



# Orientation Project 2023 – Part 1 – Arduino environment

Orig. slides by Aku Valmu

# Assessment and preliminary schedule

## Points

- § Max 30p
- § Min 6p

## Preliminary schedule

- § Arduino installation + assignment 1 - 3p
- § Blynk-application + assignment 2 - 3p
- § Temperature sensor - 3p
- § RGB-LED control – 6p
- § Project – 15p

# Part 1 – Arduino installation

1. Intro to Arduino
2. Creating a login to Arduino IDE ([arduino.cc](https://arduino.cc))
3. Installing Create Agent and Desktop IDE
4. Introduction to IDE
5. Coding..
6. Assignment

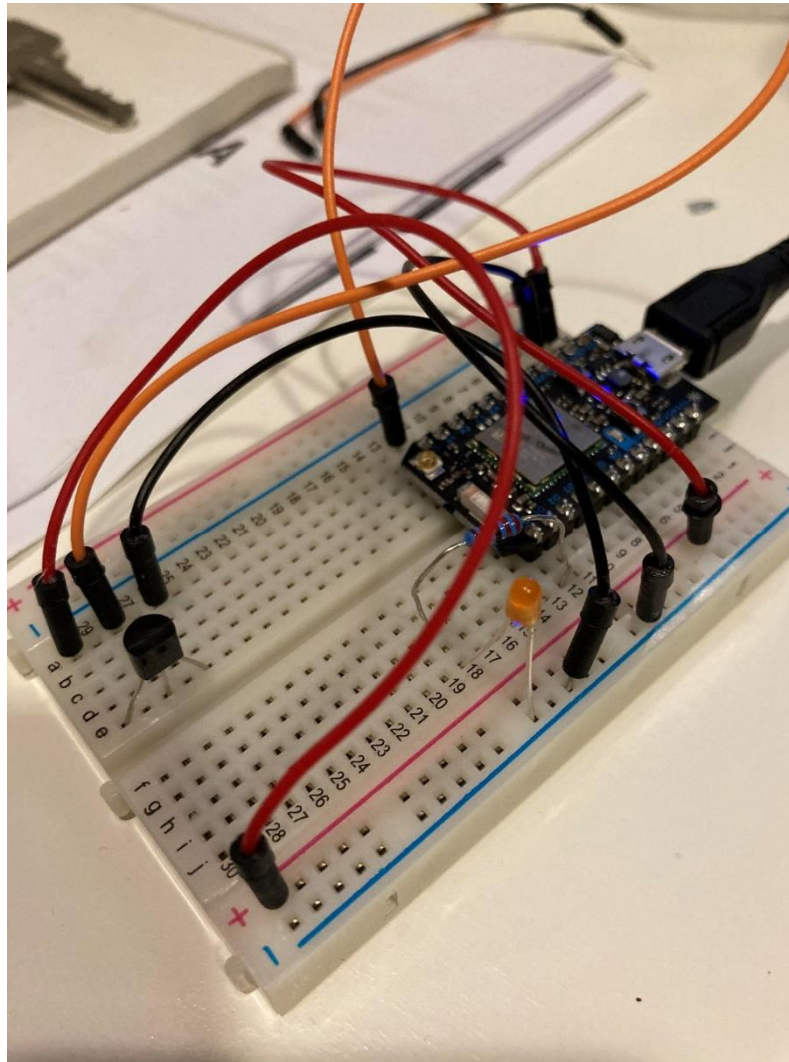
HW required: Arduino, breadboard, micro-USB-cable, LED and series resistor

# 1. Intro to Arduino

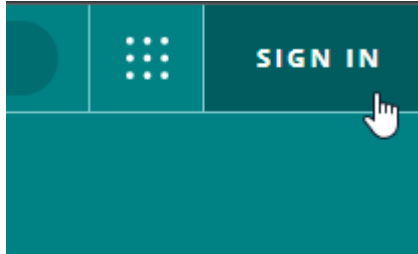
<https://docs.arduino.cc/static/fc77c3c3c77d69764ba7773df64c99db/ABX00/datasheet.pdf>



