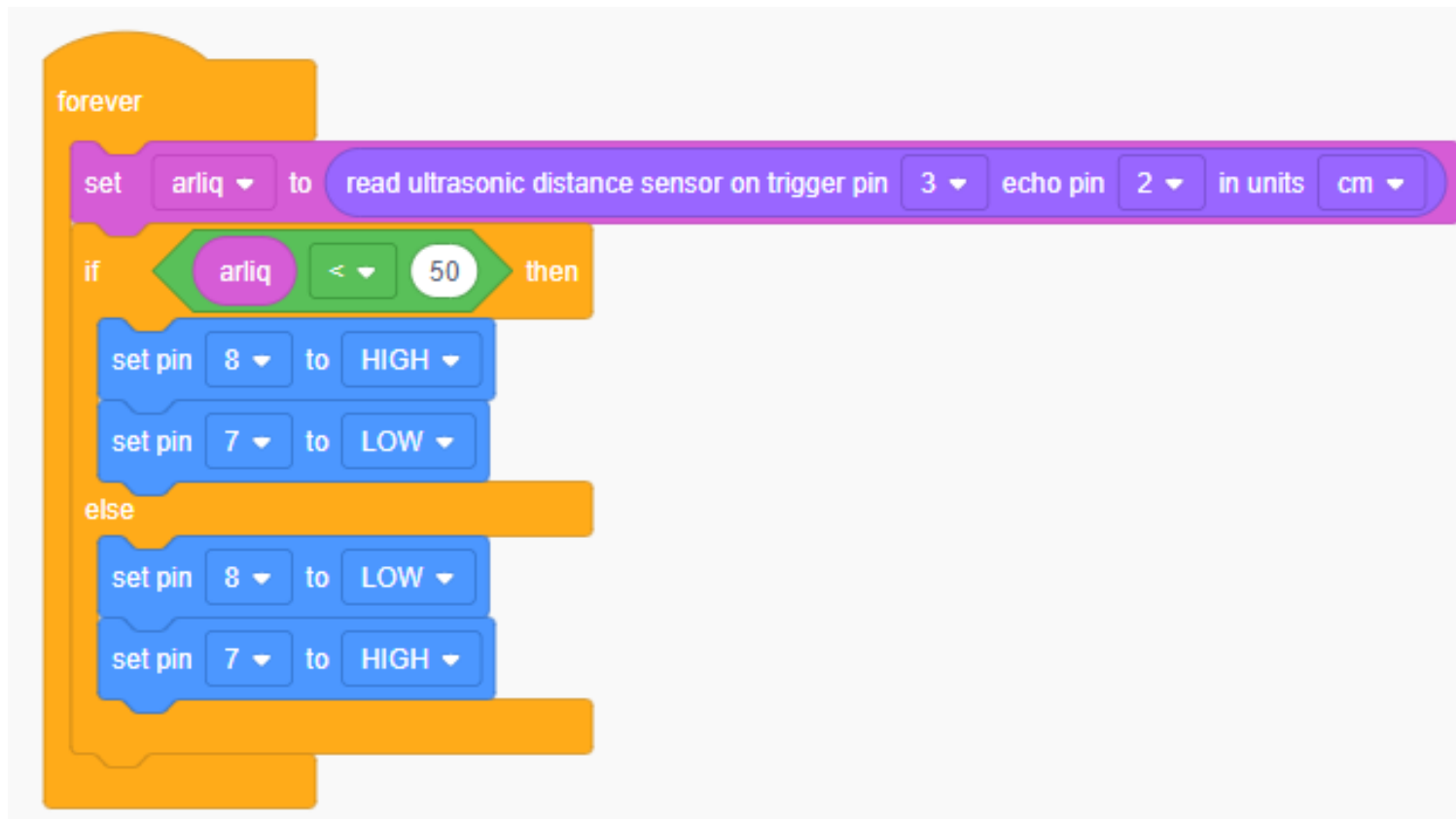


ئۇلترا ئاۋازلىق سەزگۈچ

2- ئەقلىلق ماشىنا توختىتىش ياردەمچى مىسالى



ئەقىللىق ماشىنا توختىتىش ياردەمچى مىسالى-2



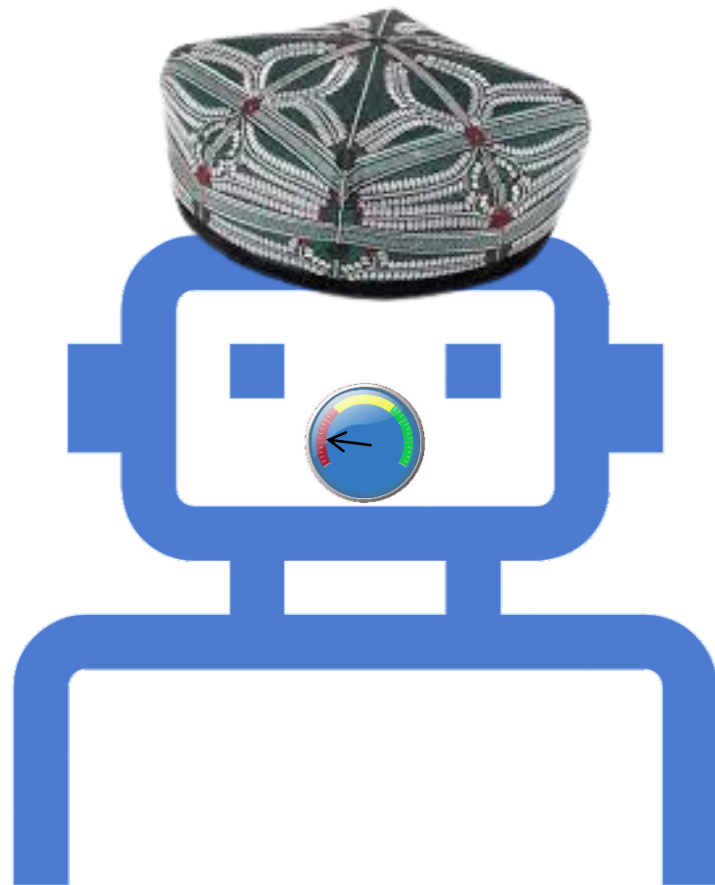
Artificial Intelligence Driving

سۈنئىي ئىدراك

ماشىنا ھەيدەش

Speed	سۈرئەت
Space	ئارلىق
Sign	بەلگە
Stop	توختاش
Slow down	ئاستىلىتىش
Signal	سىگنال بېرىش
Squeeze in, not cut in during lane changes	يول بويلاپ يول ئۆزگەرتىش
Salam	
