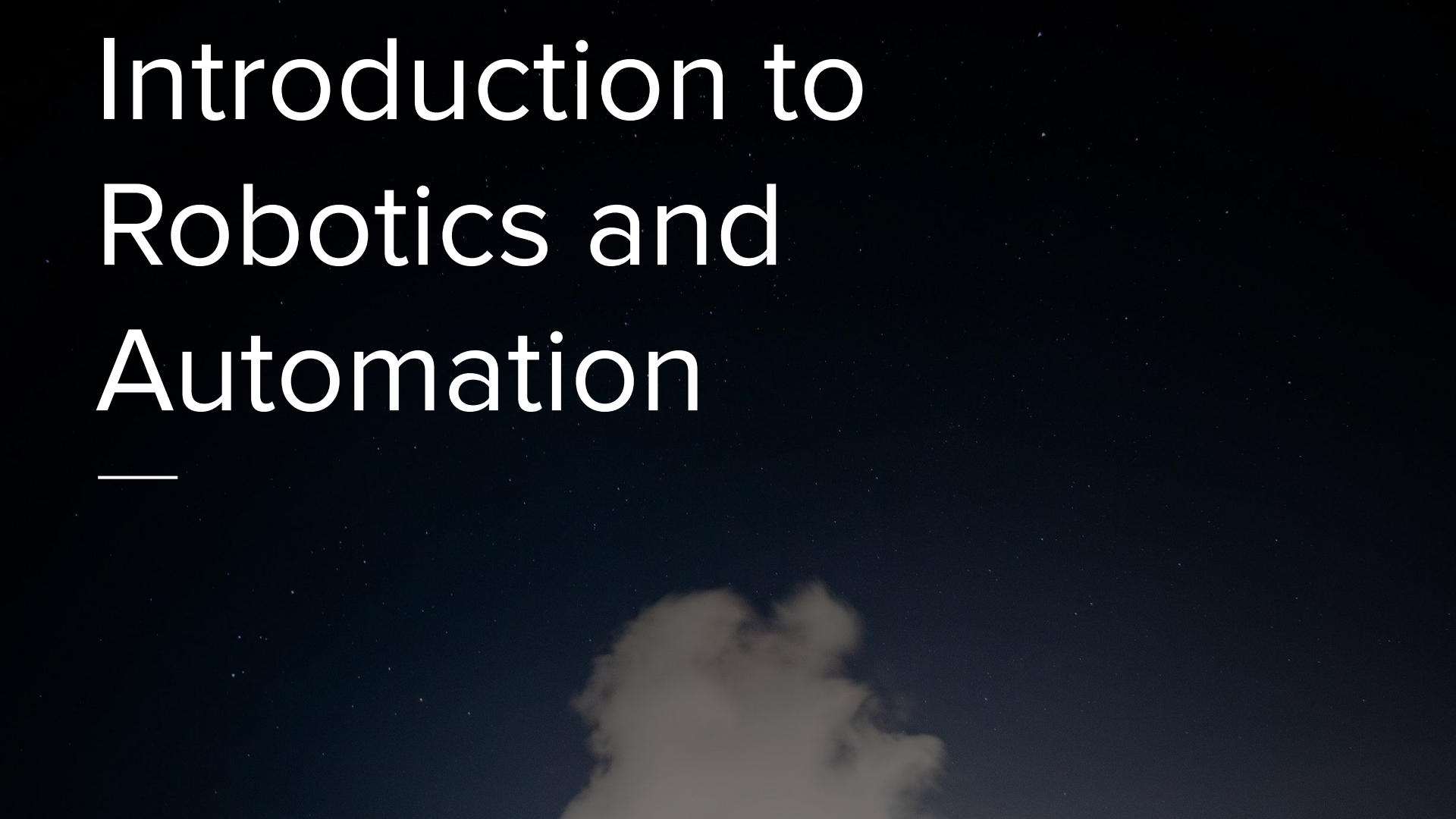
Introduction to Robotics and Automation



What is Automation ?

