

# Digital Ports

Embedded Software

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# Digital Ports (1)

- Basics

- Direction of pins

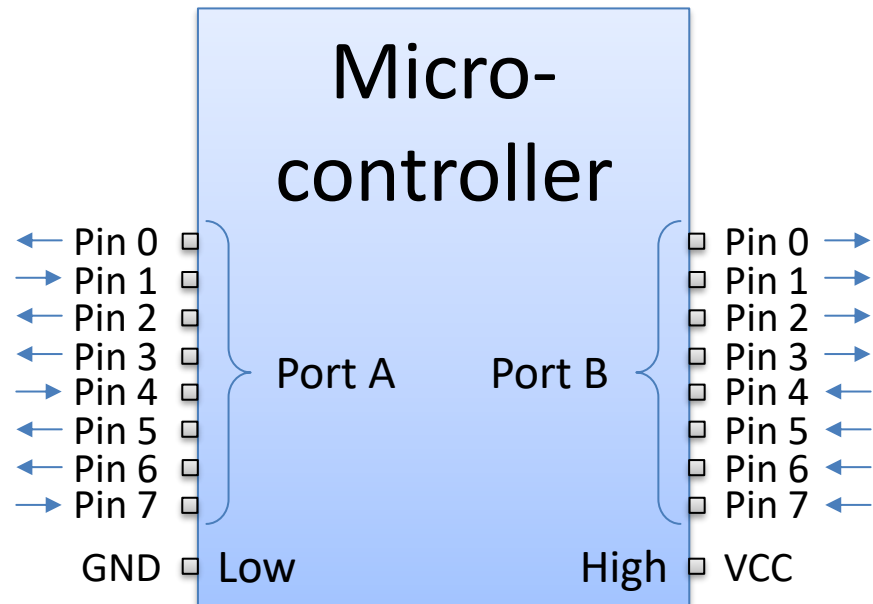
- Input
- Output

- State of pins

- 1: High (VCC)
- 0: Low (GND)