See	كۆرۈش
Safe driving (defensive driving)	بىخەتەر ماشىنا ھەيدەش
Safety skills	بىخەتەرلىك ماھارەت

تۈگىدى



Tinkercad - Arduino نى تونۇشتۇرۇش

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

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

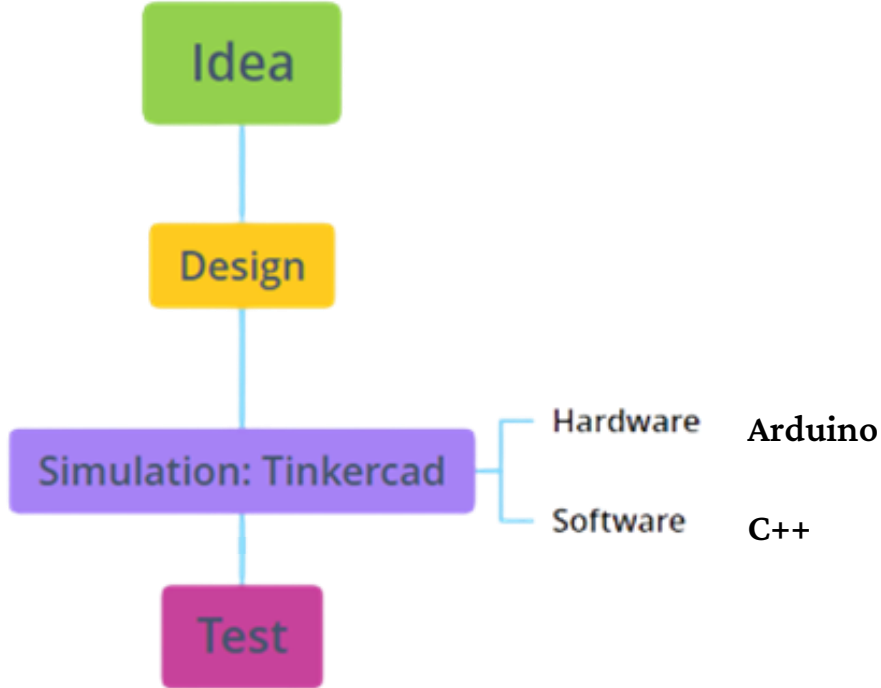
We can download/paste the prepared code (Arduino IDE) into the Arduino development environment and test it on a real Arduino board.