Getting things done -

- Automatically.
- Increased productivity.
- With consistency.
- And reliability.

Home Automation

What is Robotics ?

Automation that include Physically moving things.

Industrial Automation

ToDo

Fundamentals

Components

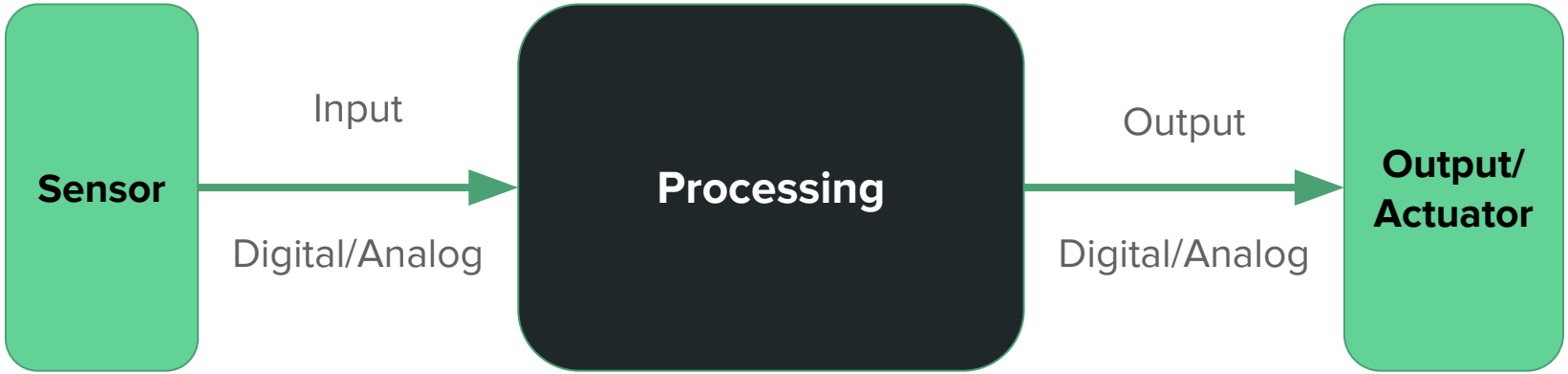
Programing Basics

Hands on Exercise

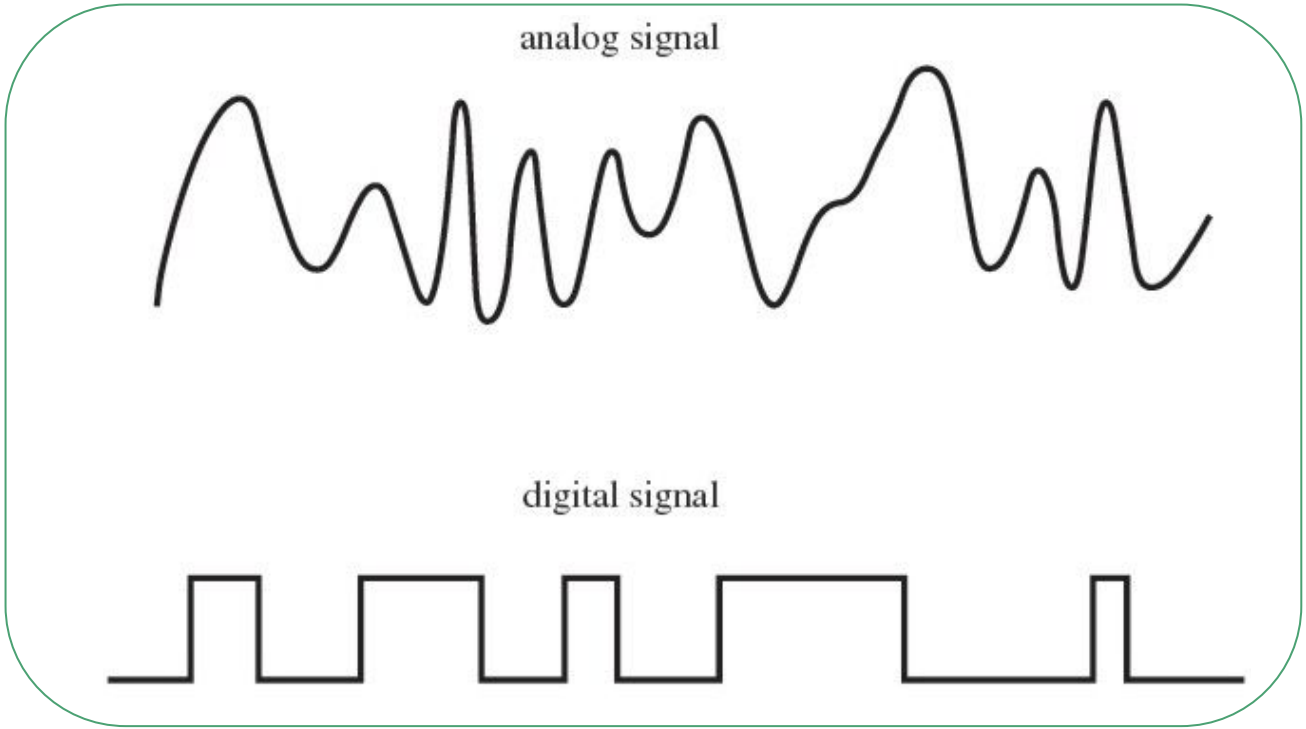
FUNDAMENTALS

What do you do in Robotics?

Basic Architecture