- Group of pins

- Ports

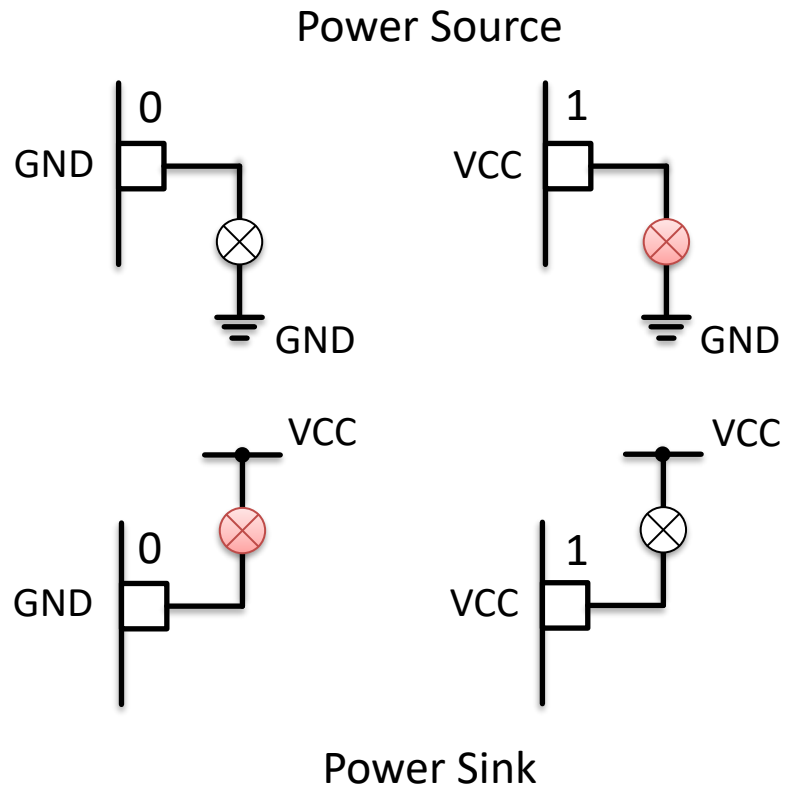


# Digital Ports (2)

- Output Pins

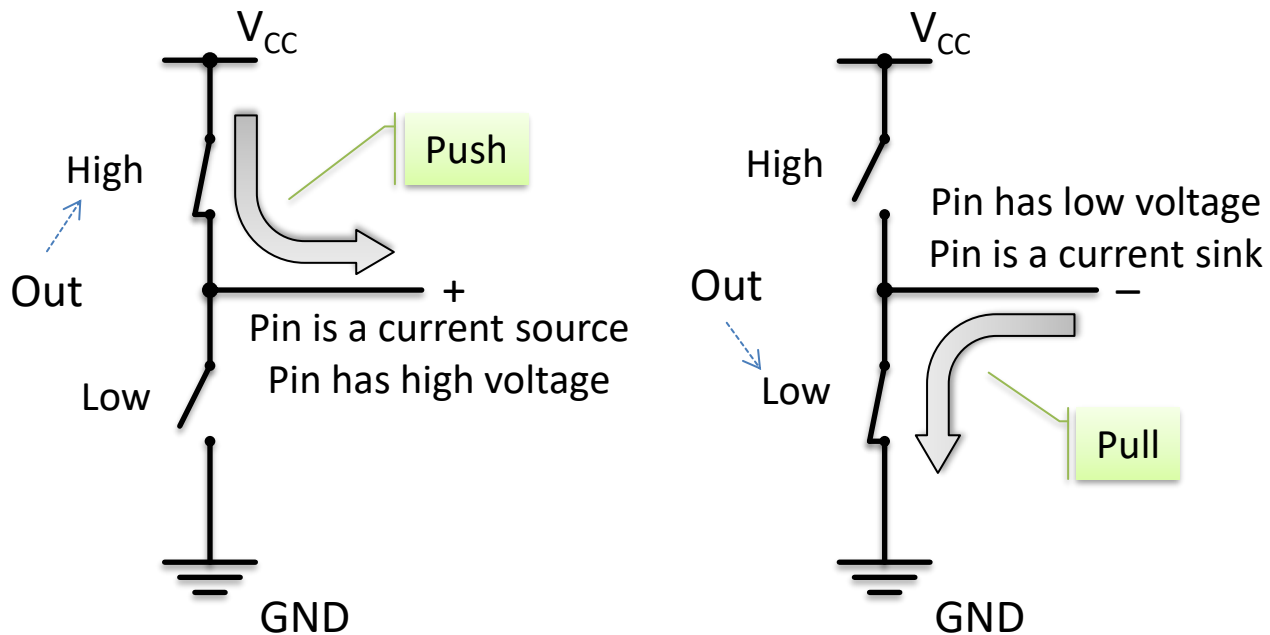
- Power sources

- High
      - Positive pole
      - Source
    - Low
      - Negative pole
      - Sink