- تەييارلىغان كودنى (Arduino IDE) ئاردۇينو ئىجادىيەت مۇھىتى غا چۈشۈرۈپ / چاپلاپ ، ھەقىقىي ئاردۇينو تاختىسىدا سىنىيالايمىز .

دەرس قۇرۇلمىسى structure

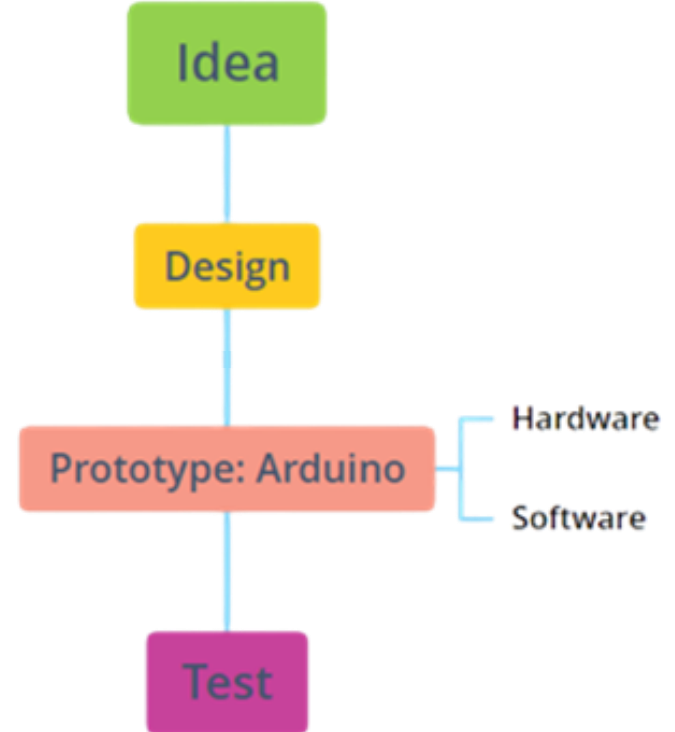
Simulation

تەقلىد قىلىش



hardware implementation

قاتتىق دېتالدا يۈرگۈزۈش



File Edit Sketch Tools Help



sketch_feb19a

```
void setup()
// put your code here

}
```

```
void loop() {
// put your code here

}
```