Analog Vs Digital



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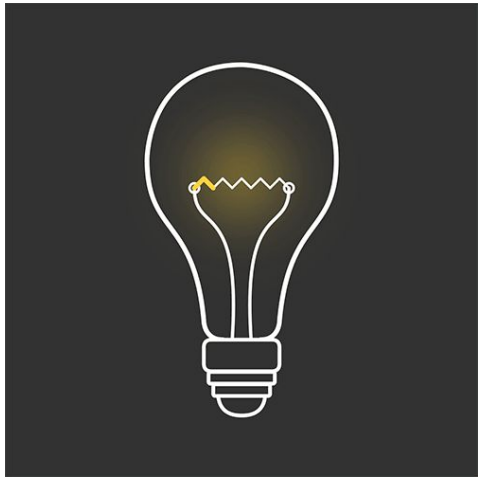
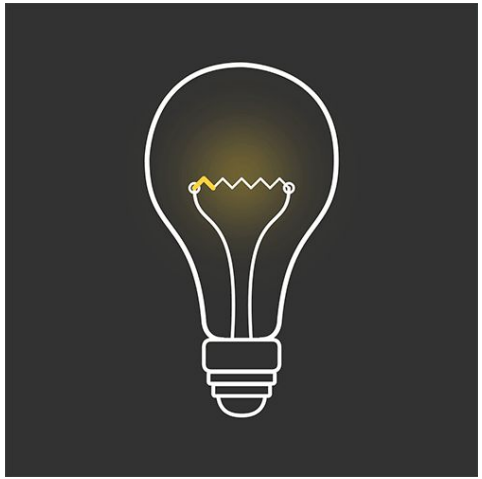


Analog

Digital

Analog



Analog

100%	220V
80%	200V
60%	150V
.	.
.	.
0%	0V

Digital

- On / Off
- Protocols
  - Serial
  - I2C
  - SPI
  - HTTP

Digital

Sensor

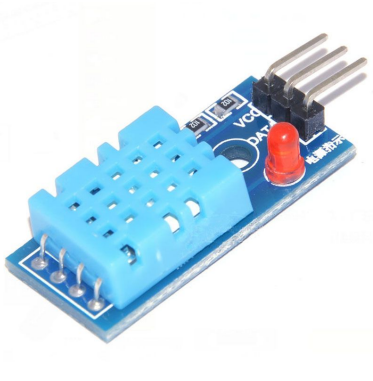
Measure Physical Entity and Convert it to Data (Digital/Analog)

