

# **Prižiganje lučk z Arduinom**

# Kaj bomo danes počele?

## Spoznale:

- Arduino Nano
- Testno ploščico (Breadboard)
- LED lučke, upornike, žičke, foto senzorje
- Osnove programiranja v C++ (spremenljivke, funkcija, for zanka)

## Koda:

- <https://github.com/22nds>

# Sestavni deli

- 2 x LED
- 1 x RGB LED
- 3 x 220 Ohm upornik
- 1 x 1k Ohm upornik
- 2 x žičke
- 1 x Foto Sensor
- Testna ploščica (Breadboard)

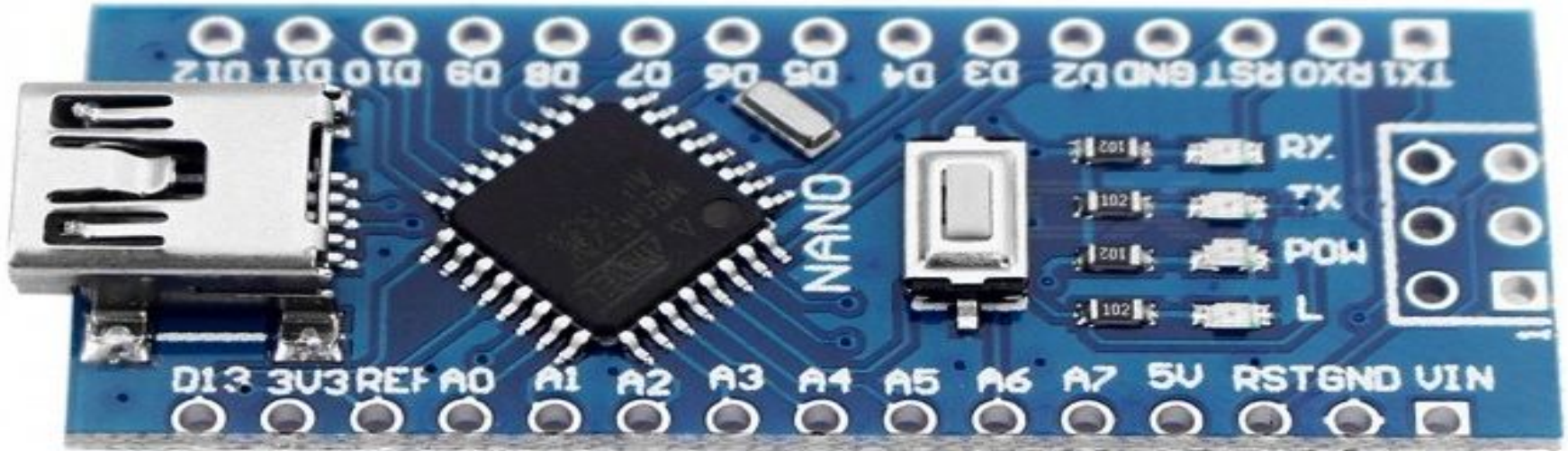
=====

- USB kabel
- Računalnik
- Programska oprema

# Arduino Nano

# Arduino Uno ->

- Uradna stran: <https://store.arduino.cc/arduino-nano>
- Gonilniki: <http://sparks.gogo.co.nz/ch340.html>



# Namestitev programske opreme za Arduino

- Arduino IDE <https://www.arduino.cc/en/Main/Software> ali
- Spletni urejevalnik <https://create.arduino.cc/editor/>
- Urejevalnik za Android: <https://play.google.com/store/apps/details?id=name.antonsmirnov.android.arduinoandroid2>



## ARDUINO 1.8.5

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software.

This software can be used with any Arduino board. Refer to the [Getting Started](#) page for Installation instructions.

**Windows** Installer

**Windows** ZIP file for non admin install

**Windows app** 

**Mac OS X** 10.7 Lion or newer

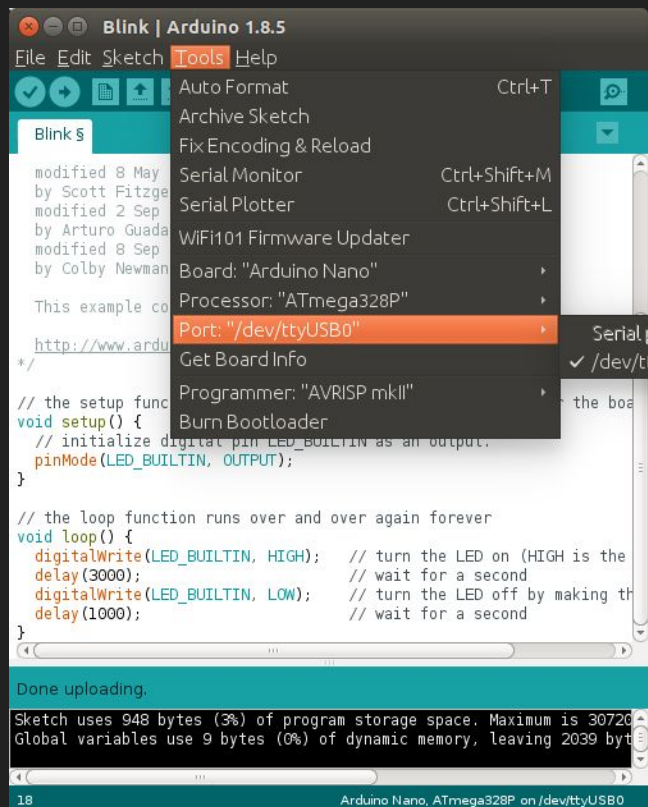
**Linux** 32 bits

**Linux** 64 bits

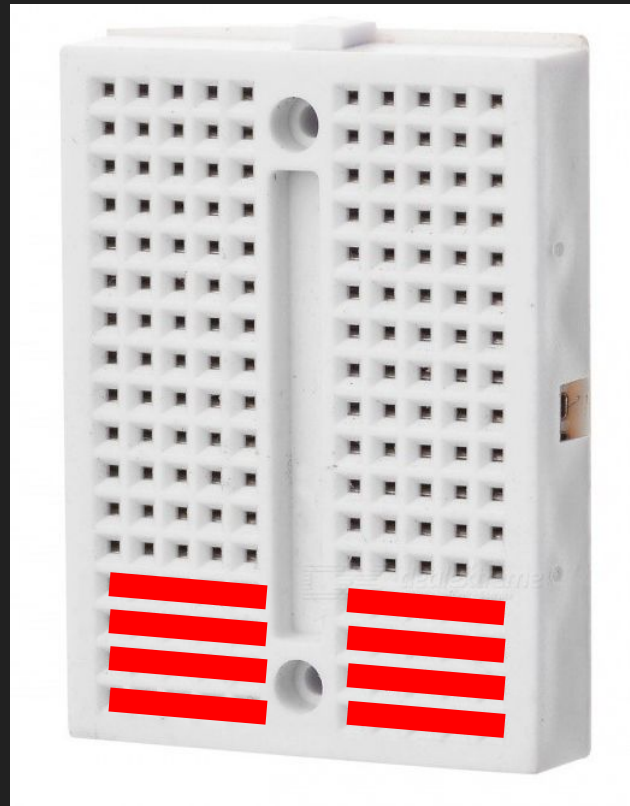
**Linux** ARM

[Release Notes](#)