Auto Format Ctrl+T

Archive Sketch

Fix Encoding & Reload

Manage Libraries... Ctrl+Shift+I

Serial Monitor Ctrl+Shift+M

Serial Plotter Ctrl+Shift+L

WiFi101 / Wi-Fi NINA Firmware Updater

Board: "Arduino Mega or Mega 2560" >

Processor: "ATmega2560 (Mega 2560)" >

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

Get Board Info

Programmer: "AVRISP mkII" >

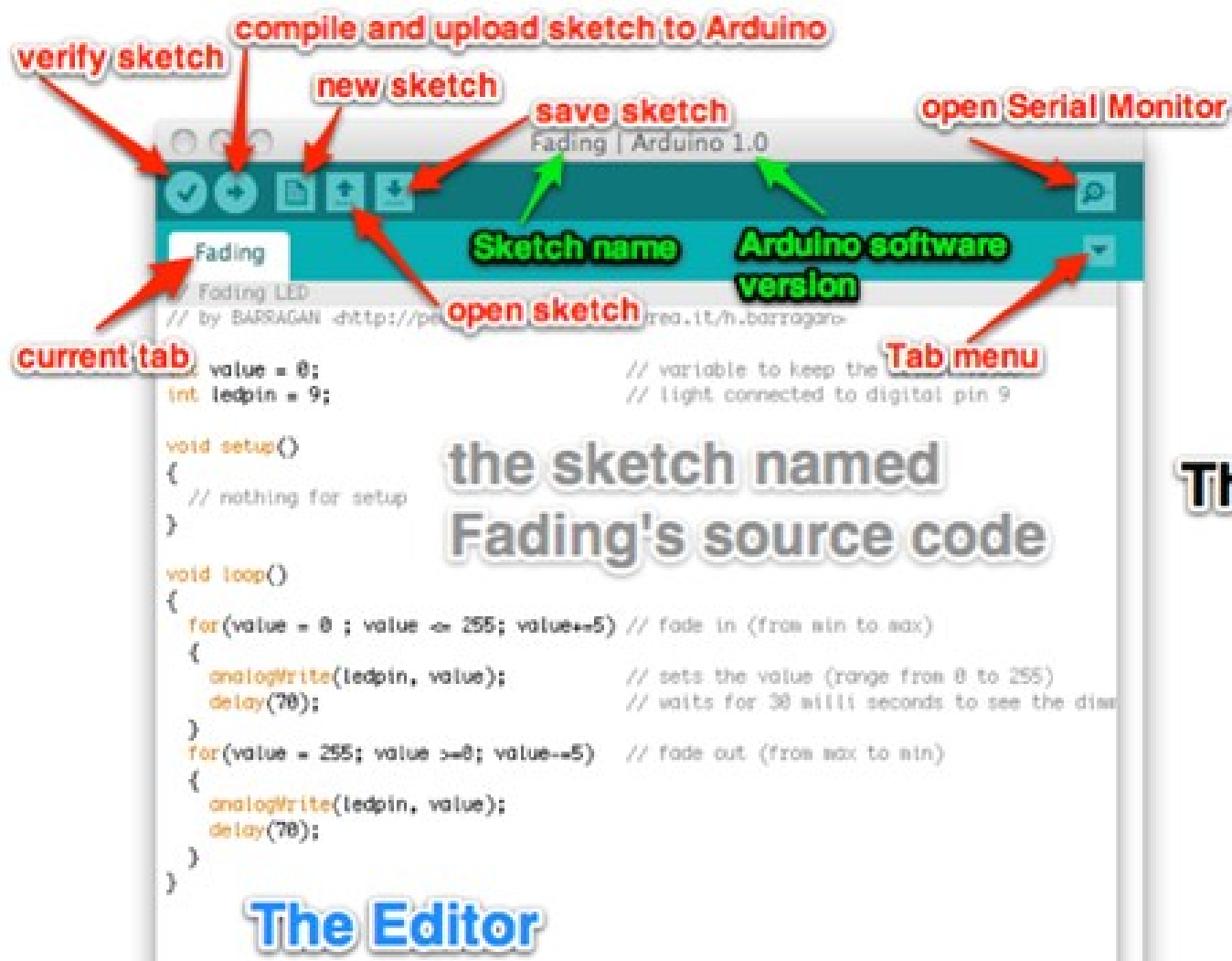
Burn Bootloader

check

تەكشۈرۈڭ

1. Board

2. Port



The Arduino IDE

sketch_may01a

ئارقىمۇمۇ ئارقا ئۇللانغان
ئىدىزنى نازارەت قىلىش
كۈنۈپكىسى

نۆۋەتتە يىزىلۋاتقان پىروگرامما
كود ھۆججىتىنى ساقلاش

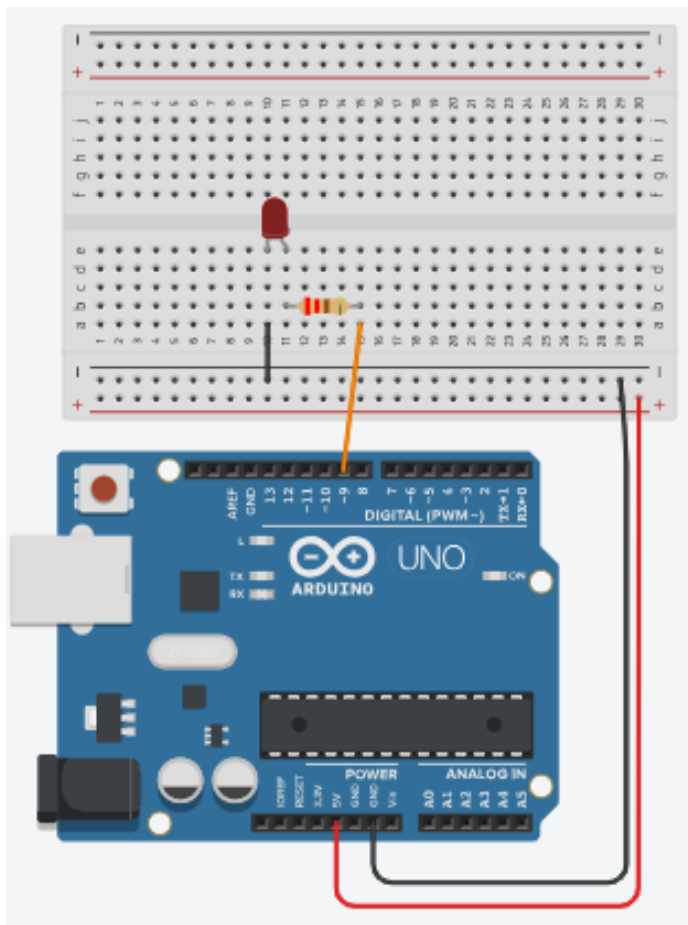
ئىلگىرى بار بولغان پىروگرامما كودنى ئىچىش