- Switch
- Temperature
- Light
- Fire
- Touch
- Sound
- Radio Frequency

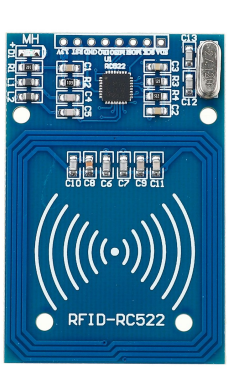
Sensors

Push Switch

Light Sensor (LDR)



Temperature & Humidity Sensor (DHT)



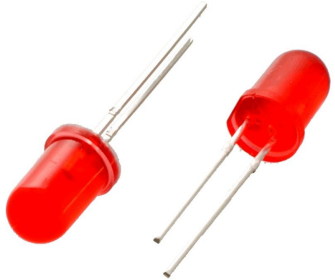
RFID Sensor

Output/Actuator

Do Physical work according to data (Digital/Analog)

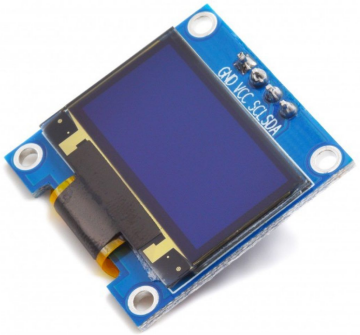
- LED
- Display
- Motor
- Sound
- Send Data (Wifi, GPRS,Bluetooth)

Output/Actuator



LED

Motor & Driver



Oled Display

Buzzer

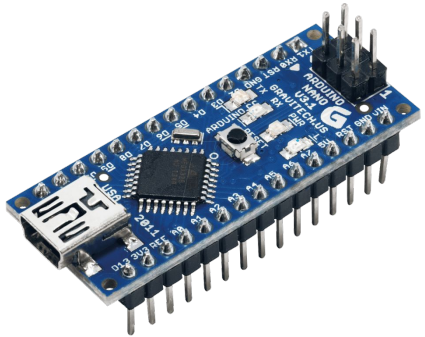
Processing

Take Input Signal
Process data
Provide Output Signal

- Microcontroller
- Computer

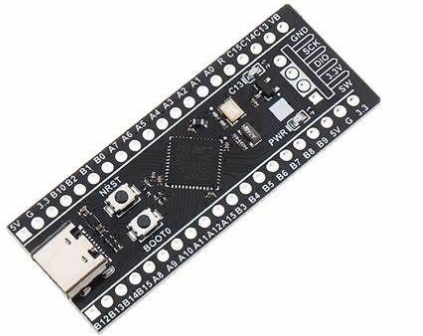
Processing (Microcontroller)

