

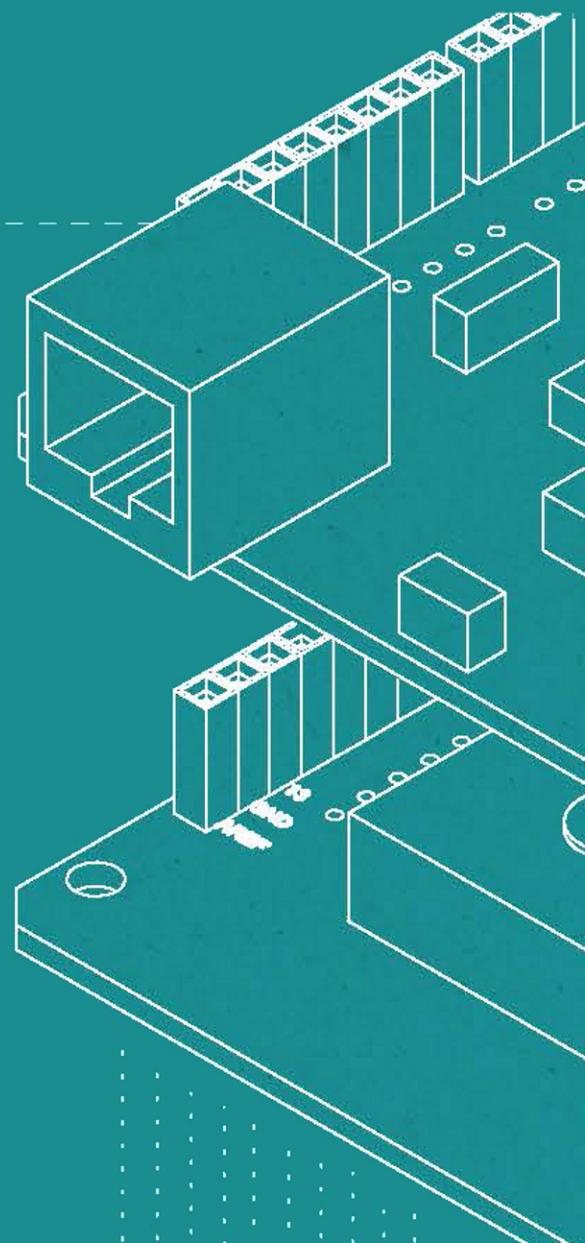


SOFTWARE AND ELECTRONICS

Shields: Are add-ons which can expand the functionality with Ethernet, Wi-Fi, Bluetooth, sensors, LCD-screens, buttons, motor control etc.