# 1. Intro to Arduino



## 2. Creating login to Arduino(arduino.cc)



1. Click *SIGN IN*
2. Select "Create one" and finish the registration.



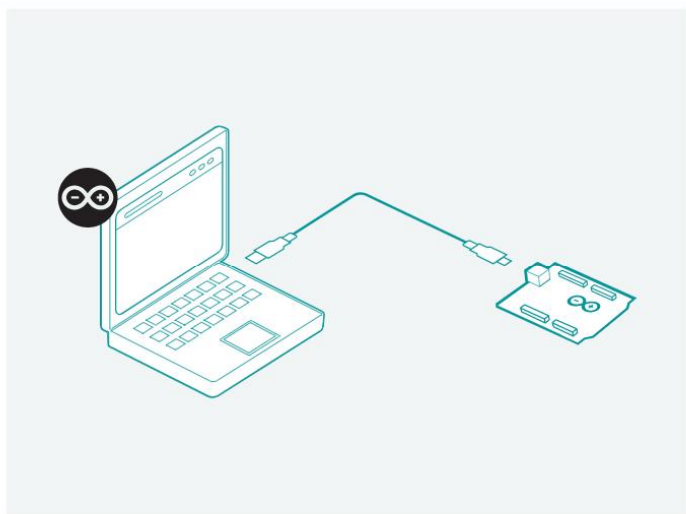
### 3. Installing Create Agent and Desktop IDE

1. Install Create Agent from  
<https://create.arduino.cc/getting-started/plugin/welcome>
2. Install Arduino IDE from  
<https://www.arduino.cc/en/software>

## 3. Installing Create Agent

<https://create.arduino.cc/getting-started/plugin/welcome>

WELCOME TO THE ARDUINO CREATE AGENT INSTALLATION!



You're about to begin the process of downloading and installing the Arduino Create Agent. The agent will provide you with several features:

- Recognize Arduino boards and other supported devices connected to your computer via USB;
- Upload sketches from your web browser to your boards via USB or through a network;
- Read data from serial monitor, as well as write to it.

START

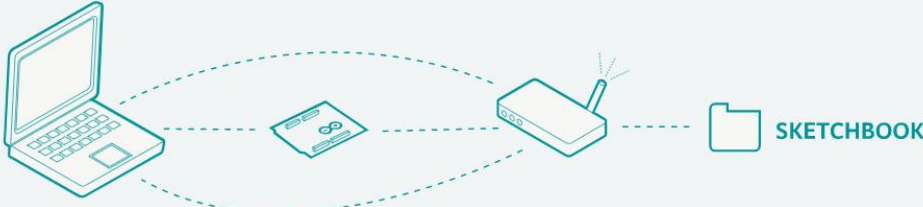


## 3. Installing Create Agent

DOWNLOAD THE CREATE AGENT FOR WINDOWS

**SETUP STEPS**

1. DOWNLOAD AGENT
2. INSTALL AGENT
3. CONGRATULATIONS!



You need to download and install the Create Agent to be able to upload sketches from Arduino Cloud to your board. Please note that you have to be Administrator of your system to install the Agent. Administrative privileges aren't required for MacOS El Capitan or an earlier version.

Source code for the Create Agent is available on [GitHub](#).

DOWNLOAD FOR WIN32


DOWNLOAD FOR WIN64

## 3. Installing Create Agent

AGENT CORRECTLY INSTALLED!

**SETUP STEPS**

- ✓ DOWNLOAD AGENT
- 2. INSTALL AGENT
- 3. CONGRATULATIONS!



ARDUINO CREATE AGENT TRAY ICON

You should now see the Arduino icon on the bottom bar of your Desktop. Click on the tray icon to pause the agent or to visit the Arduino Cloud webpage.

If you happen to close the agent, you can relaunch the agent as you would any other application.