Arduino Uno



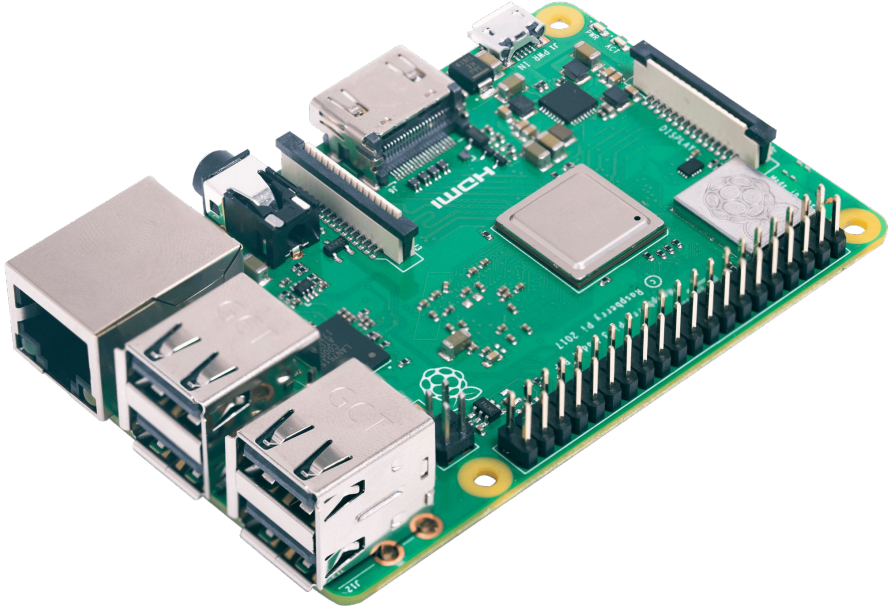
Arduino Nano

ESP-32



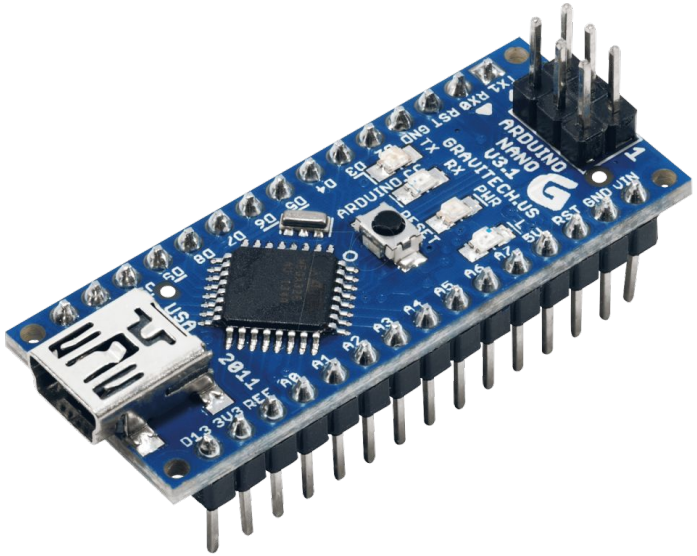
STM-32

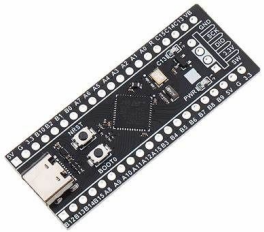
Processing (Computer)