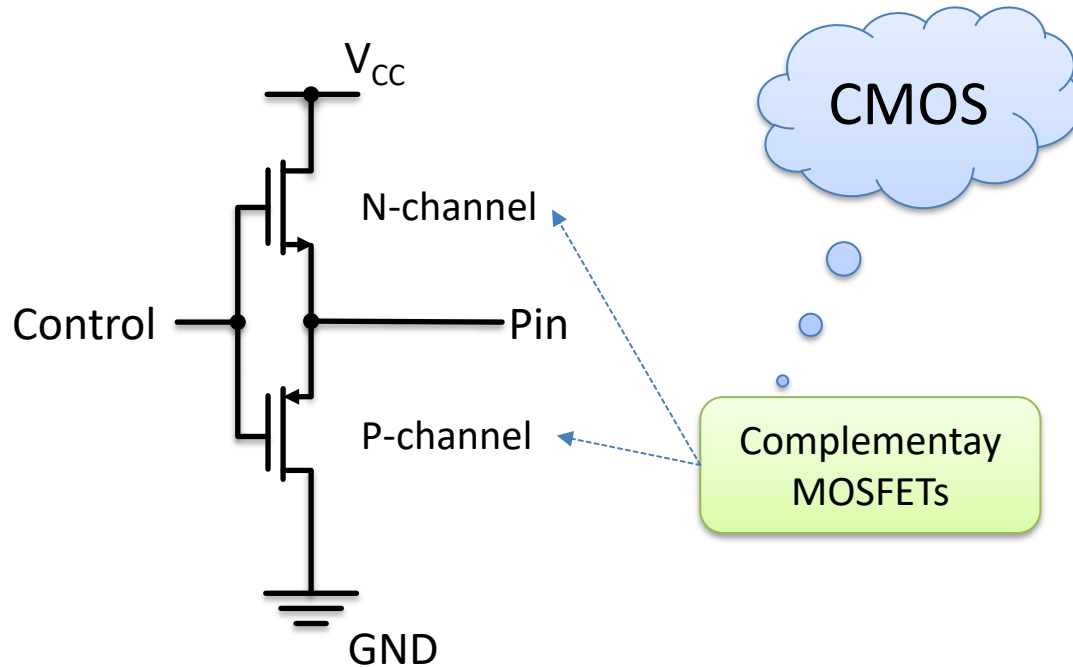
# Digital Ports (3)

- Output Pins (continued)
  - Push–pull output



# Digital Ports (4)

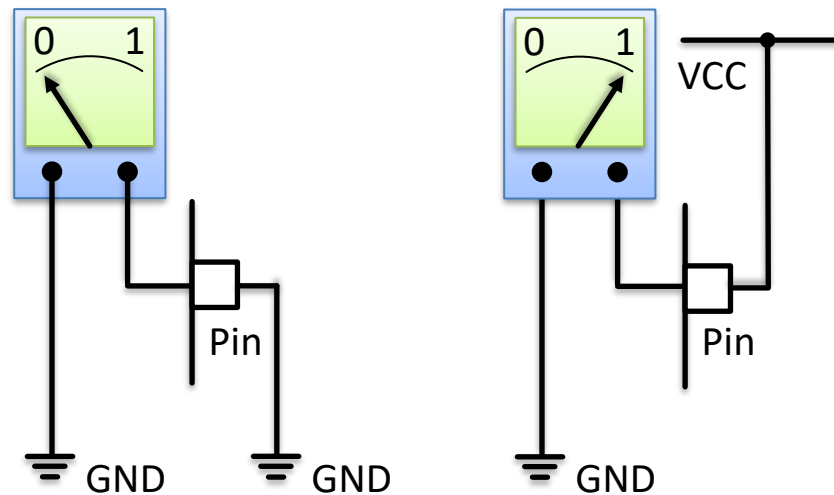
- Output Pins (finished)
  - Technical Implementation