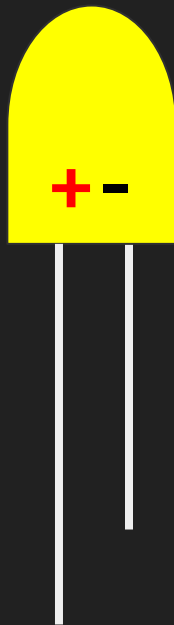
# Nastavitve za Arduino



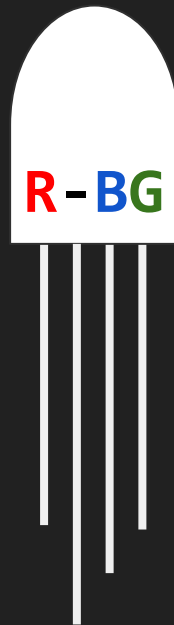
# Testna ploščica



# LED lučky

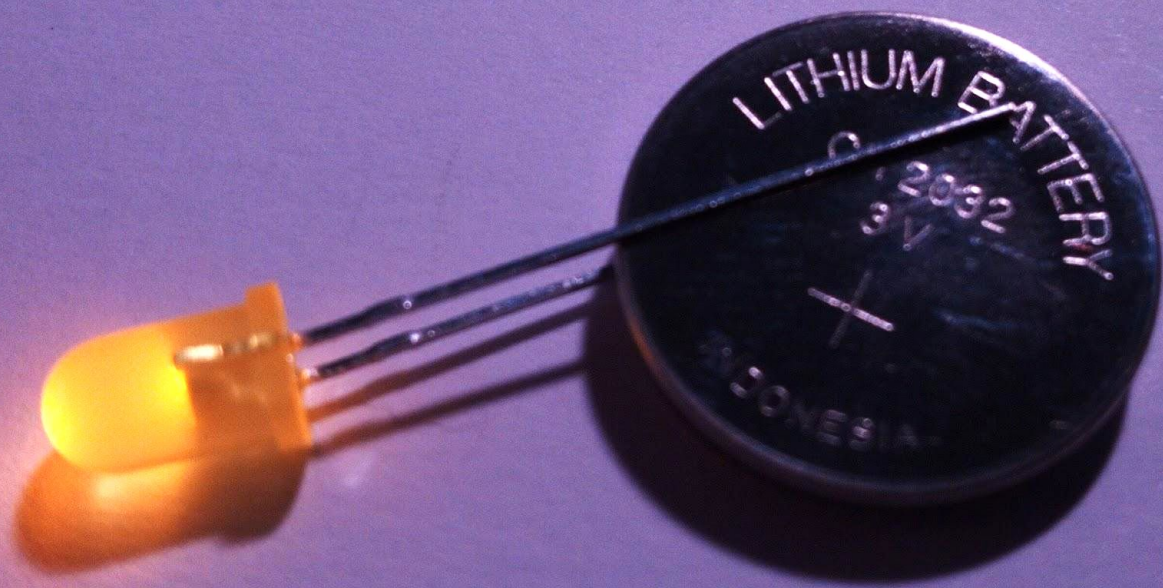


LED



RGB LED





# Uporniki - moč in računanje upora

Upornik se upira električnemu toku in mu preprečuje, da bi nemoteno tekel skozenj.

$$\text{Napetost (V)} = \text{Tok(I)} * \text{Upor(R)}$$

Upor: 220 Ohmov

Napetost: 5 Voltov

=====

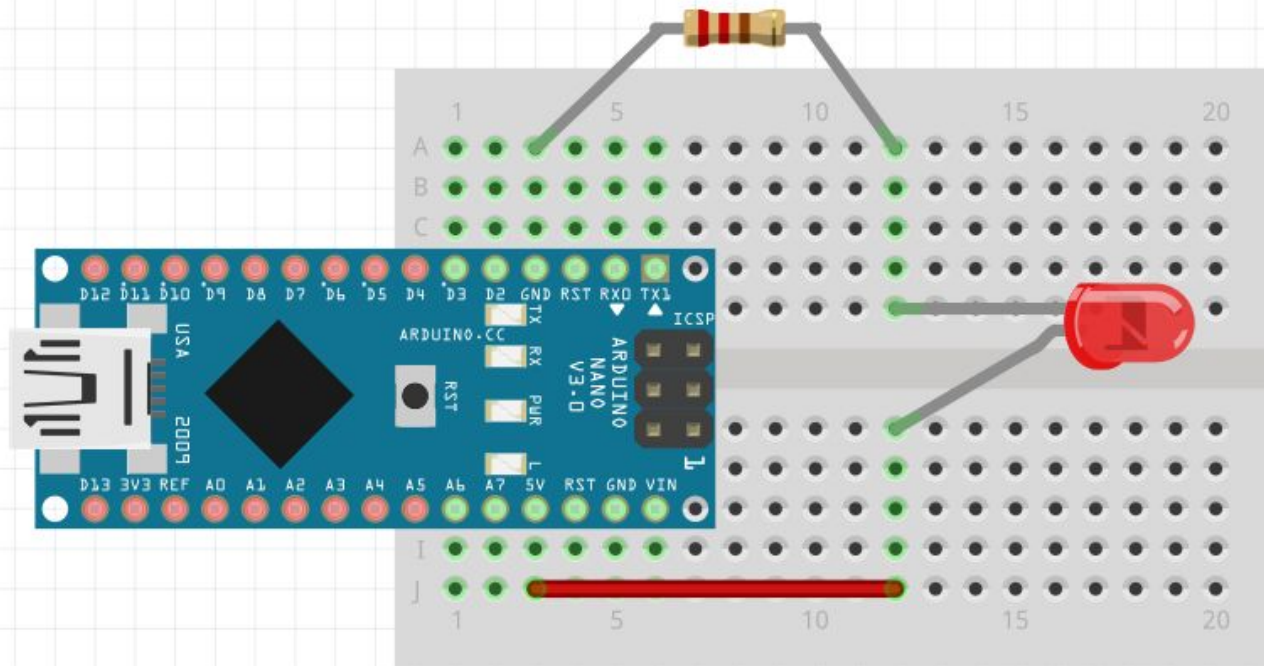
Tok: 23 mA (mili amperov)