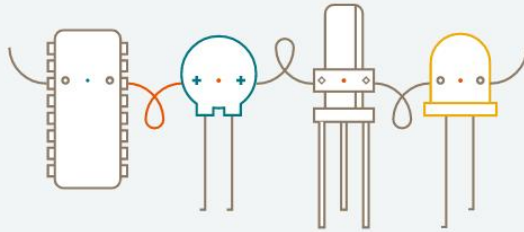
**NEXT**

## 3. Installing Create Agent

CONGRATULATIONS! YOU'RE ALL SET.

SETUP STEPS

- ✓ DOWNLOAD AGENT
- ✓ INSTALL AGENT
- 3. CONGRATULATIONS!



The Arduino Create Agent has been installed correctly and it's up and running! Go the the [Web Editor](#) and try it out!

GO TO WEB EDITOR

## 3. Installing Arduino IDE

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

### Downloads



The screenshot shows the Arduino IDE 2.0.0 download page. On the left, there is a section with the Arduino logo, the title 'Arduino IDE 2.0.0', and a description: 'The new major release of the Arduino IDE is faster and even more powerful! In addition to a more modern editor and a more responsive interface it features autocompletion, code navigation, and even a live debugger.' Below this, it says 'For more details, please refer to the [Arduino IDE 2.0 documentation](#).' and 'Nightly builds with the latest bugfixes are available through the section below.' At the bottom, under 'SOURCE CODE', it says 'The Arduino IDE 2.0 is open source and its source code is hosted on [GitHub](#).' On the right, there is a teal box titled 'DOWNLOAD OPTIONS' with the following links: 'Windows Win 10 and newer, 64 bits', 'Windows MSI installer', 'Windows ZIP file', 'Linux AppImage 64 bits (X86-64)', 'Linux ZIP file 64 bits (X86-64)', and 'macOS 10.14: "Mojave" or newer, 64 bits'.

**Arduino IDE 2.0.0**

The new major release of the Arduino IDE is faster and even more powerful! In addition to a more modern editor and a more responsive interface it features autocompletion, code navigation, and even a live debugger.

For more details, please refer to the [Arduino IDE 2.0 documentation](#).

Nightly builds with the latest bugfixes are available through the section below.

**SOURCE CODE**

The Arduino IDE 2.0 is open source and its source code is hosted on [GitHub](#).