# Digital Ports (5)

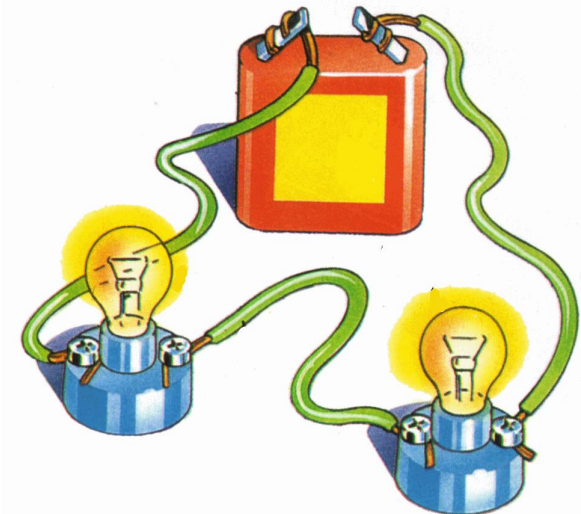
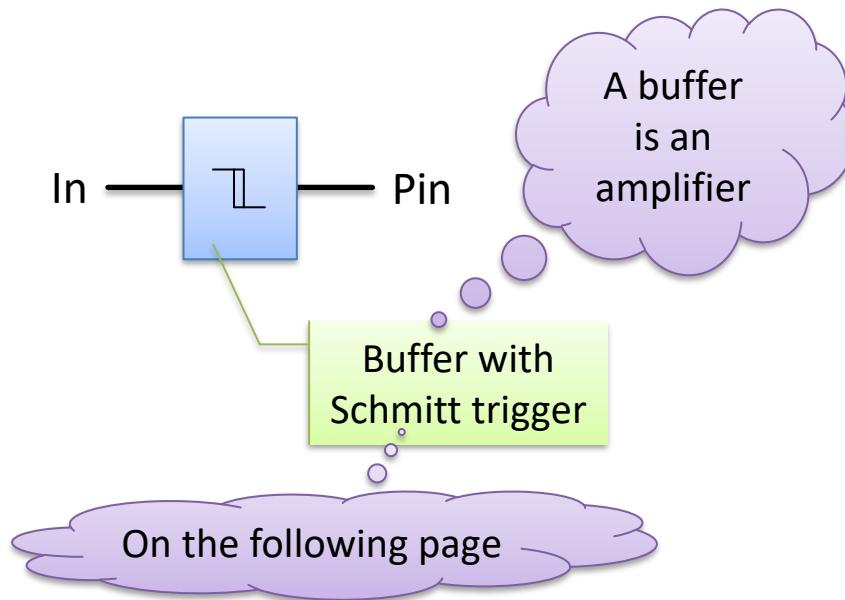
- Input pins
  - Probes
    - Voltmeter
    - GND → 0
    - VCC → 1
  - No current

Voltage Probe



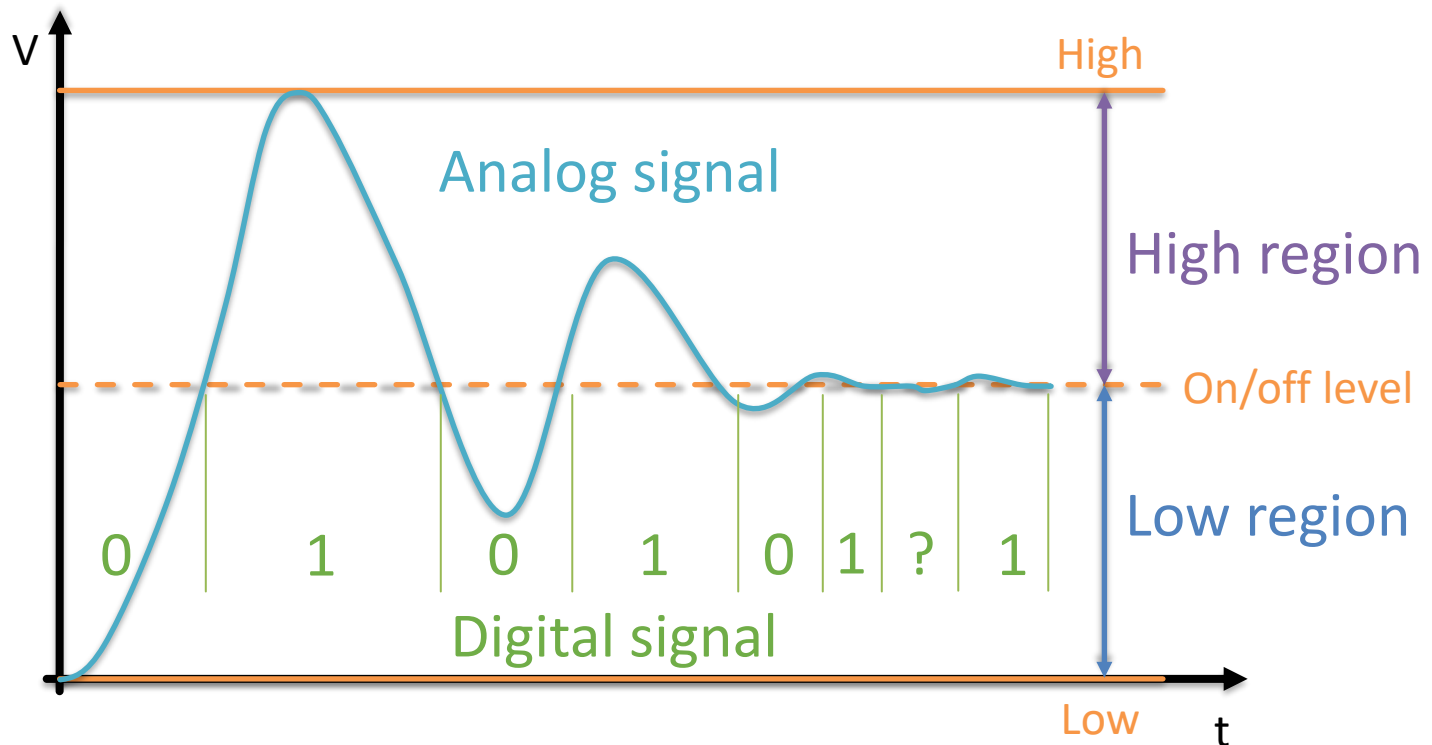
# Digital Ports (6)

