

ELEC-C9820 ED Workshop, Exercise 2, 14-18.1.2019

(Same as with ELEC-A4010/A4910 Sähköpaja)

Getting to know Teensy

Find the instruction card for Teensy and flip to its Arduino side.

Parts: *Teensy 2.0*, breadboard, RGB led, resistors (e.g. 180, 220 and 270 ohm). The different colours in the RGB LEDs require different resistor values for balancing their brightness. Try out! (Note: The reset buttons in older Teensy boards are typically lost. You may reset the board with a pen or a toothpick.)

Task: Write a program that lights up all three channels and then fades at least one of the colours in a similar fashion as with the built-in Fade-example. Change your code and experiment!

Note: There are two kinds of RGB LEDs. Some of them feature a common anode (common plus, the LED is lit on the zero state) and the rest have common cathode (common minus). Those you find in the snack boxes are of the latter kind. Ask the assistant if you need help.

You can also experiment to use Arduino with batteries or network power. For programming you will still need the USB connection to a computer. The Sähköpaja space (or Kimmo) has also a more powerful version of Teensy (3.2), which has a digital-analog converter, which is missing from most Arduino variants.

Remember, that using Teensy requires installing the Teensyduino software. You can find it here: https://www.pjrc.com/teensy/td_download.html. The website also has helpful information about the board.

The computers at the Sähköpaja space have this software installed. Once you choose the 'Board' to be Teensy 2.0 you are good to go in a same fashion as using an Arduino UNO.

Arduino Libraries

Check out the examples at: <https://www.arduino.cc/en/Tutorial/LibraryExamples>. We recommend starting with *Liquid Crystal* (e.g. *Hello World*) and *Servo*-library examples *Knob* and *Sweep*.

Parts: Choose an LCD with pin numbering that corresponds that of Arduino instructions. You may need to solder break away headers under the display. When picking up servos, choose a small one. The USB powered board cannot deliver enough current to the bigger ones especially if it draws the power from a computer.

Common issues: If you see light squares when testing, try to adjust the contrast knob at the LCD. Another option is that a cable is loose. Beware that some of the jumper cables have seen their best days and may be broken... So, you may need to check the integrity of the cables as well.

And, if you have still time and end up rolling thumbs, you can try out the stepper motor example this week too: <http://bildr.org/2012/04/tb6612fng-arduino/> You may do this later as well.

Note that the green motor driver has the pins laid out in a different order as compared to the red one!

Remember diary keeping!