**DOWNLOAD OPTIONS**

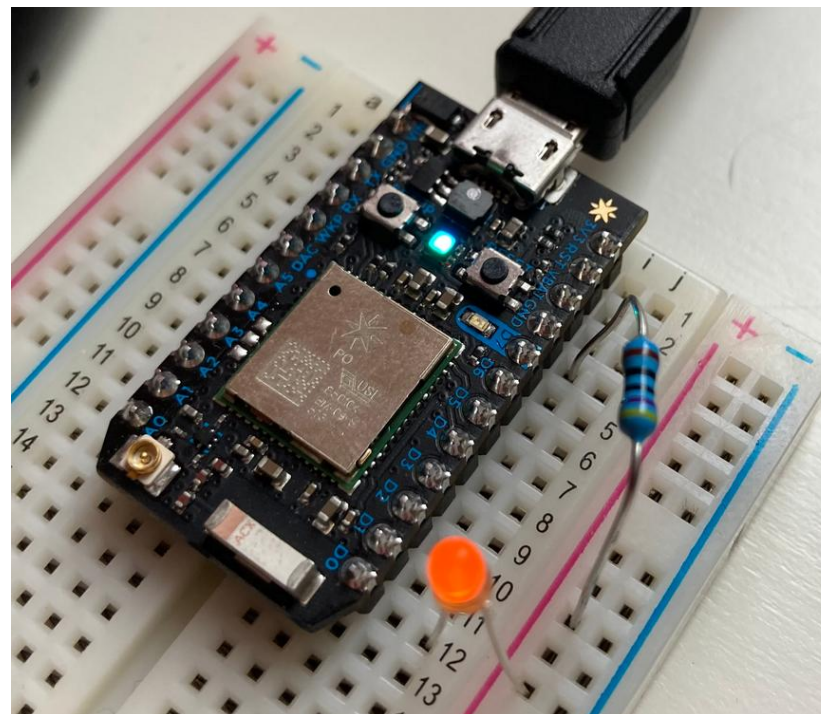
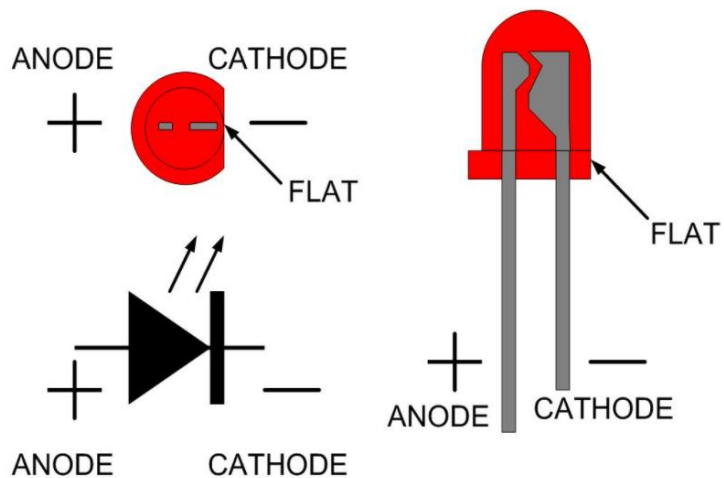
- Windows** Win 10 and newer, 64 bits
- Windows** MSI installer
- Windows** ZIP file
- Linux** AppImage 64 bits (X86-64)
- Linux** ZIP file 64 bits (X86-64)
- macOS** 10.14: "Mojave" or newer, 64 bits

- Download and click *Next* to finish the installation

### 3. Arduino IDE

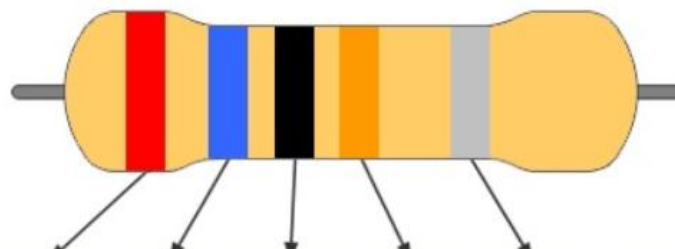
Task 1. Create a code that blinks the LED with frequency of 1 HZ.

# Connecting an external LED



# Connecting an external LED

Color	Voltage drop @ 20 mA
Red	1.8
Orange	2
Yellow	2.3
Green	3.5
Blue	3.6
White	4