- Input pins (continued)
  - Technical Implementation



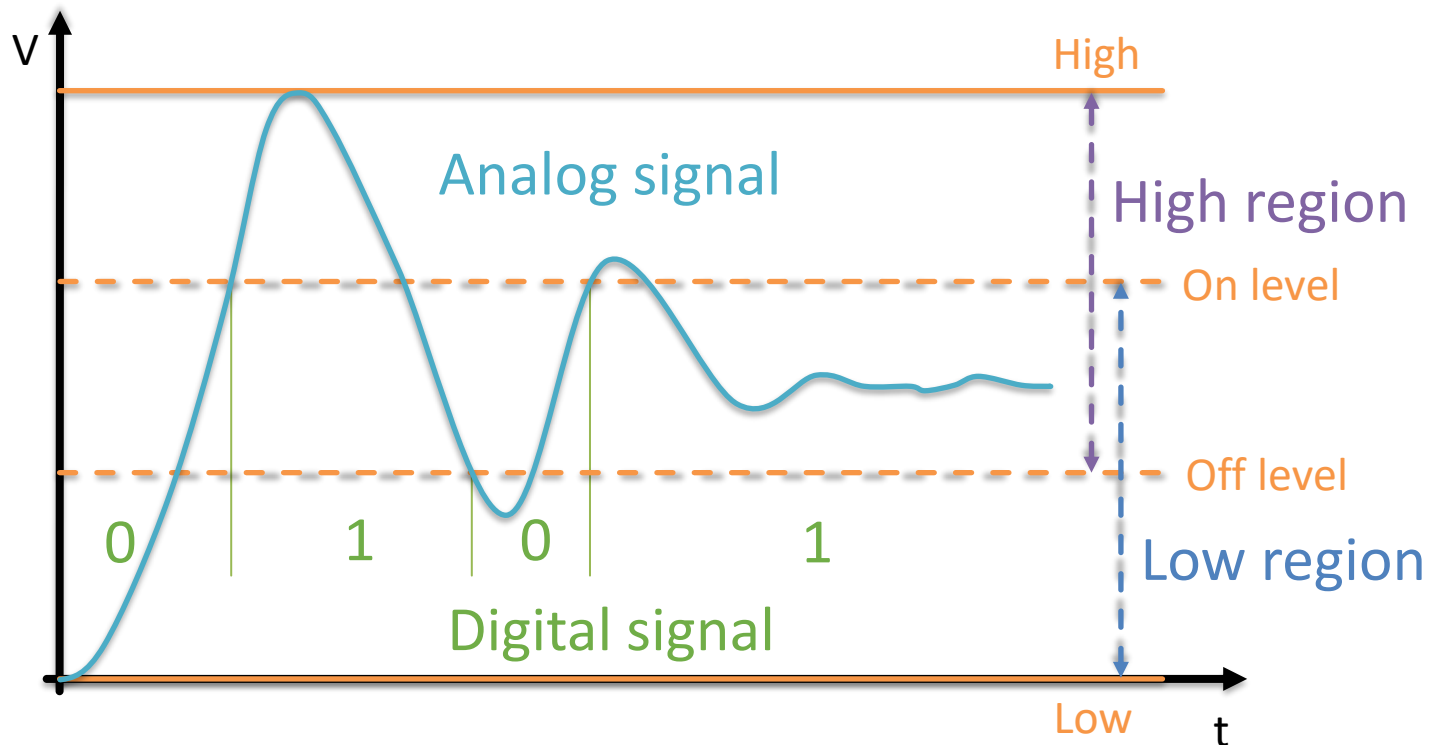
# Digital Ports (7)

