PON – Arduino workshop

29-11-2023

Radboud University

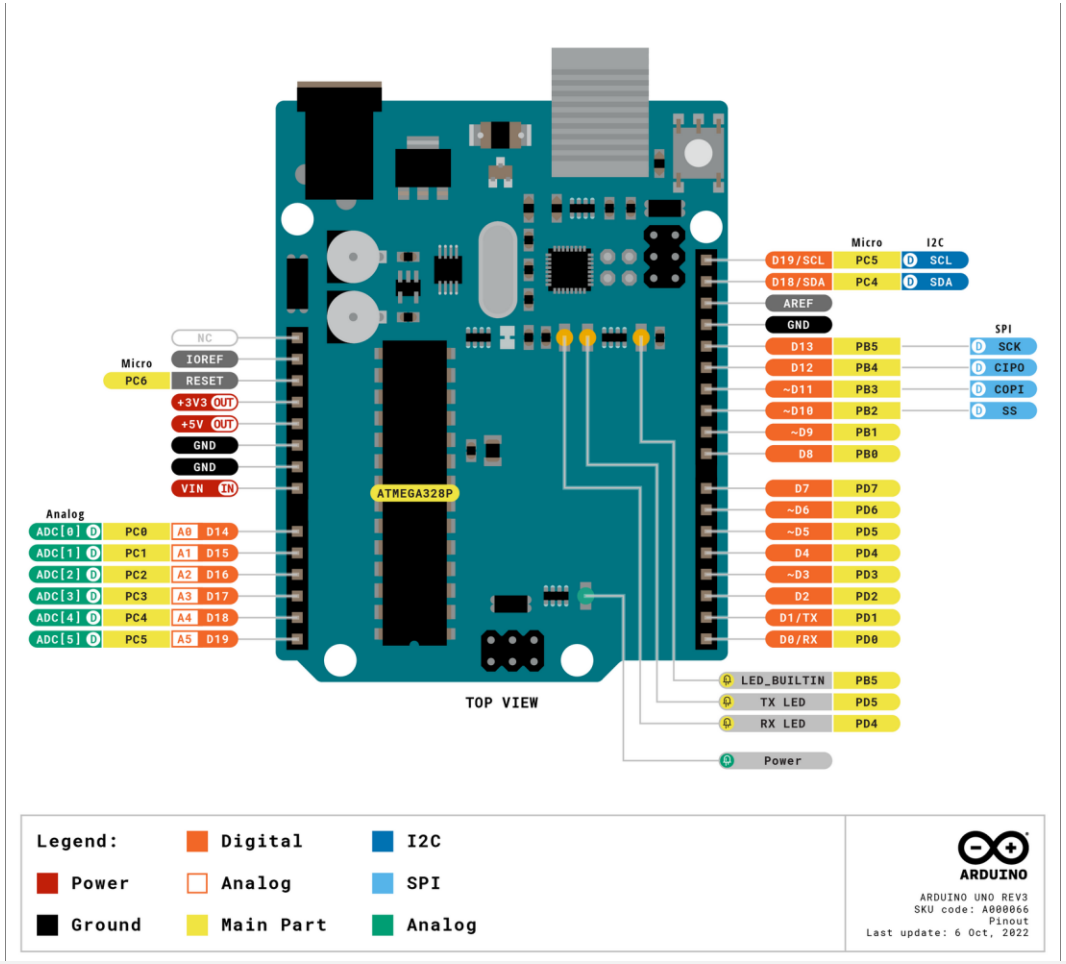
WHAT IS ARDUINO?

- An Italian open-source hardware and software company
- designs and manufactures single-board microcontrollers and microcontroller kits
- Boards are equipped with sets of digital and analog input/output (I/O) pins
- Can be connected to expansion boards or breadboards

ARDUINO UNO R3

- “UNO is the most robust board you can start playing with”
- based on the ATmega328P chip
- The ATmega328P also features 1kb of EEPROM
- It has 14 digital input/output pins and 6 analog inputs
- a USB connection
- a power jack
- Datasheet: https://docs.arduino.cc/resources/datasheets/A000066-datasheet.pdf