$$5V = 23 \text{ mA} * 220 \text{ Oh}$$

$$5V = 0.0227A * 220 \text{ Oh}$$

# Lučka brez programa

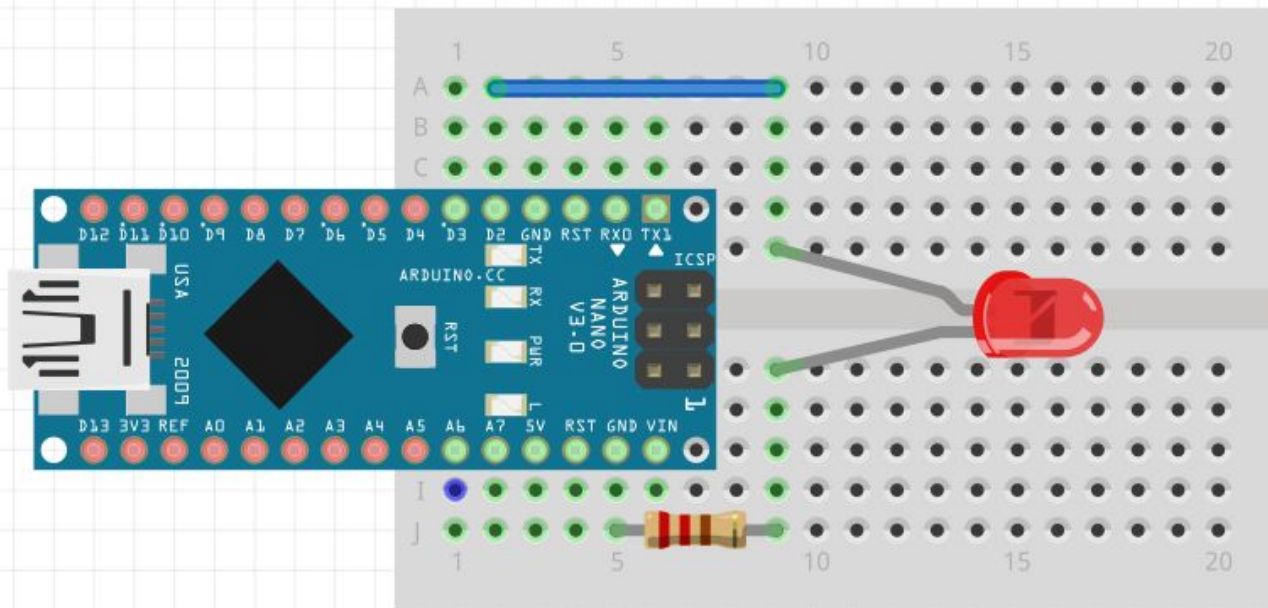
[01]





# Utripanje lučke

[02]



```
int LED = 2;

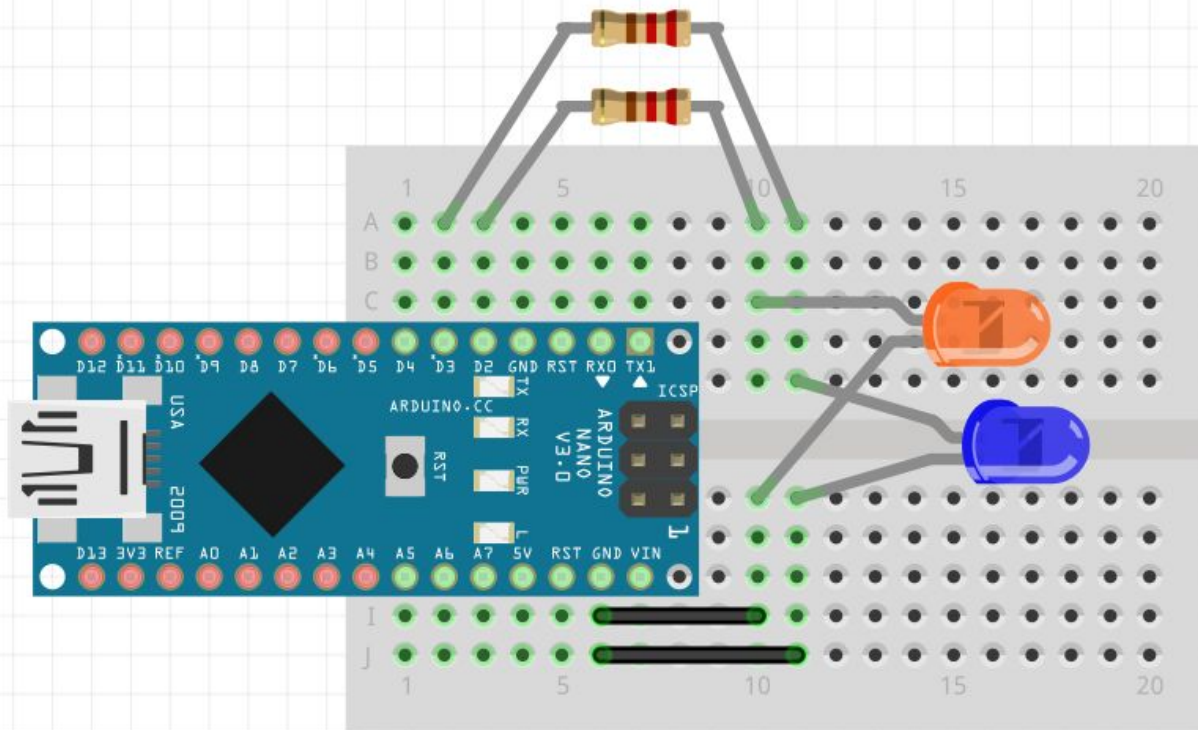
void setup() {
  pinMode(LED, OUTPUT);
}

void loop() {
  digitalWrite(LED, HIGH);
  delay(1000);
  digitalWrite(LED, LOW);
  delay(1000);
}
```



# Izmenično utripanje

[03]



```
int led_one = 2;
int led_two = 3;

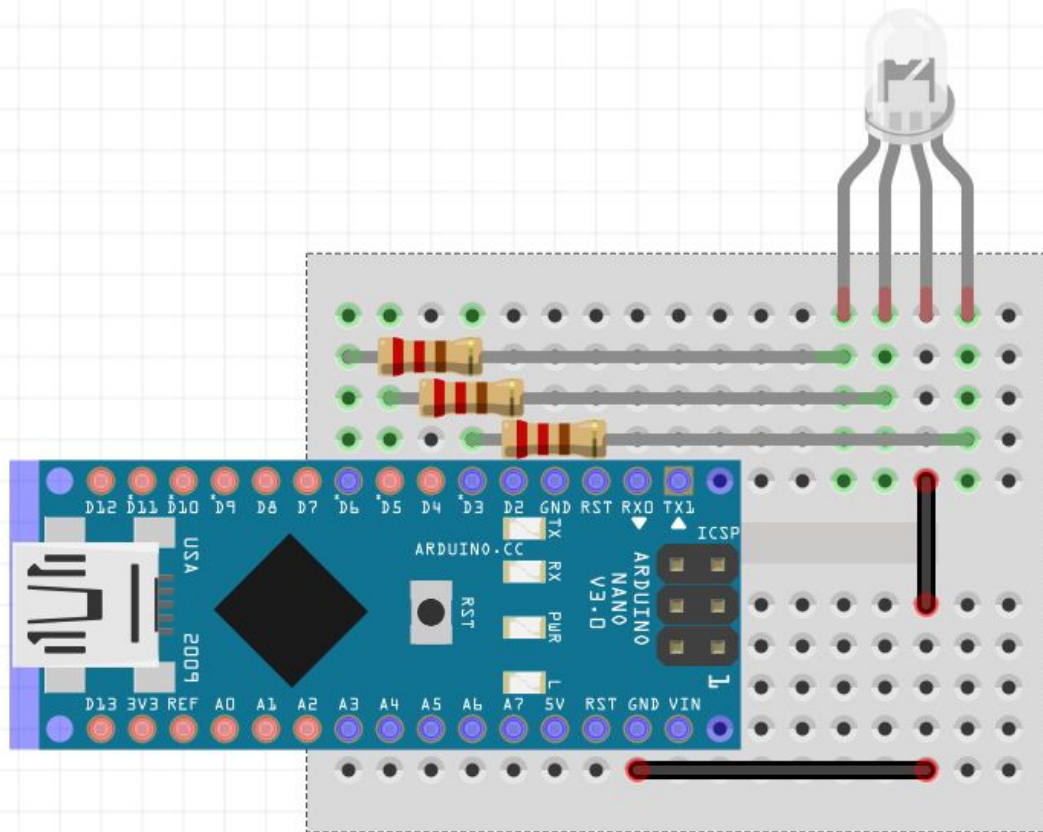
void setup() {
    // set up LED as OUTPUT
    pinMode(led_one, OUTPUT);
    pinMode(led_two, OUTPUT);
}

void loop() {
    digitalWrite(led_one, HIGH);
    digitalWrite(led_two, LOW);
    delay(500); // wait 0.5 second
    digitalWrite(led_one, LOW);
    digitalWrite(led_two, HIGH);
    delay(500); // wait 0.5 second
}
```