Raspberry Pi

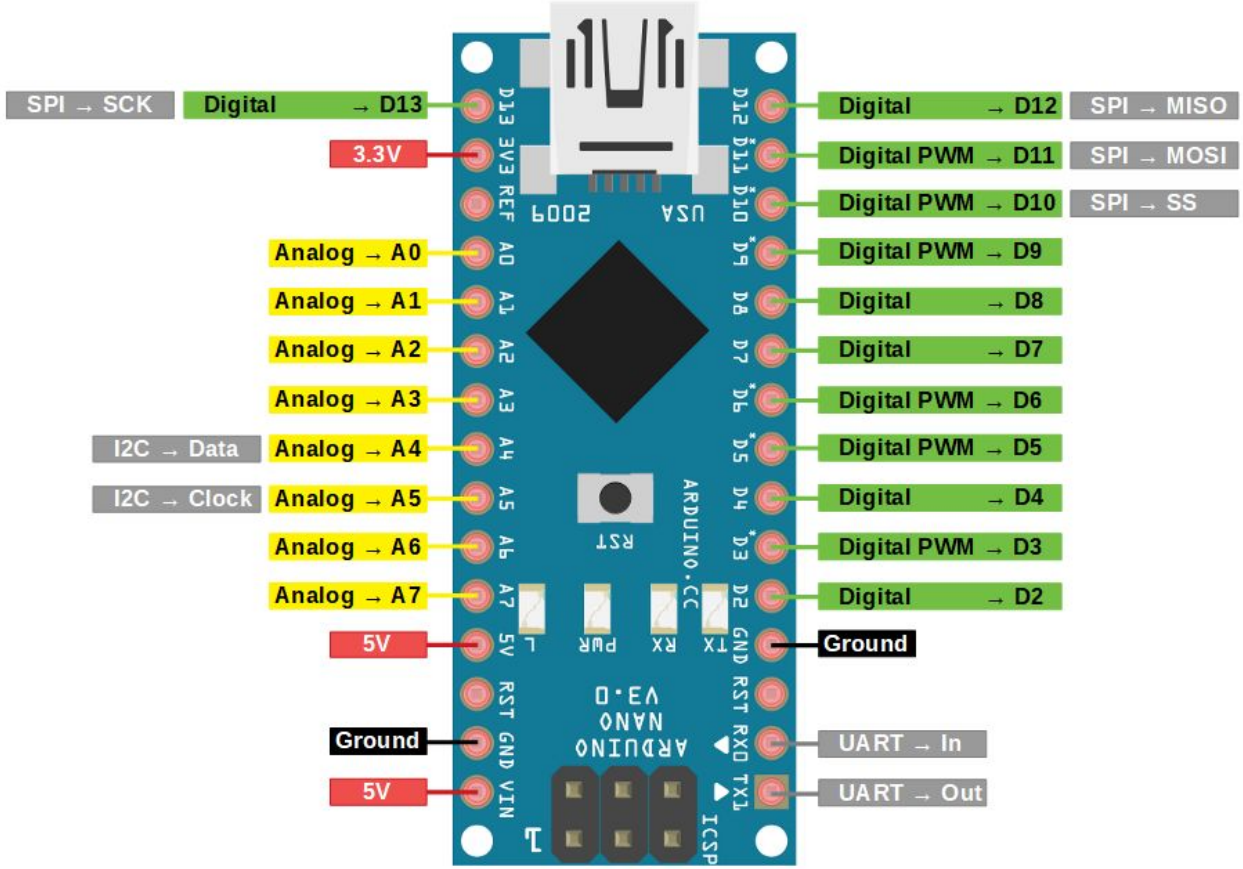
Nvidia Jetson Nano



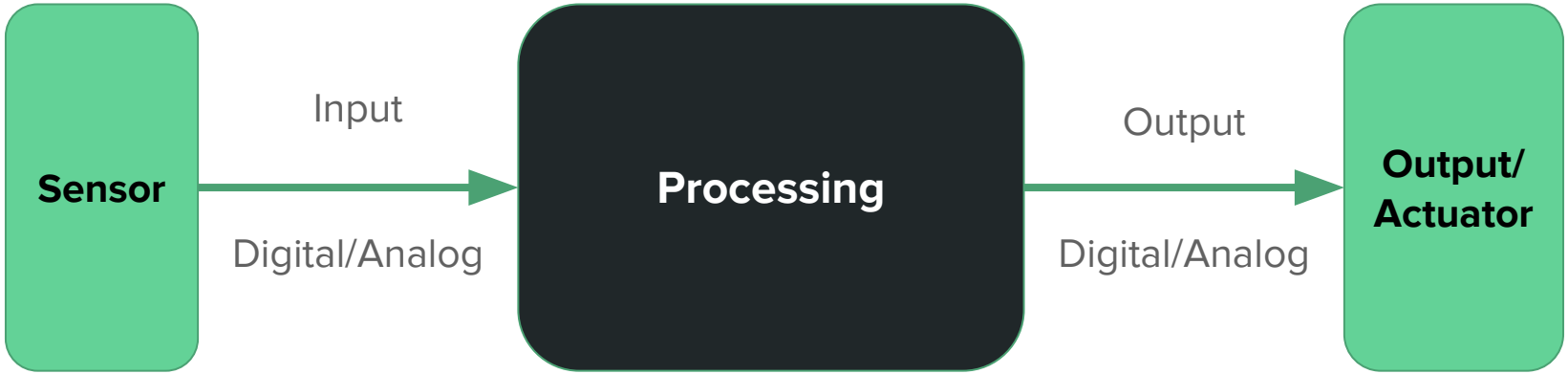


Microcontroller