- Input pins (continued)
  - Without Schmitt trigger



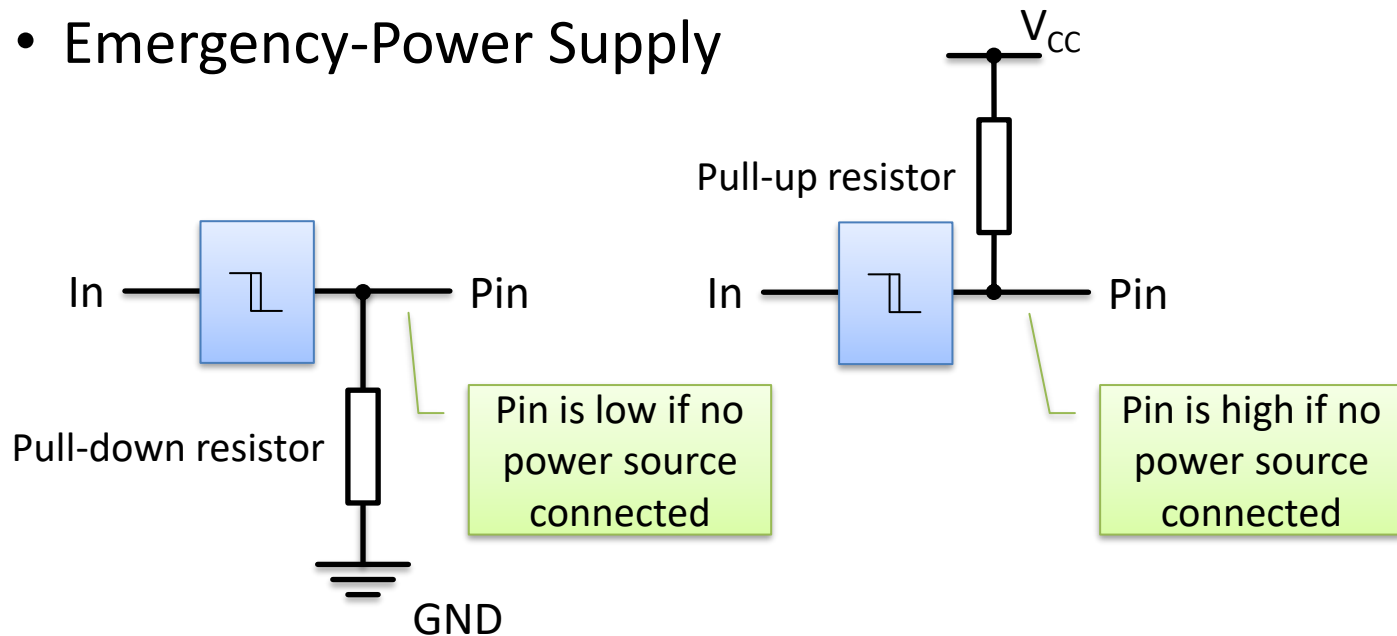
# Digital Ports (8)