يىڭى ھۆججەت قۇرۇش كۈنۈپكىسى

پىروگراممىنى ئاردۇينوغا يوللاش كۈنۈپكىسى

پىروگراممىنى تەكشۈرۈش كۈنۈپكىسى

fading lamp - يورۇق / سۇس چىراغ

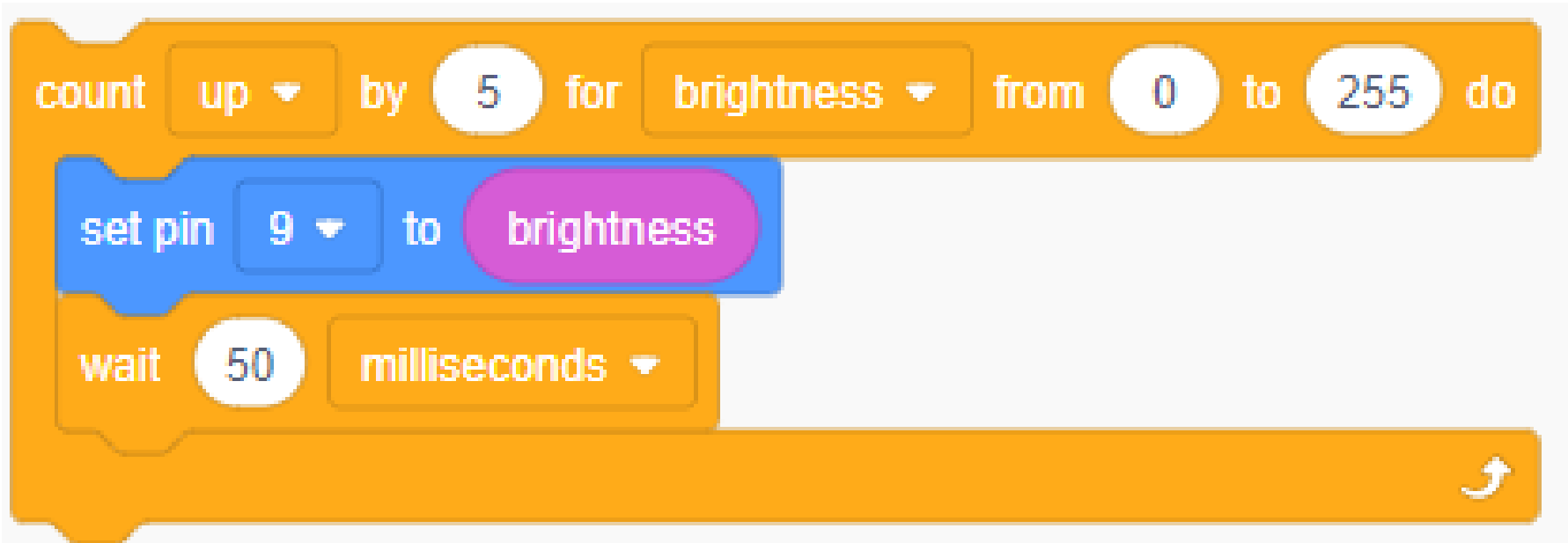


```
int brightness = 0;
int i = 0;

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

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

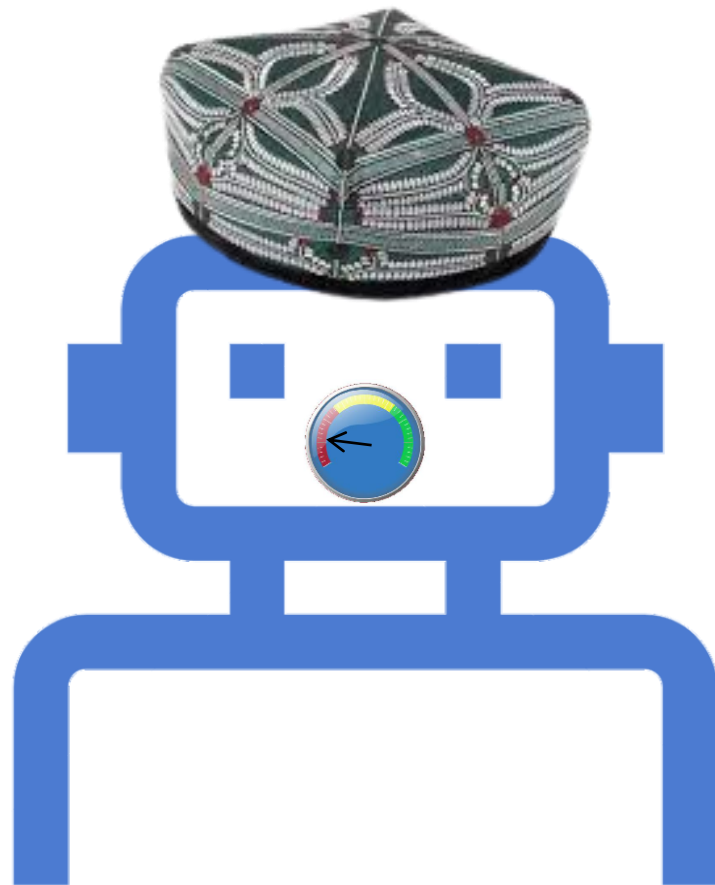
fading lamp - يورۇق / سۇس چىراغ



دەرس ماتىرىيالى ۋە ئۇلانمىلار

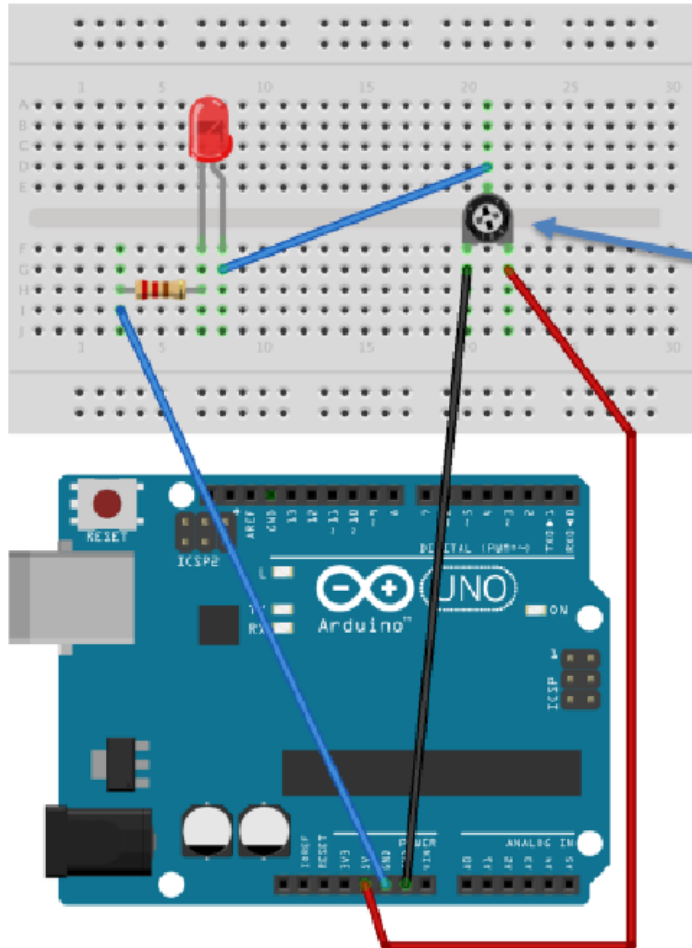
- تىنكىركاد سىنىپى (<https://www.tinkercad.com/joinclass/TAL58TR2C>)
- مەڭگۈتەك تور بىتى (<http://www.mengutech.com/>)
- www.mengutech.com/mengutech_second
- YouTube قانىلى (<https://www.youtube.com/channel/UCBbQ81-Lfs2xxYLR4eo5zaw>)
- ئېنگىلىزچە تور بىتى
<https://wiki.nus.edu.sg/display/Arduino/Arduino>
<https://docs.arduino.cc/learn/electronics/lcd-displays>

تۈگىدى



مسائل

Wiring



TRY IT OUT!

Adjust the the dimmer (potentiometer) in order to increase or decrease the intensity of the light (LED)

Note! No Arduino Program is needed in this example

بىزنىڭ ئۆگىتىش ئۇسۇلىمىز

- To build skills, product, and better future career
- Need to convert our weakness and challenge to opportunity, strength, and power
 - o Mindset – high mind
 - o Skillset
 - o Toolset

- **Mindset:**

- Talk about Visual Leadership and its role in times of crisis
- Current technology - digital world and future of AI
- Mentality is reality □ Movement starts within you

24

- **Toolset:**

- Simulation with Tinkercad / Hardware / Software / Integration / Documentation – idea

- **Skillset:**

- Step by Step (one sensor at a time, and add more sensors one by one)

پروگرامما

Program Structure

```
//Globle variable
...