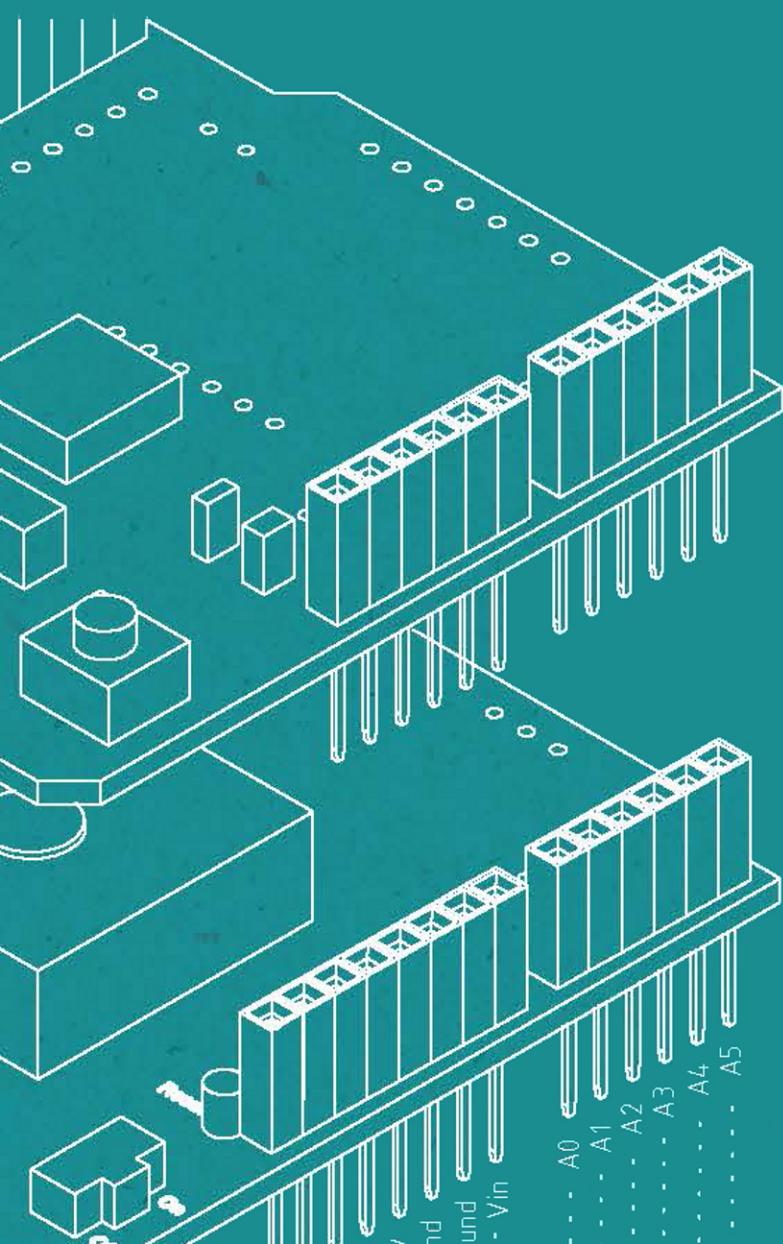
AN EXAMPLE ARDUINO - SKETCH:

```
// set pin numbers:  
int buttonPin = 2; // the number of the pushbutton pin  
int ledPin = 13; // the number of the LED pin ← COMMENTS ARE IGNORED  
  
int buttonState = 0; // variable for reading the pushbutton status. ← DON'T FORGET!  
  
void setup() {  
  // initialize the LED pin as an output:  
  pinMode(ledPin, OUTPUT);  
  // initialize the pushbutton pin as an input:  
  pinMode(buttonPin, INPUT);  
}  
  
void loop()  
{  
  // read the state of the pushbutton value:  
  buttonState = digitalRead(buttonPin); ← ASSIGNMENT  
  // check if the pushbutton is pressed.  
  // if it is, the buttonState is HIGH:  
  if (buttonState == HIGH) { ← COMPARISON : == EQUAL  
    // turn LED on:  
    digitalWrite(ledPin, HIGH); ← != NOT EQUAL  
  } ← < LESS THAN  
    ← > GREATER THAN  
    ← = EQUAL
```



EK

ICAL ENGINEERING KLUB



A0
A1
A2
A3
A4
A5
...
- Vin
Gnd

```
// select the input pin for the potentiometer
int sensorPin = A0;
// variable to store the value coming from the sensor
int sensorValue = 0;
//Read a value (0-1023) from "sensorPin"
```