# RGB lučka

PWM pins \*



[04]  
[05]

# RGB lučka menja barve

[04]

- Red
- Green
- Blue

```
int redPin = 3;
int greenPin = 6;
int bluePin = 5;

void setup() {
  pinMode(redPin, OUTPUT);
  pinMode(greenPin, OUTPUT);
  pinMode(bluePin, OUTPUT);
}

void loop()
{
  setColor(255, 0, 0); // red
  delay(500);
  setColor(0, 255, 0); // green
  delay(500);
  setColor(0, 0, 255); // blue
  delay(500);
}

void setColor(int red, int green, int blue)
{
  analogWrite(redPin, red);
  analogWrite(greenPin, green);
  analogWrite(bluePin, blue);
}
```

# RGB lučka pulzajoče barve

[05]

```
int redPin = 3;
int greenPin = 6;
int bluePin = 5;
int i;

void setup() {
    // set up OUTPUTS
    pinMode(redPin, OUTPUT);
    pinMode(greenPin, OUTPUT);
    pinMode(bluePin, OUTPUT);
}

void loop()
{
    for (i=0; i<=255; i++) {
        analogWrite(redPin, 0);
        analogWrite(greenPin, 0);
        analogWrite(bluePin, i);
        delay(5);
    }
}
```

# Senzorji in serial port

06\_photo\_resistor

```
int sensorPin = A7;
```

```
void setup() {  
  Serial.begin(9600);
```

```
}
```

```
void loop()
```

```
  Serial.println(analogRead(sensorPin));
```

bytes of program storage space. Maximum is 3072  
use 188 b of dynamic memory, leaving 1860 b  
Arduino Nano, ATmega328P on/dev/ttyUSB0

