WORK PACKAGE 4: TINKERCAD

EXERCISE 1: INTERRUPTS ON TIMER

Create a system based on Arduino Uno or Arduino Yun, which measures the temperature and lids the LEDs. You should use 5 LEDs for the temperature measurement. The LEDs should be turned on depending on the temperature – e.g. for 0-10 degrees Celsius, 1 LED is turned on; for 11-20, 2 LEDs are turned on, and so on.

You should define for which temperature range the LEDs should be turned on, these should be provided as variables.

You should check for the temperature periodically, using interrupts. The period should be defined in the code.

Your task is to:

- Create a board
    - with the right number of LEDs
    - with the right wiring to prevent damage to components
    - use different colors for the LEDs for the different temperature intervals
- Write the code
    - Using interrupts
    - Using the definitions

Your solution should include:

- Screenshot/picture of the board
- Source code (in C)

EXERCISE 2: ANALOG TIMER

Create a system based on Arduino Uno or Arduino Yun which implements an analog timer (seconds only). You should use a motor module to move (Micro Servo in TinkerCad).

At the same time as the motor moves, the program should send the time to the serial port.

You should use the interrupts on timer for this exercise.

Optional: you can use a second servo to measure minutes, just like in an analog timer with minutes and seconds.

EXERCISE 3: ADDRESSABLE LEDS

Create a system based on Arduino Uno or Arduino Yun, which periodically measures one of the following:

- Temperature
- Sound (using sonic sensor), or
- Light intensity

Instead of using LEDs like in Exercise 1, you should use NeoPixel ring (addressable LEDs) to display the value based on the sensor. For example, the temperature based on the temperature sensor.

Since the NeoPixel ring is a ring, you should indicate that you reached the limit of LEDs by adding one more, standard red LED. The red LED should be ON after all NeoPixel ring's LEDs are ON.

Optional: you can add speaker (Pizo) to make a sound in addition to turning ON the red LED.