ARDUINO R3 PINOUT



WORKSHOP GOAL

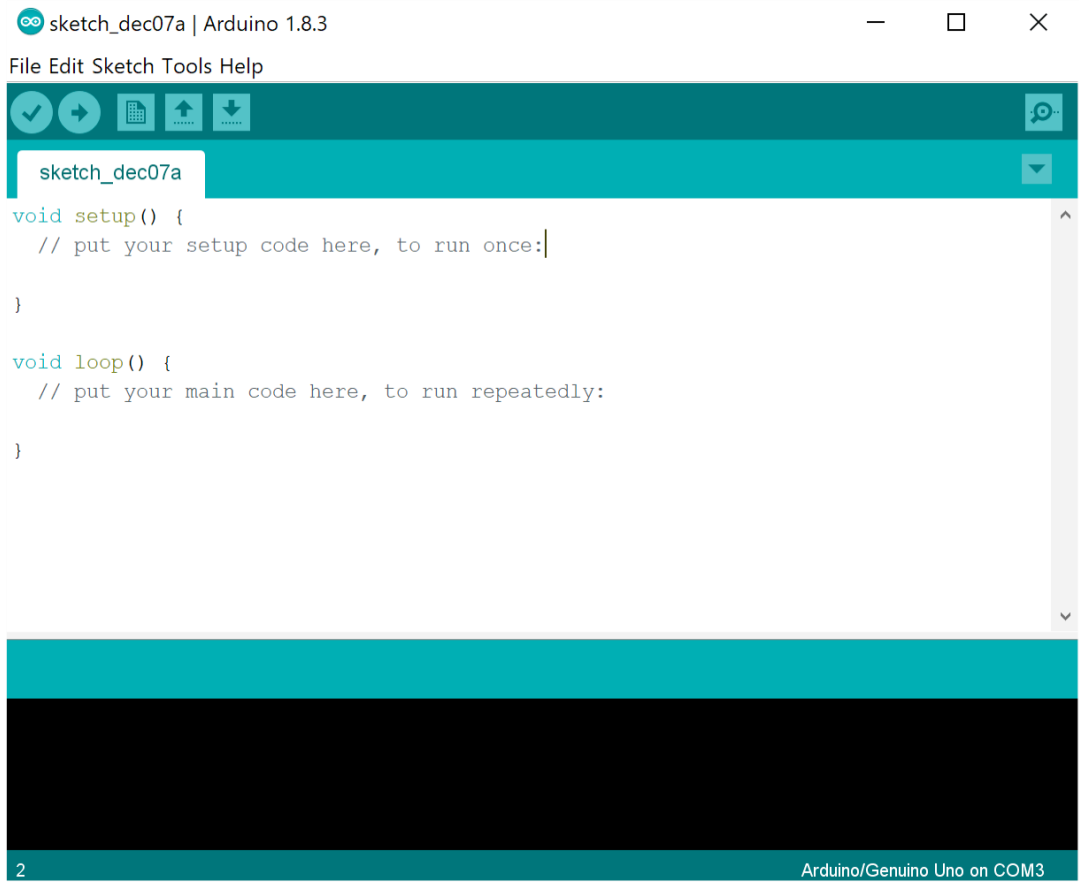
- “Smart garden” plant watering system
  - Moisture sensor measures moist degree
  - Arduino checks measurement value of sensor
  - Then, decides whether water pump must be activated
  - If soil is wet enough, Arduino stops pump
  - Result: healthy and happy plant!

ARDUINO DEVELOPMENT

Arduino IDE 2 software download:
https://www.arduino.cc/en/software

1. Install IDE 2 software
2. Connect board via USB cable

Do not put the power supply during development!



COMPONENTS

- Moisture sensor: https://www.instructables.com/Arduino-Soil-Moisture-Sensor/
  - Connect the two pins from the Sensor to the two pins on the Amplifier circuit via hook up wires.
  - Connect the Vcc from the Amplifier to the 3.3V pin on the Arduino and the Gnd pin to the Gnd pin on the Arduino.
  - Now connect the Analog Data Pin to the A0 pin on the Arduino (Since I'm interested in Analog Data).
- Water pump:
  - Connect the pin number 9 to one end of the pump
  - Connect the ground of Arduino to other end of the pump

SOURCE CODE

- Sourcecode (incl. this presentation) can be downloaded via a GitHub repo:
- https://github.com/Iso5786/PONArduino
  - *workshop.ino* contains skeleton and needs to be worked out further by participants
  - *solution.ino* contains full solution (please try to solve it initially by yourself via workshop.ino!)
- Language reference:
  - https://www.arduino.cc/reference/en/