☒ Autoscroll

No line ending

9600 baud

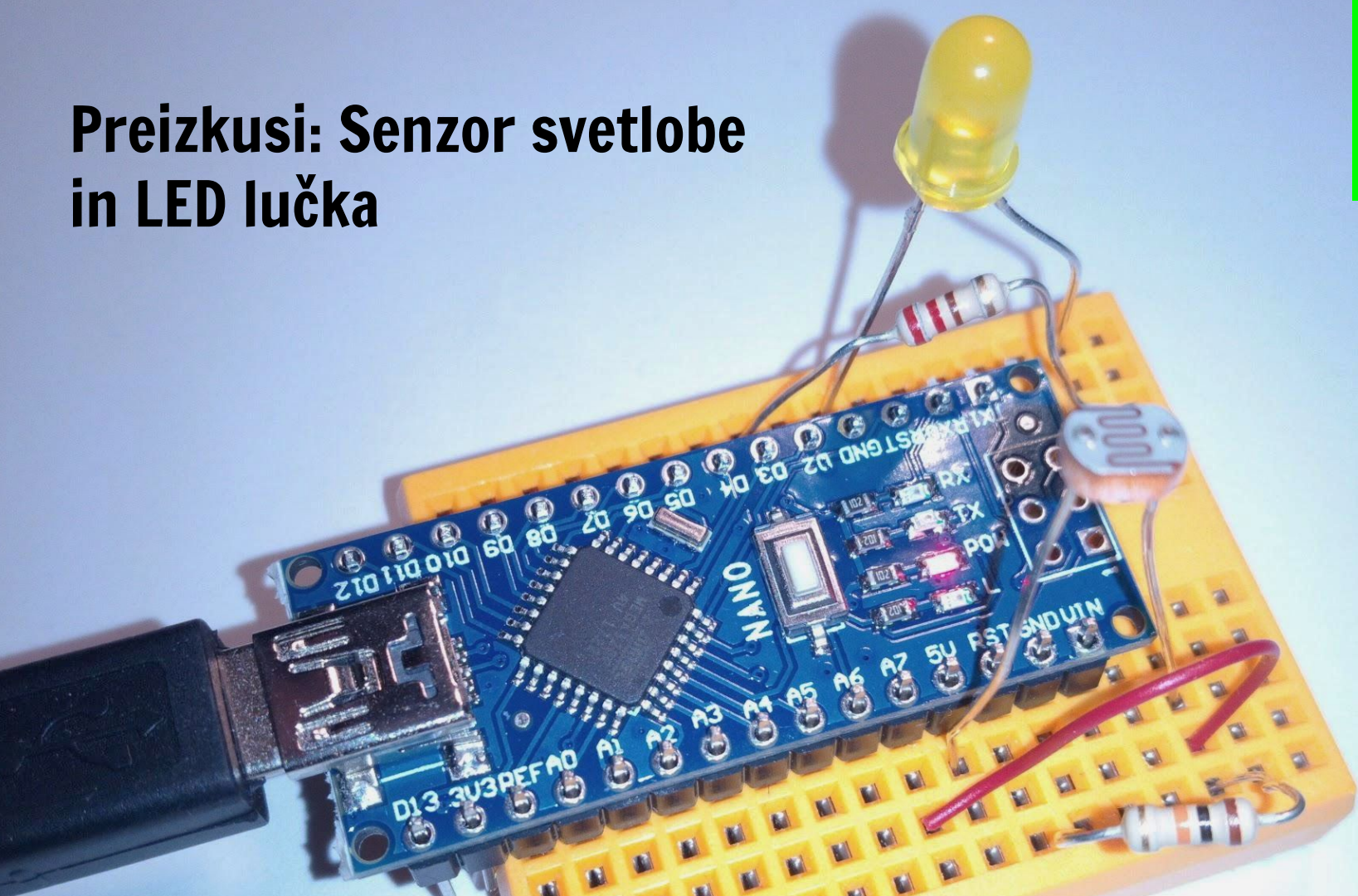
**[ 06 ]**





# Preizkusi: Senzor svetlobe in LED lučka

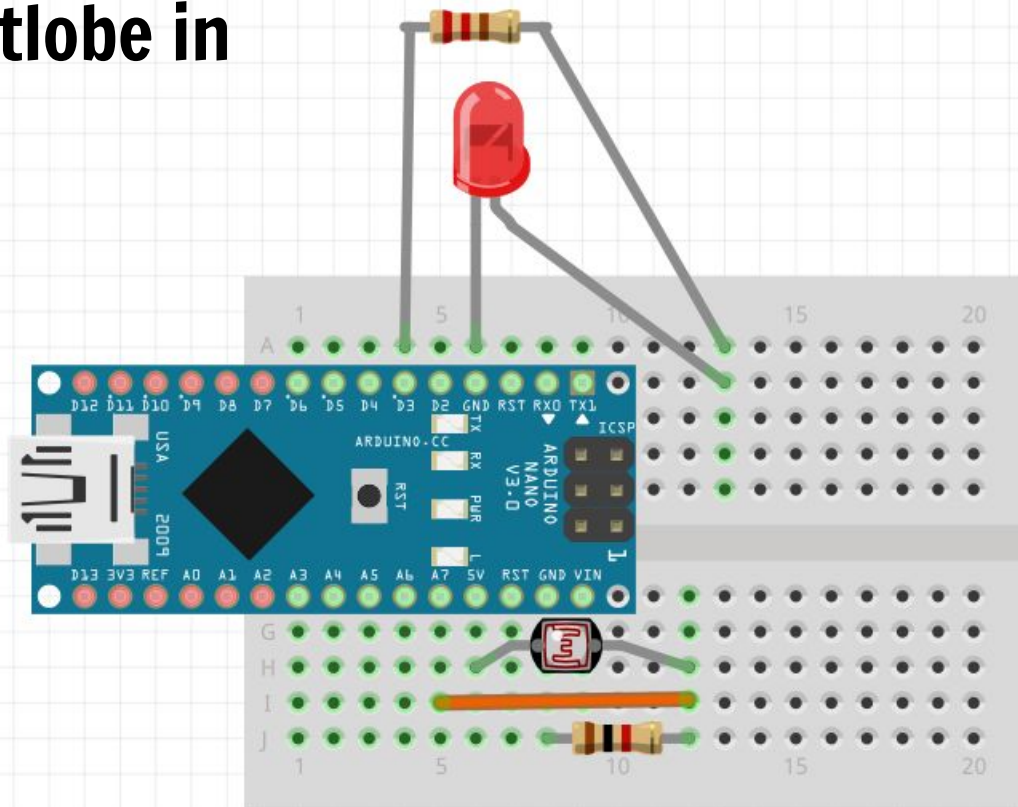
[07]





# Senzor svetlobe in LED lučka

[07]



```
int sensorPin = A7;
int led = 3;
int input;
int output;

void setup() {
    Serial.begin(9600);
}

void loop()
{
    input = analogRead(sensorPin);
    output = input / 4;
    delay(1000);
    analogWrite(led, output);
    Serial.print( input);
    Serial.print( " - ");
    Serial.println( output);
}
```

# Processing Demo

# Processing

[Cover](#)[Download](#)[Donate](#)[Exhibition](#)[Reference](#)[Libraries](#)[Tools](#)[Environment](#)[Tutorials](#)[Examples](#)[Books](#)

Download Processing. Processing is available for Linux, Mac OS X, and Windows. Select your choice to download the software below.



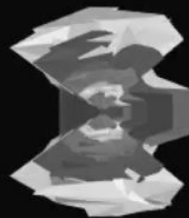
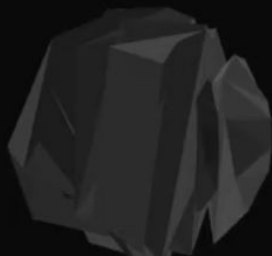
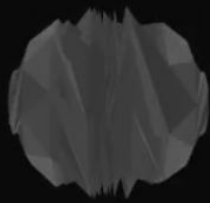
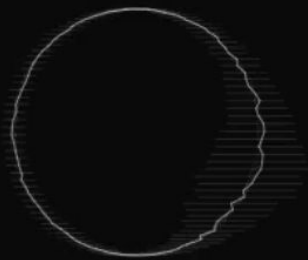
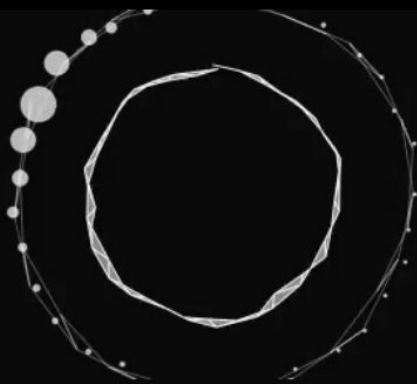
3.3.6 (4 September 2017)

[Windows](#) 64-bit[Windows](#) 32-bit[Linux](#) 64-bit[Linux](#) 32-bit[Linux](#) ARMv6hf[Mac OS X](#)[» Github](#)

Read about the [changes in 3.0](#). The [list of revisions](#) covers the differences

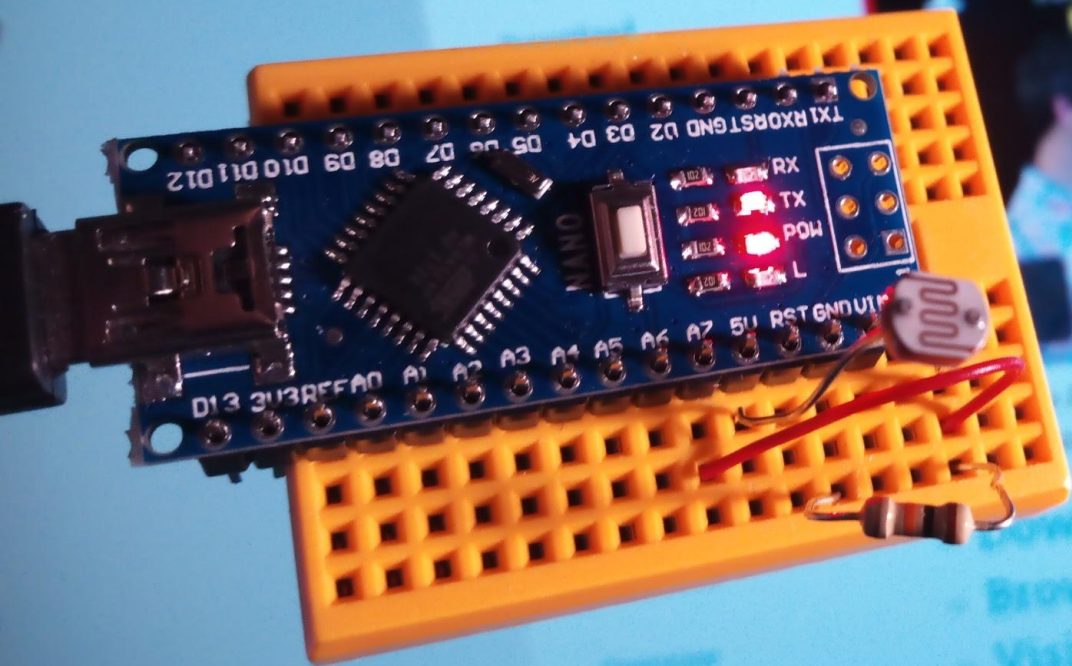
<https://processing.org/download/>

[Shop](#)