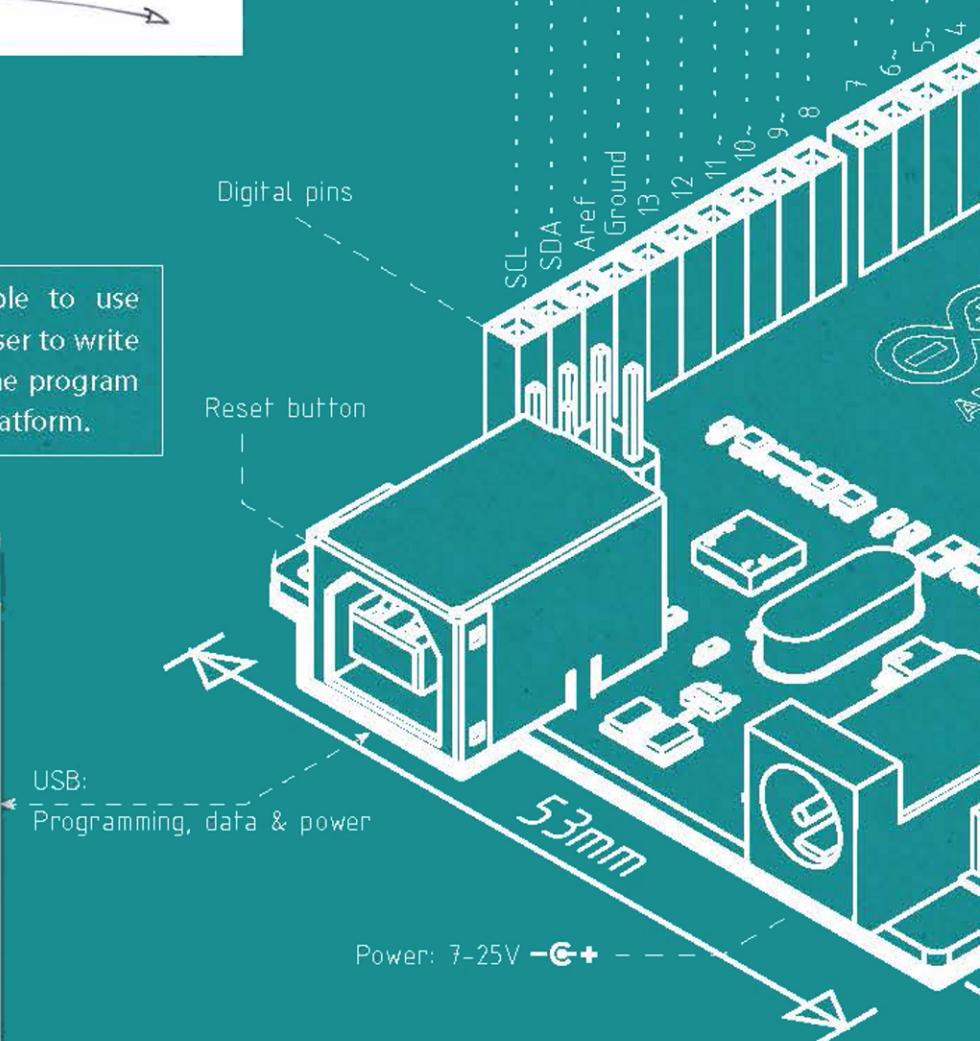
Software: The Arduino IDE is a simple to use programming environment. It allows a user to write code, to test & compile and to upload the program into the microcontroller on an Arduino platform.

```
Blink | Arduino 1.0.5
Blink
Blink
Turns on an LED on for one second, then off for one second, repeatedly.
This example code is in the public domain.

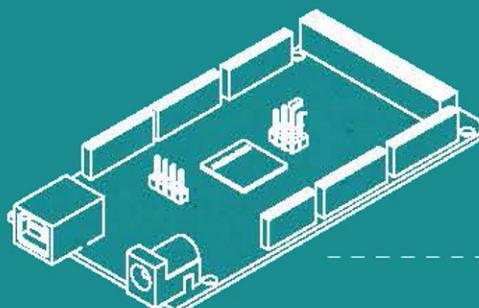
// Pin 13 has an LED connected in most Arduino boards.
// give it a name:
int led = 13;

// the setup routine runs once when you press reset:
void setup() {
  // initialize the digital pin as an output:
  pinMode(led, OUTPUT);
}

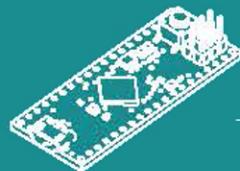
// the loop routine runs over and over again forever:
void loop() {
  digitalWrite(led, HIGH); // turn the LED on (HIGH is the voltage level)
  delay(1000); // wait for a second
  digitalWrite(led, LOW); // turn the LED off by making the voltage LOW
  delay(1000); // wait for a second
}
```



Arduino Open-Source Boards come in various forms, made by Arduino and others supporting the community.