- Input pins (continued)
  - With Schmitt trigger



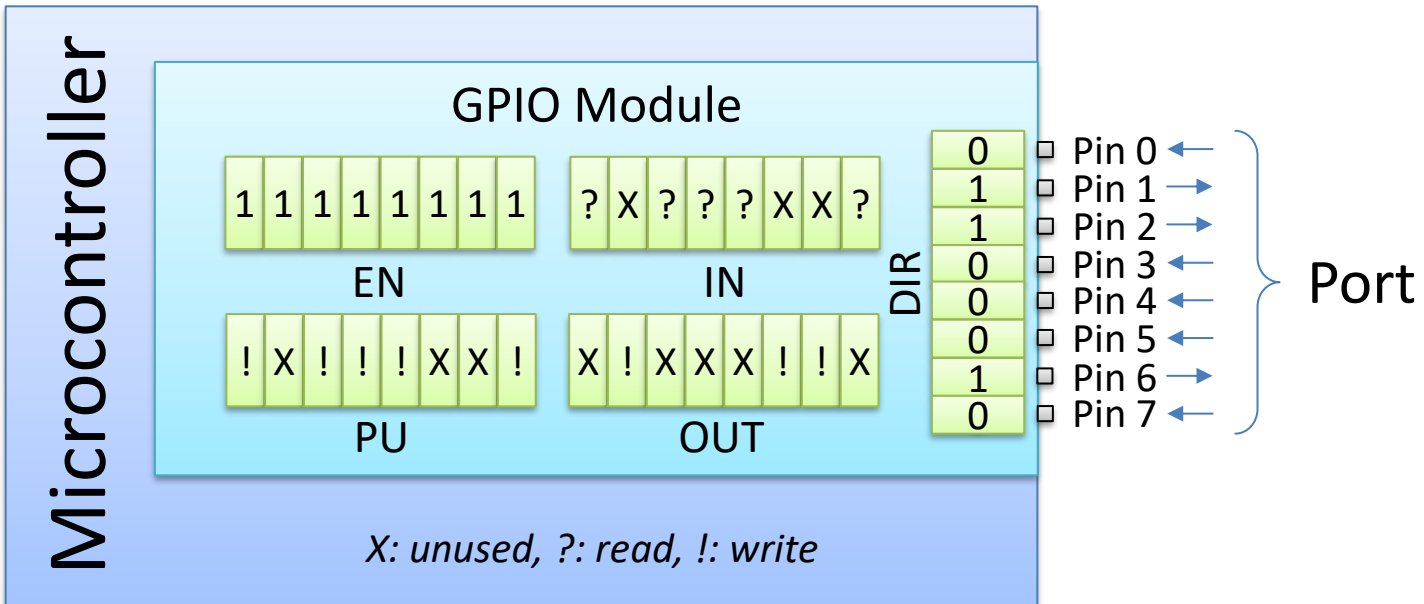
# Digital Ports (9)

- Input pins (finished)
  - Pull Configuration
    - Emergency-Power Supply



# Digital Ports (10)

- GPIO Module



# Digital Ports (11)

- Electrical Characteristics
  - Operating voltage
    - Typ. 3.3 V / 5.0 V
  - Max pin current
    - Typ. 20.0 mA
  - Consult Datasheet