void setup()
{
  //Initialization
}

void loop()
{
  //Main Program
}
```

You need to use the following:

Which Pin (0, 1, 3, ...) are you using?

pinMode(pin, mode);

A Digital Pin can either be an INPUT or an OUTPUT. Since we shall use it to turn-on a LED, we set it to OUTPUT.

digitalWrite(pin, value);

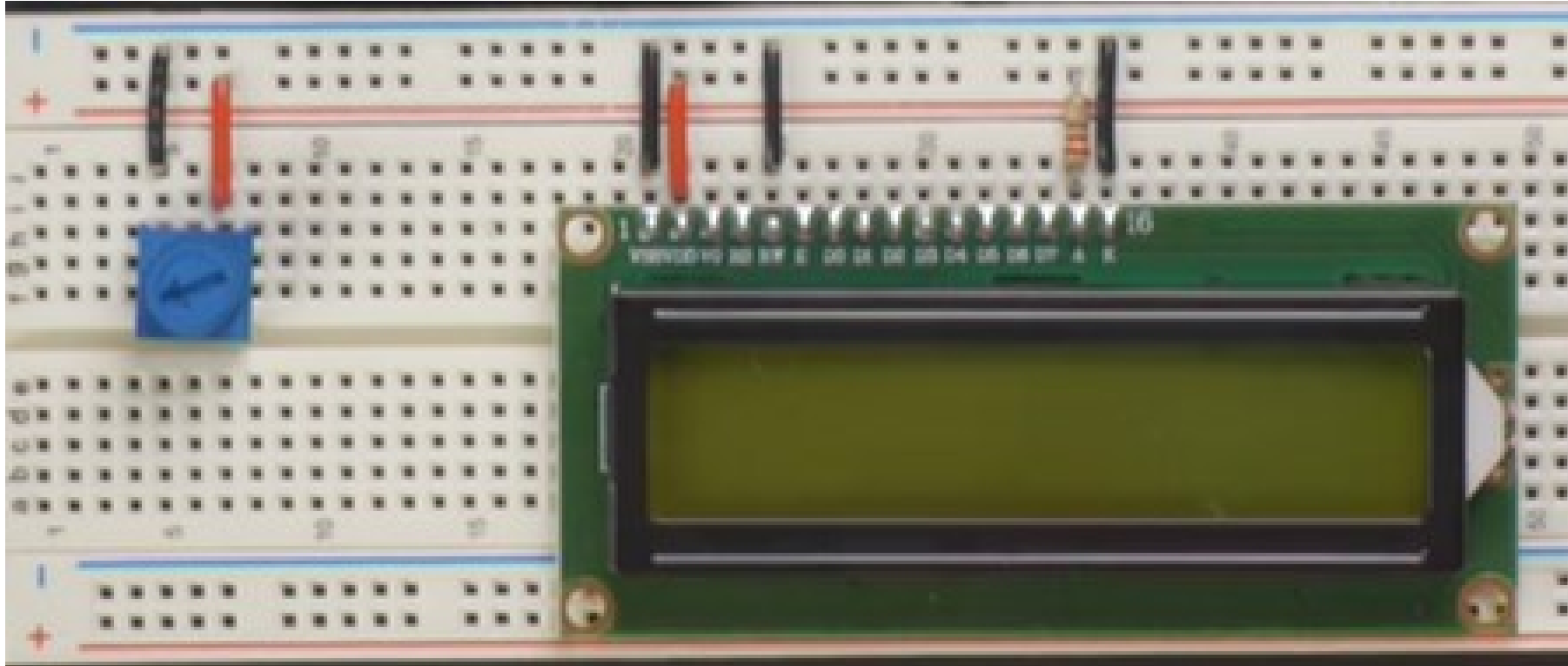
Turn-on LED Turn-off LED

A Digital Pin can have 2 values, either HIGH or LOW

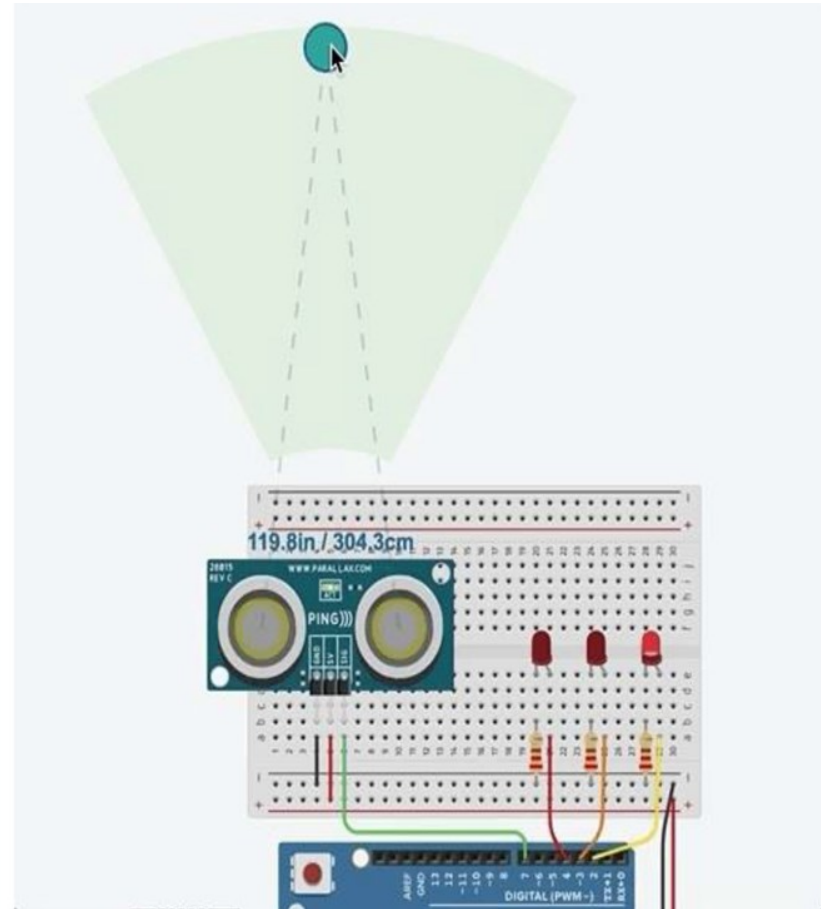