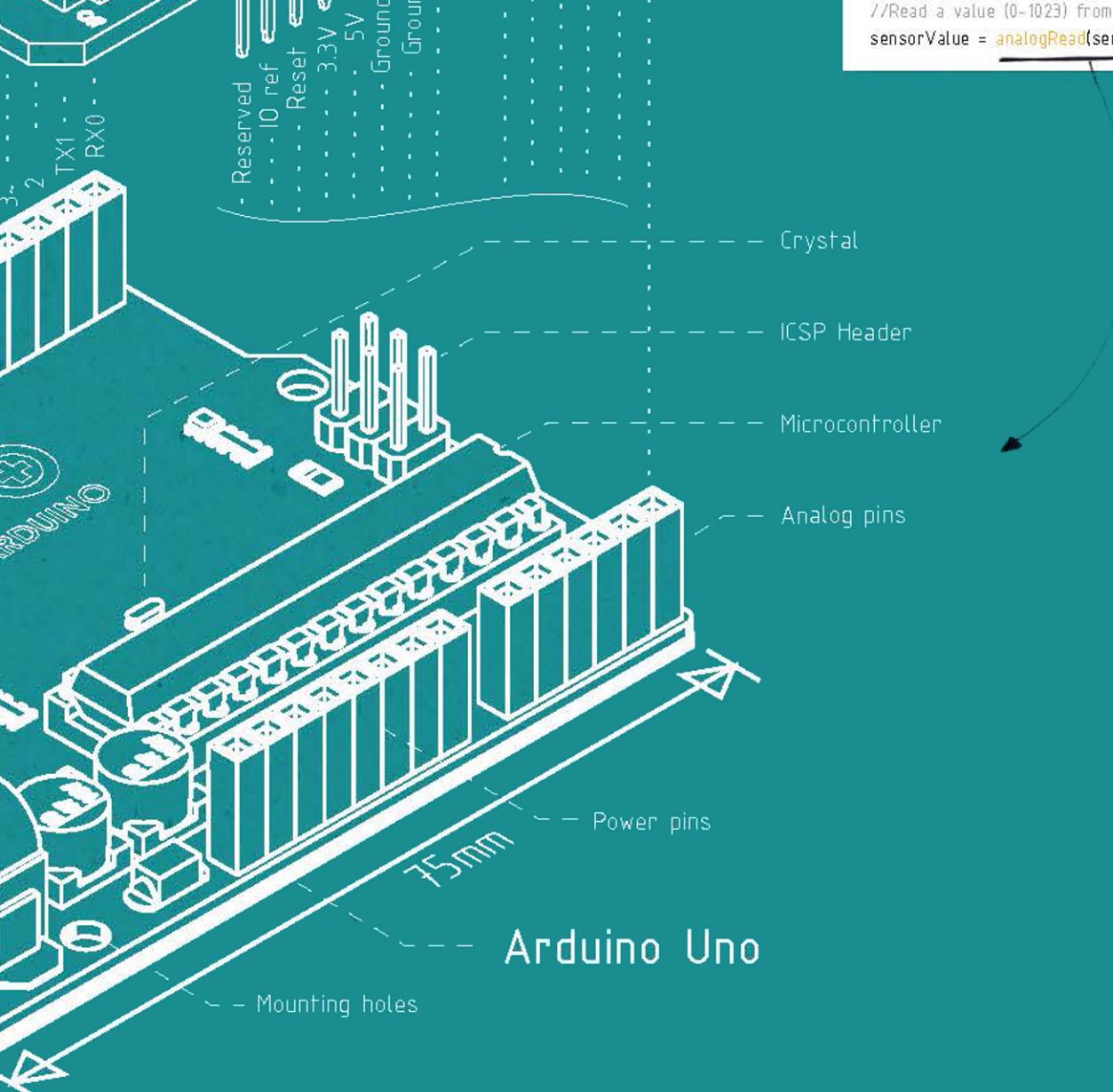
Arduino Mega 2560
More pins and speed



Arduino Micro
Smaller size

NEXTPROJE

People who are really serious about software



```
//Read a value (0-1023) from "sensorPin"
sensorValue = analogRead(sensorPin);
```



Arduino Lilypad
For wearable electronics

```
// Useful functions
+ - / *
delay(1000) // arithmetic
millis() // wait for one second (1000 milliseconds)
constrain(value, low, high) // returns the time since start
map(value, fromLow, fromHigh, toLow, toHigh) // constrains a value
Serial.begin(9600) // Re-maps a number from one range to another
Serial.print() // Opens a serial port with a 9600 baudrate
Serial.write() // Writes human-readable text to the serial port
Serial.read() // More advanced alternative
// Read one byte from the serial port
```

CREATE/SEEK

should make their own hardware—Alan Kay