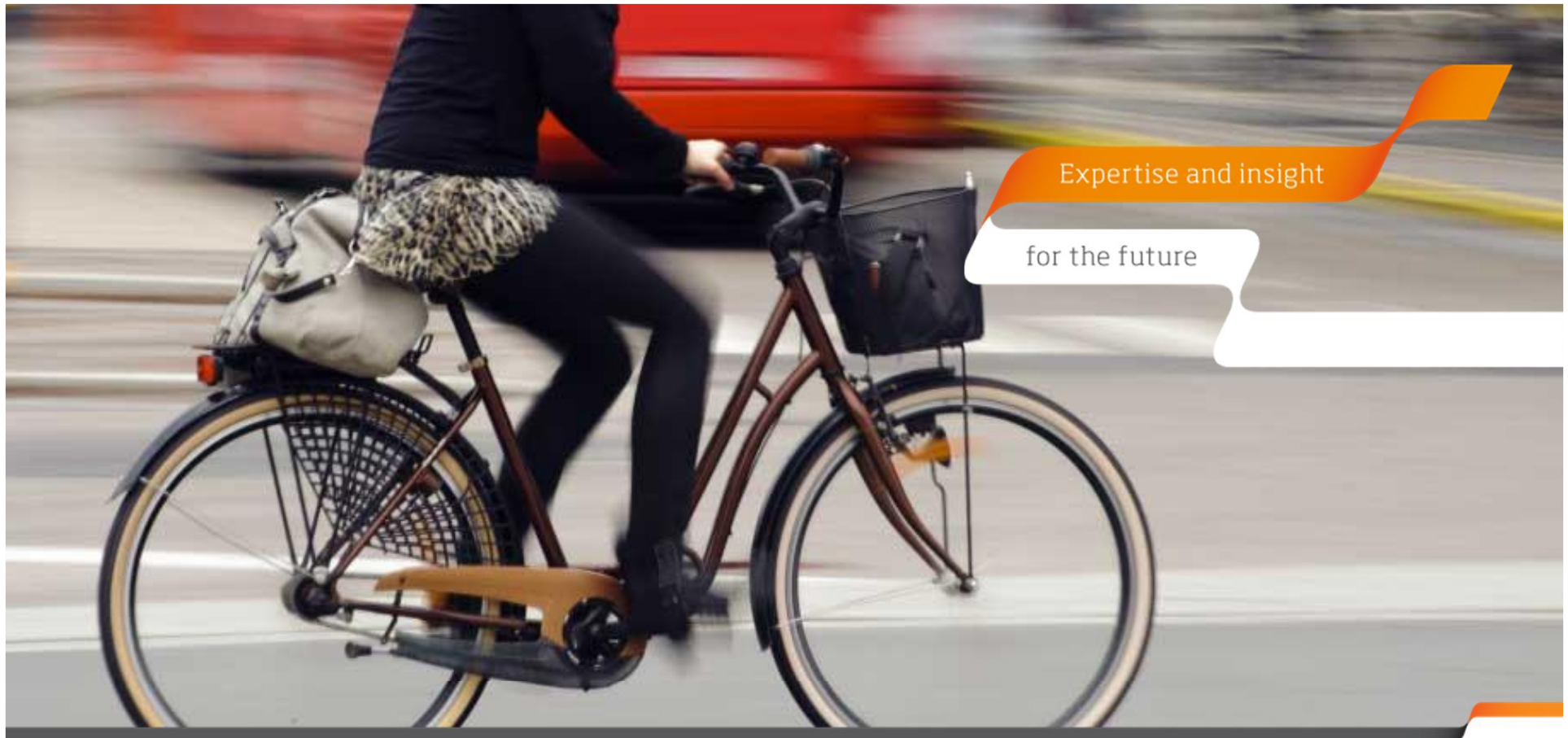
	1 <sup>st</sup> digit	2 <sup>nd</sup> digit	3 <sup>rd</sup> digit	multiply	tolerance	TCR (ppm/K)
Black	0	0	0	1	1% (F)	100
Brown	1	1	1	10	2% (G)	50
Red	2	2	2	100		15
Orange	3	3	3	1K		25
Yellow	4	4	4	10K		
Green	5	5	5	100K	0.5% (D)	
Blue	6	6	6	1M	0.25% (C)	10
Violet	7	7	7	10M	0.1% (B)	5
Gray	8	8	8	100M	0.05% (A)	
White	9	9	9	1G		
Gold				0.1	5% (J)	
Silver				0.01	10% (K)	
None					20% (M)	



## Assignment 1 (3p)

1. Create and implement code that blinks both internal and external LEDs with 0,5Hz frequency so that one LED is on and one is off, and then vise versa.
2. Create and implement code that blinks the internal LED with frequency of 2Hz and external LED with frequency of 0,2Hz.

Once ready, submit your code to OMA, *Assignment 1 – Blinking LEDs*. Add the names of team members with the submission.



THANK YOU!

[www.metropolia.fi/en/](http://www.metropolia.fi/en/)  
[www.facebook.com/MetropoliaAMK](https://www.facebook.com/MetropoliaAMK)  
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