# Processing

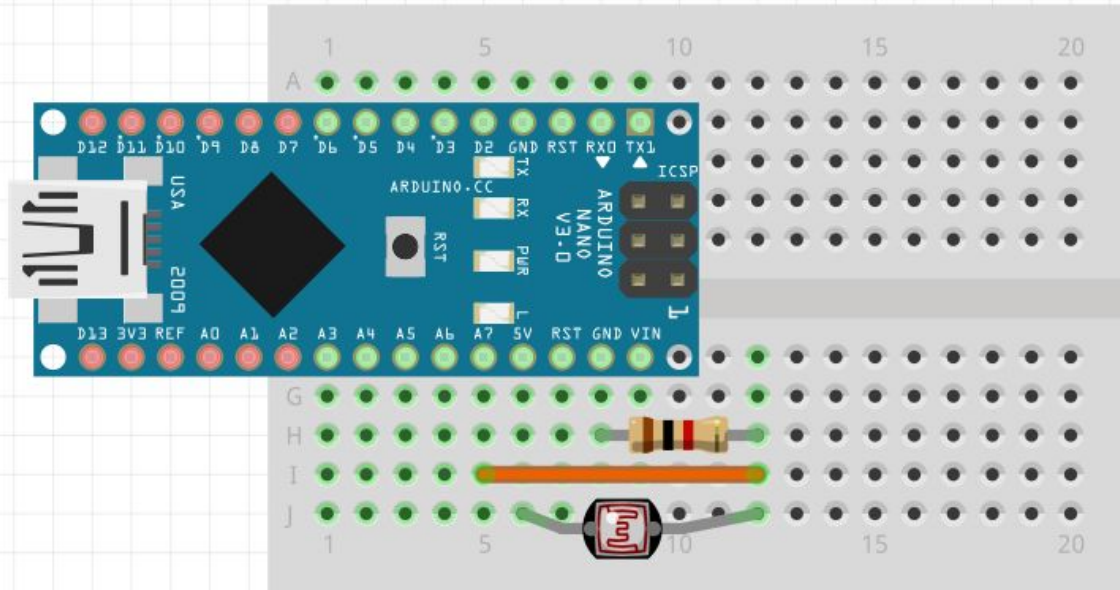
[08]





# Foto-upornik & Serial port

[08]



```
int sensorPin = A7;
int input;
int output;

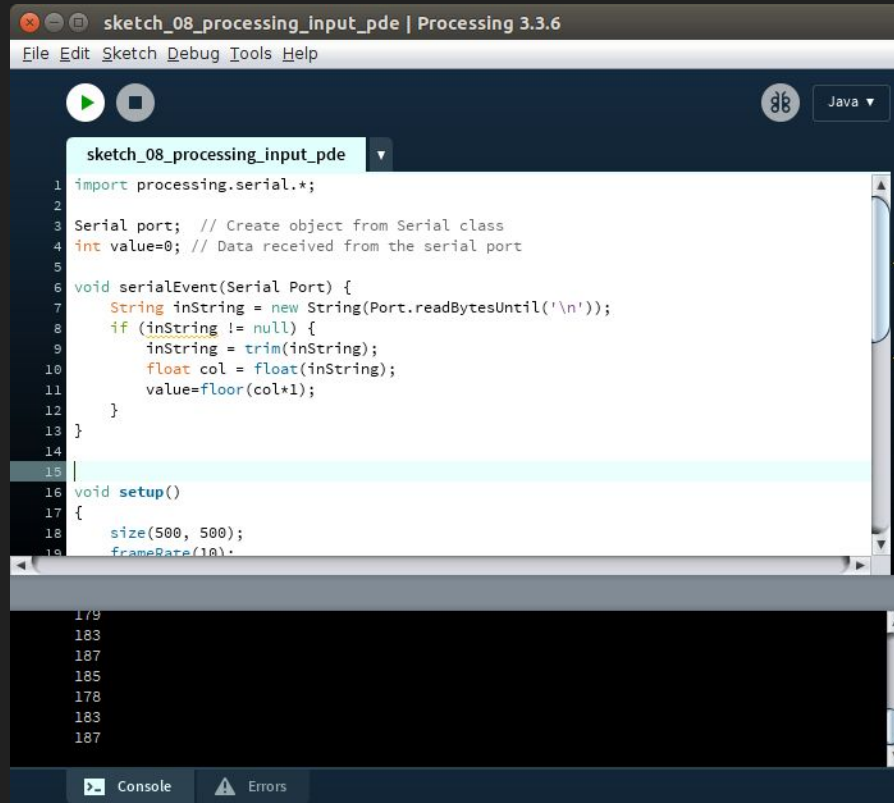
void setup() {
    Serial.begin(9600);
}

void loop()
{
    input = analogRead(sensorPin);
    output = input / 4;
    delay(10);
    Serial.println( output );
}
```



# Processing sketch

[08]