Arduino Nano



Basic Architecture



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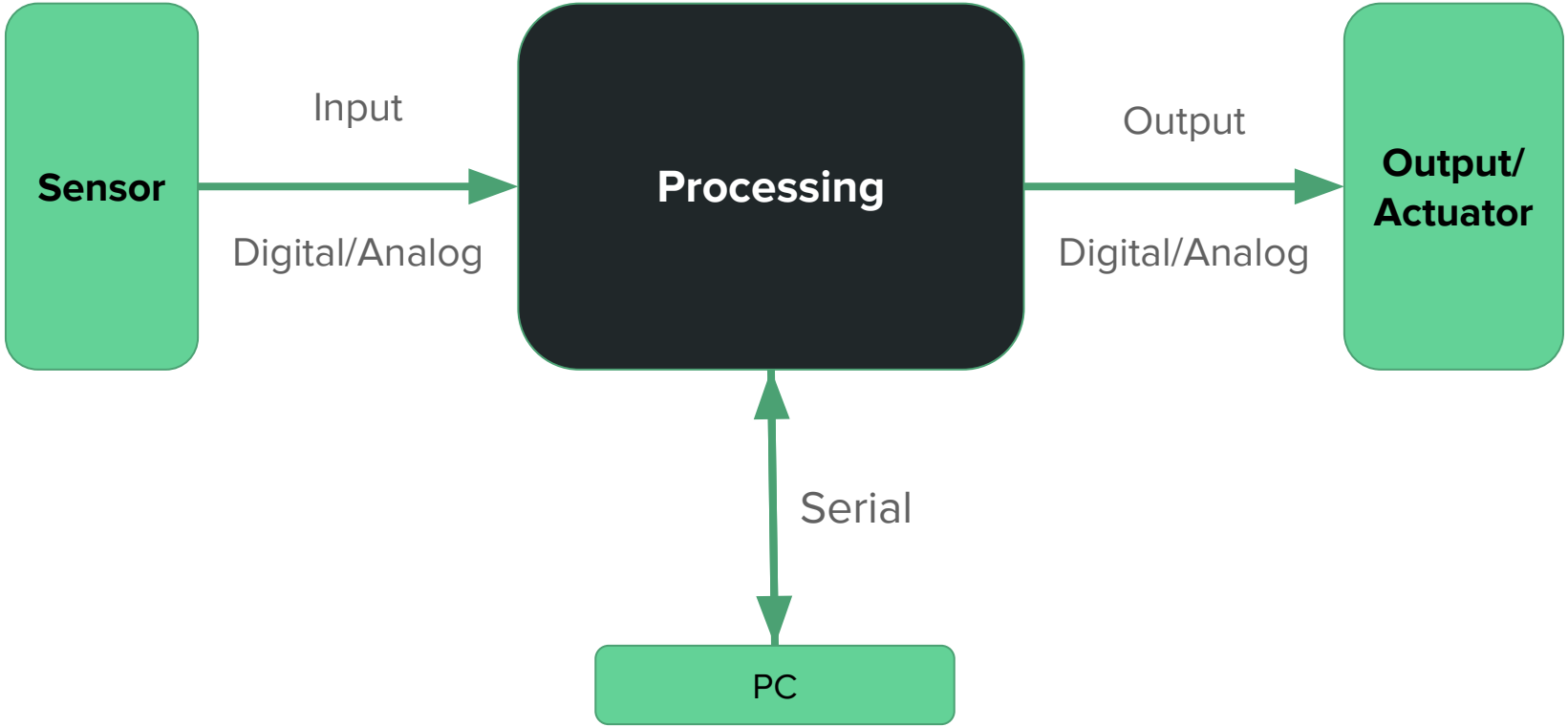