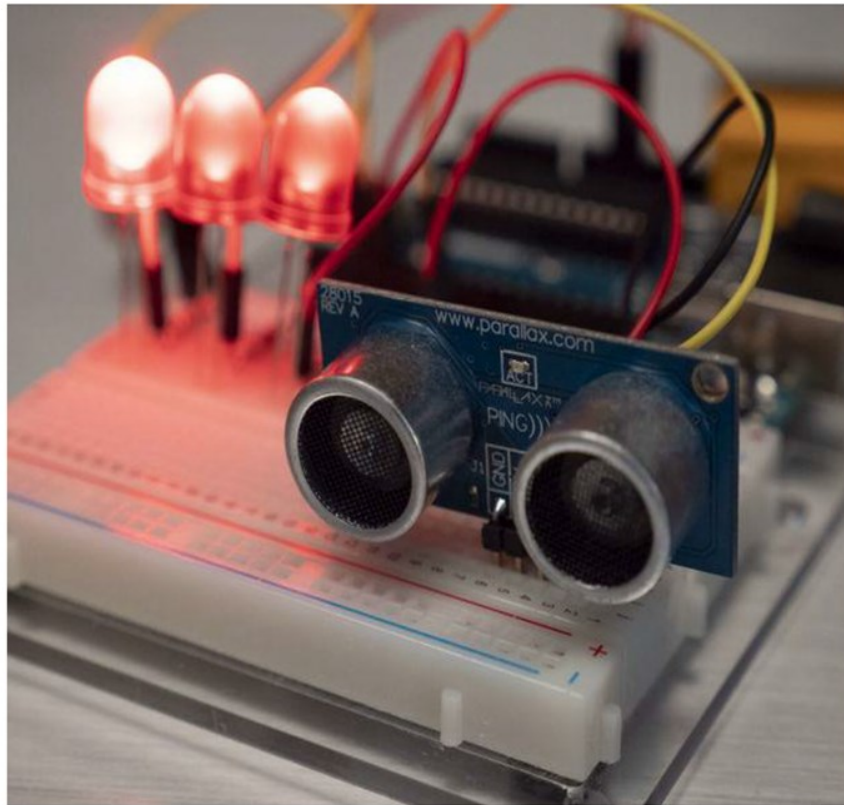
delay(ms);

The delay() function makes a small pause in milliseconds (ms), e.g., delay(1000) pause the program for 1 second

یاخشی پروتوتپ



تہ قلیلق ماشنا توختتش یارده مچسی



قاتناش سۈرئىتىنى ئۆلچىگۈچ

(1) x Elegoo Mega 2560 R3

(1) x LCD1602 module

(1) x Potentiometer

(1) x Breadboard

(16) x wires

LCD pin	Arduino pin Number
RS	pin 7
EN	pin 8
D4	pin 9
D5	pin 10
D6	pin 11
D7	pin 12
V0	center pin of a pot
VDD & A:	5V
VSS,RW,K:	GND