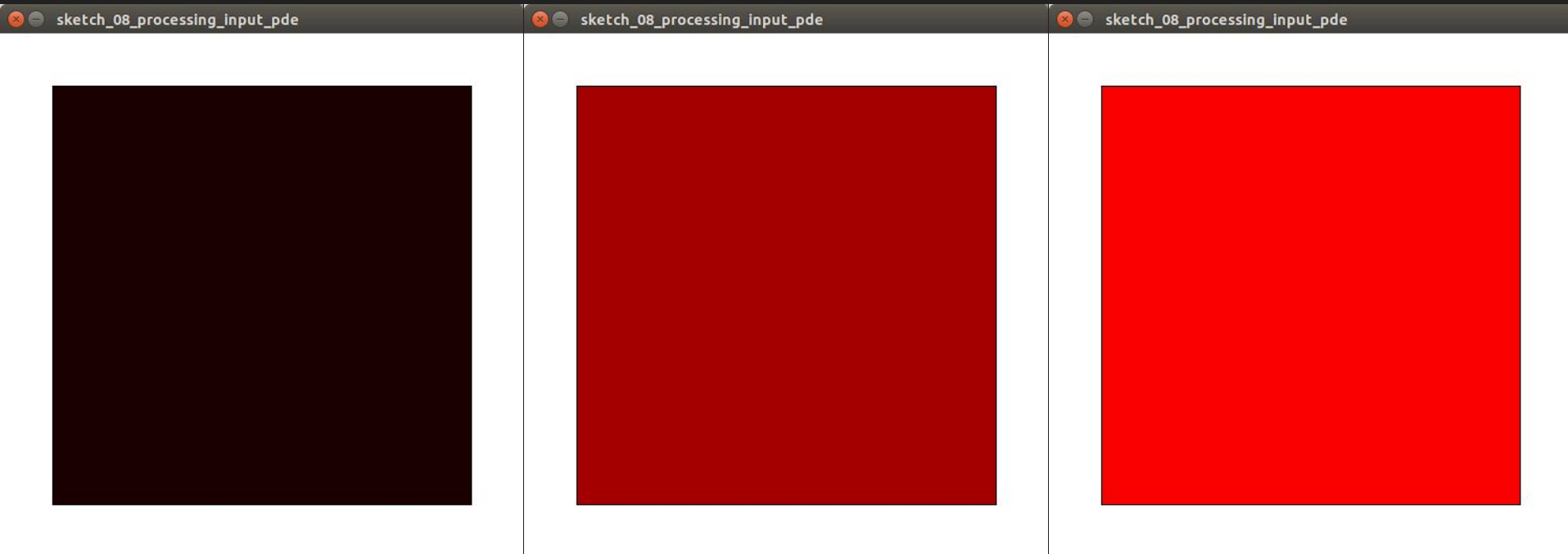
The screenshot shows the Processing IDE interface. The title bar reads "sketch\_08\_processing\_input\_pde | Processing 3.3.6". The menu bar includes "File", "Edit", "Sketch", "Debug", "Tools", and "Help". Below the menu bar are icons for running (a green play button) and stopping (a square button), and a language dropdown menu set to "Java". The sketch name "sketch\_08\_processing\_input\_pde" is displayed in a dropdown menu. The main text area contains the following Java code:

```
1 import processing.serial.*;
2
3 Serial port; // Create object from Serial class
4 int value=0; // Data received from the serial port
5
6 void serialEvent(Serial Port) {
7     String inString = new String(Port.readBytesUntil('\n'));
8     if (inString != null) {
9         inString = trim(inString);
10        float col = float(inString);
11        value=floor(col*1);
12    }
13 }
14
15
16 void setup()
17 {
18     size(500, 500);
19     frameRate(18);
```

At the bottom of the IDE, there is a "Console" tab and an "Errors" tab, both of which are currently empty.

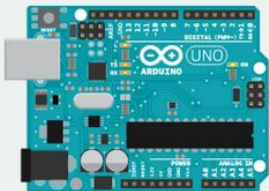
# Processing - Resultat

[08]



**Povezave**

## WHAT IS ARDUINO?



BUY AN ARDUINO



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BLOG



THE IMPERIALIZER MAKES  
QUICK WORK OF METRIC  
CONVERSIONS



REDEFINING THE  
LEARNING EXPERIENCE  
ONE CLASSROOM  
AT A TIME



BLOG



ARDUINO MKR ZERO,  
THE POWER OF THE  
ZERO IN A SMALLER

<https://www.arduino.cc/>

and access cool tutorials!



## THE ALEXA AND ARDUINO SMART HOME CHALLENGE

CREATE THE SMART HOME GADGET OF THE FUTURE

IN PARTNERSHIP WITH AMAZON ALEXA

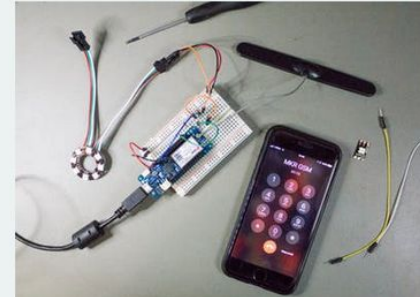
All products ▾

All categories ▾

Trending ▾

Any difficulty ▾

Any type ▾



<https://create.arduino.cc/projecthub>

77 VIEWS 0 COMMENTS 1 RESPECT

1,916 VIEWS 0 COMMENTS 4 RESPECTS

1,596 VIEWS 0 COMMENTS 7 RESPECTS



## EDITOR

Sketchbook

Examples

Libraries

Monitor

Help

Preferences

SEARCH EXAMPLES

SHOW EXAMPLES FOR ALL BOARDS

BUILT IN

FROM LIBRARIES

### 01.BASICS (6)

AnalogReadSerial

BareMinimum

Blink

DigitalReadSerial

Fade

ReadAnalogVoltage

### 02.DIGITAL (9)

### 03.ANALOG (6)

### 04.COMMUNICATION (12)

### 05.CONTROL (6)

### 06.SENSORS (4)

Blink



No Plugin Connection. Uploading is disabled until you reconnect.

