WORK PACKAGE 5: ARDUINO BOARD

Since this exercise requires an actual Arduino board, we cannot demonstrate all exercises during the demo session. Therefore, you should

- *Make a short movie demonstrating how your board works – one per exercise*
- *Upload all movies together with the code for each exercise.*

During the demonstration to the TA, you should pick one of the exercises (except for Exercise 1) and show it live to your TA.

EXERCISE 1: SET-UP

Create a simple system in Arduino Uno, which will use one LED to blink periodically, e.g. once a second. Add one more LED and a button. The second LED should be on when the button is pressed, and off, when the button is not pressed.

EXERCISE 2: TEMPERATURE METER

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 or delay(). 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 the definitions (#define) whenever needed.

EXERCISE 2: TEMPERATURE AND LIGHT METER

Create a system based on Arduino Uno or Arduino Yun, which measures the light intensity and temperature at the same time. The systems should monitor the dependency between these two measurements and warn about the deviations.

Normal dependencies, all other variables are treated as deviating values:

Temperature	Light intensity
< -12 °C	0 %
-12 °C - 0 °C	1% - 20%
0 °C - 20 °C	21% - 60%

	>= 21 °C	61% - 100%

The system should use periodically read the temperature and light intensity (periodicity, in seconds, should be provided as a variable in the program).

The system should use three LEDs to indicate the normal dependency (GREEN), deviation when the temperature is higher than it should be, given the Light intensity (RED), and the deviation when the temperature is lower than it should be (YELLOW or BLUE).

You can use DHT.h library for this exercise.