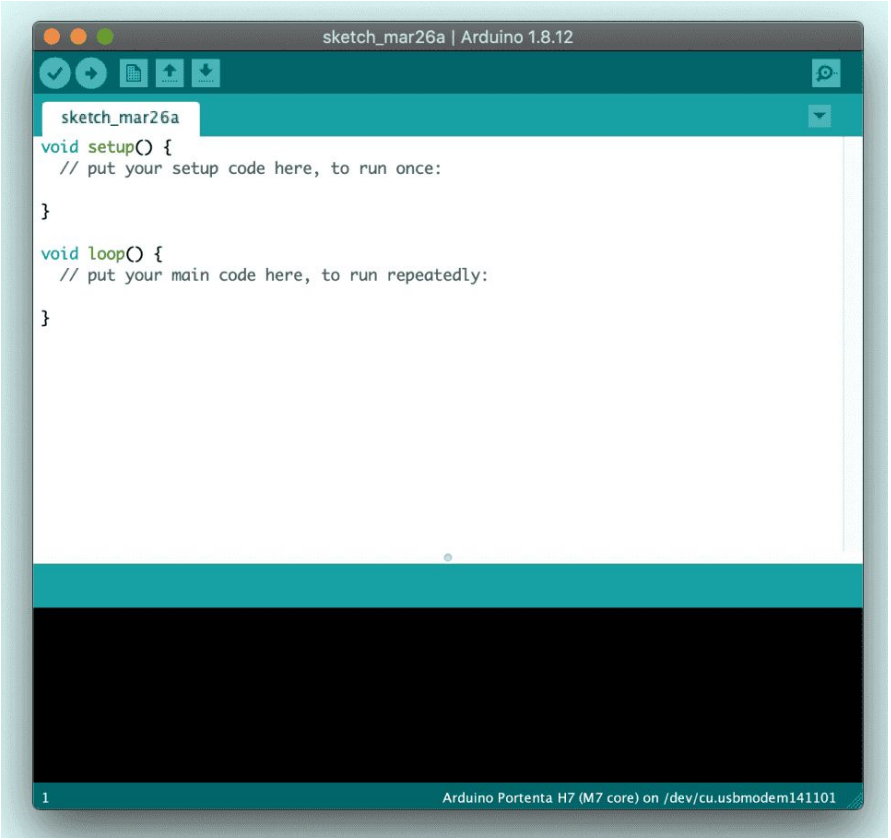
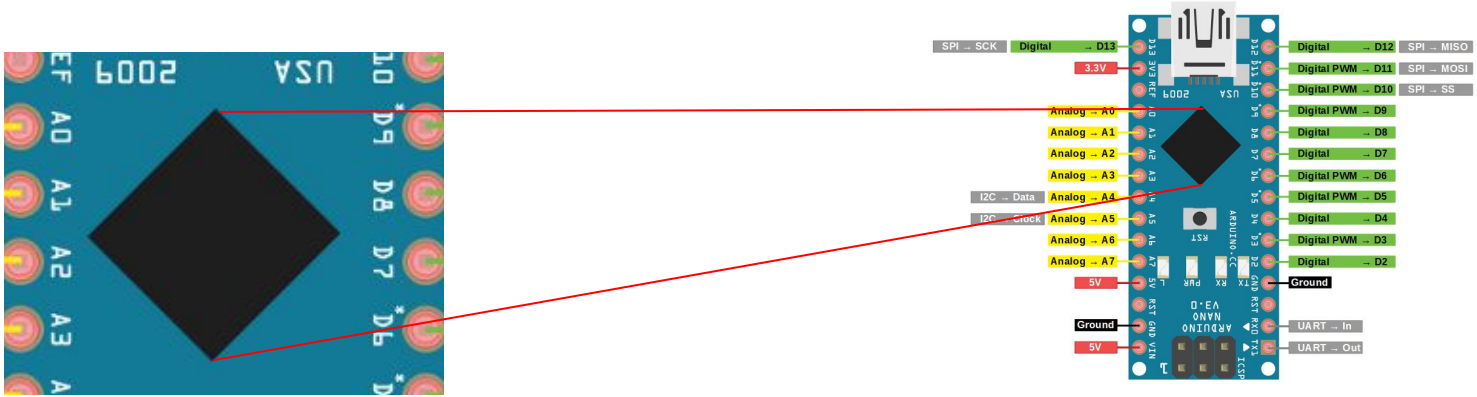


Programing

Arduino IDE



Arduino Echo System



Live Demo