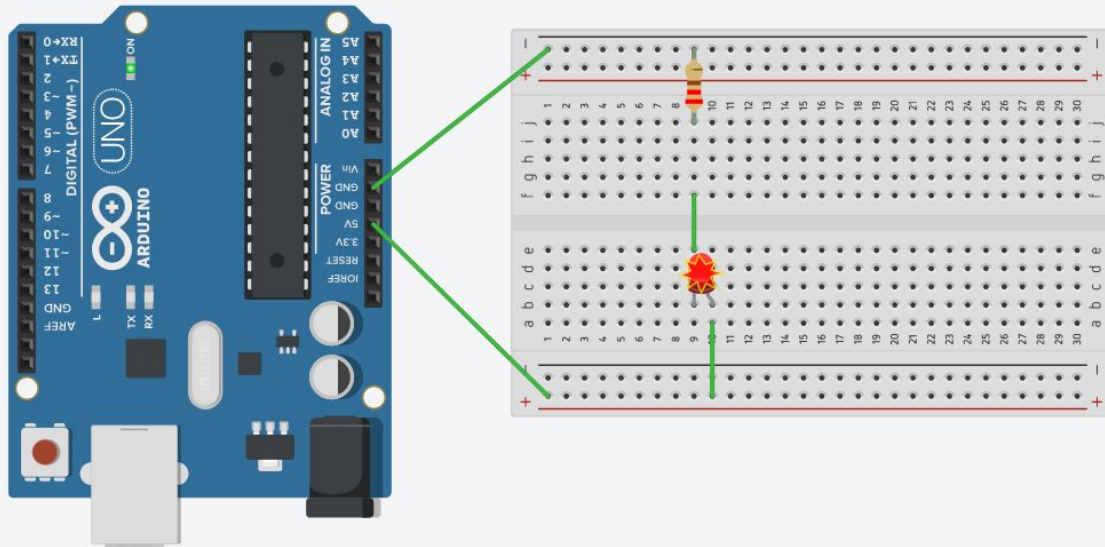
HELP

Blink.ino

Blink.txt

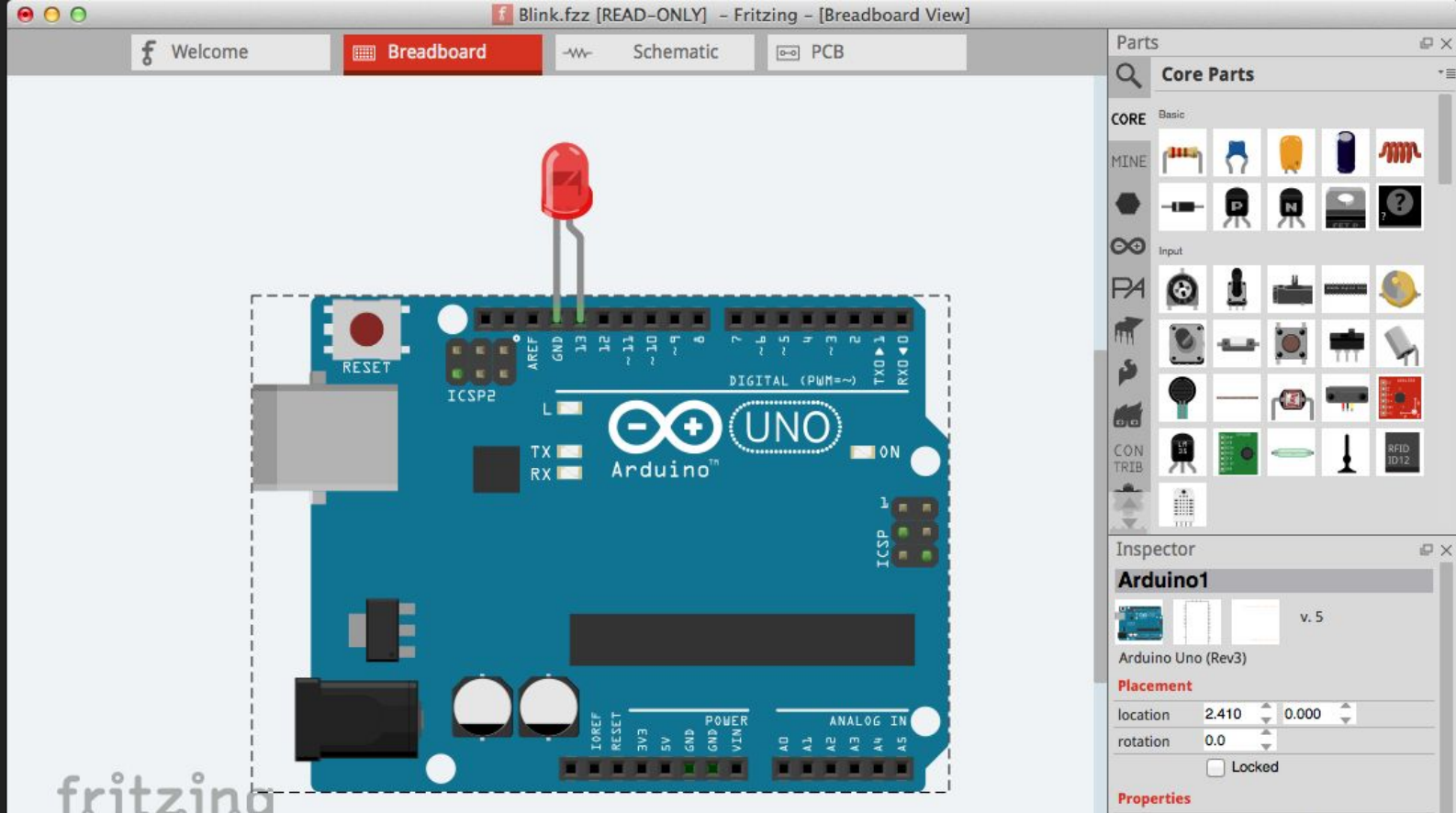
```
1  /*
2  Blink
3
4  Turns an LED on for one second, then off for one second, repeatedly.
5
6  Most Arduinos have an on-board LED you can control. On the UNO, MEGA and ZERO
7  it is attached to digital pin 13, on MKR1000 on pin 6. LED_BUILTIN is set to
8  the correct LED pin independent of which board is used.
9  If you want to know what pin the on-board LED is connected to on your Arduino
10 model, check the Technical Specs of your board at:
11 https://www.arduino.cc/en/Main/Products
12
13 modified 8 May 2014
14 by Scott Fitzgerald
15 modified 2 Sep 2016
16 by Arturo Guadalupi
17 modified 8 Sep 2016
18 by Colby Newman
19
20 This example code is in the public domain.
21
22 http://www.arduino.cc/en/Tutorial/Blink
23 */
24
25 // the setup function runs once when you press reset or power the board
26 void setup() {
27   // initialize digital pin LED_BUILTIN as an output.
28   pinMode(LED_BUILTIN, OUTPUT);
29 }
30
31 // the loop function runs over and over again forever
32 void loop() {
33   digitalWrite(LED_BUILTIN, HIGH); // turn the LED on (HIGH is the voltage level)
34   delay(1000); // wait for a second
35   digitalWrite(LED_BUILTIN, LOW); // turn the LED off by making the voltage LOW
36   delay(1000); // wait for a second
37 }
38
```

# <https://create.arduino.cc/editor>



<https://www.tinkercad.com/>





<http://fritzing.org/download/>



smak(shop)



RAČUN



KOŠARICA

Išči po celotni trgovini...



AKCIJA

NOVO

ARDUINO/GENUINO

SBC

SPARKFUN

I/O

MAKERBEAM

TCT

3D

DRONI

OSTALO

SMAKSHOP : GENUINO/ARDUINO, LILYPAD, MAKERBEAM, 3D (TISKALNIKI, ABS, PLA), SPARKFUN

ARDUINO  
za vsakogar



AKCIJA



in-a-box



NAROČI SE NA OBJAVE

\* potrebna polja

email \*

Ime in priimek \*

NAROČI SE

**Način dostave po pošti (Pošta Slovenije d.o.o.).**

Strošek dostave je 3,55 EUR in brezplačna dostava pri naročilih nad 99,00 EUR.

**Način dostave osebni prevzem na lokaciji podjetja.**

Predhodno se je potrebno dogovoriti za termin prevzema.

**Podpora kupcem (med 8:30-15:30, Pon - Pet)**

elektronska pošta  
tel: 041 3344 86

<https://smakshop.si>

149,99 € 129,99 €

299,99 € 249,99 €



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DX » "arduino"

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- Repair Parts and Tools(1)
- R/C Tanks(1)

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- Gadgets(1)
- NFC/Smart Control(1)

#### Automobiles & Motorcycles(2)

- Gadgets & Auto Parts(2)
- Other Gadgets(2)

#### Electrical & Tools(1191)

- Arduino & SCM Supplies(1155)
- Raspberry Pi(21)
- Other Accessories(104)
- Boards & Shields(294)
- Sensors(274)

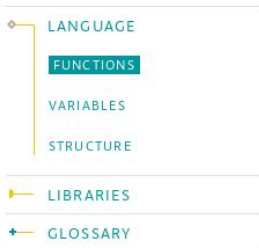
### arduino(1198)



#### Promotion Products



<http://www.dx.com/s/arduino>



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Find anything that can be improved? Suggest corrections and new documentation via GitHub.

Doubts on how to use Github? Learn everything you need to know in this tutorial.

## Language Reference

Arduino programming language can be divided in three main parts: structure, values (variables and constants), and functions.

### FUNCTIONS

For controlling the Arduino board and performing computations.

#### Digital I/O

`digitalRead()`

`digitalWrite()`

`pinMode()`

#### Analog I/O

`analogRead()`

`analogReference()`

`analogWrite()`

<https://www.arduino.cc/reference/en/>

Advanced I/O

`noTone()`

`pulseIn()`