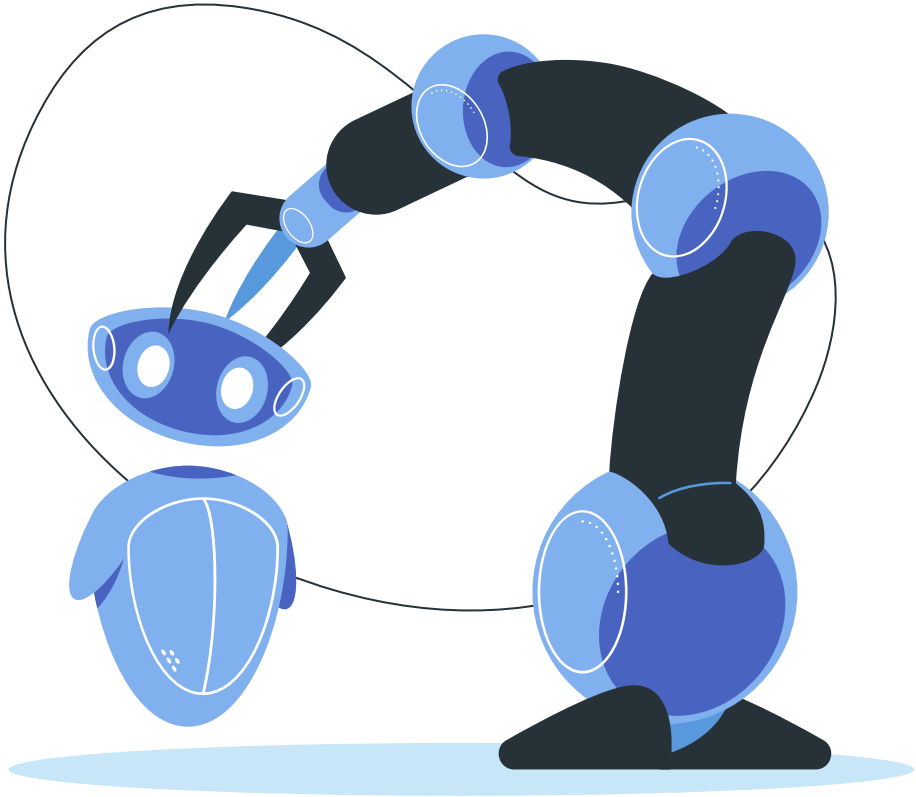
Robotics Workshop

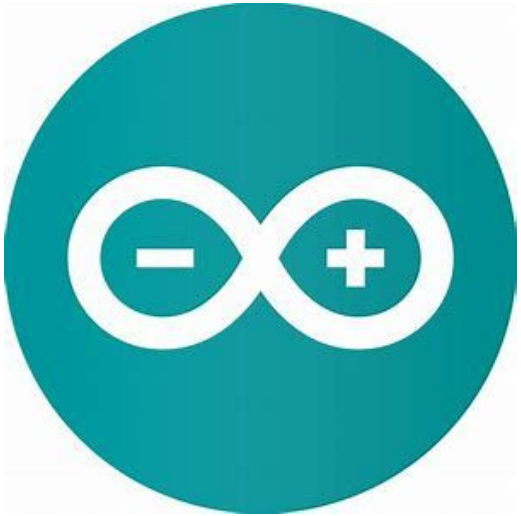
KTP Fall 2024



Download ArduinoIDE

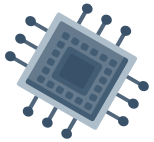
Please get into groups of **2-3 people**

Every group needs **at least one person** to install ArduinoIDE on their laptop!



Plan for Workshop

1. Intro to Arduino
2. Wiring!
3. Basic Code
4. Time to Experiment!

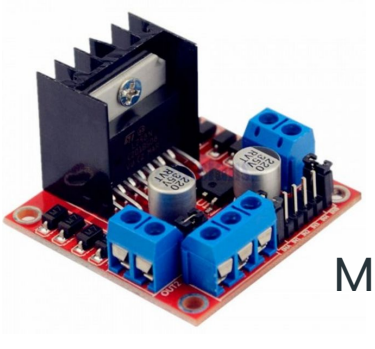


Components

Arduino Board

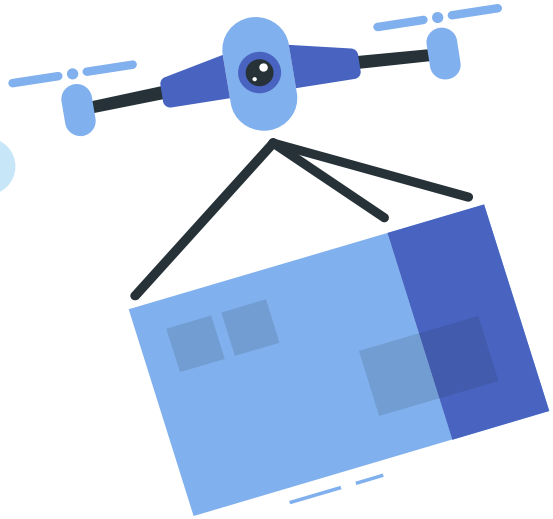
Gearbox Motor and Wheel

Jumper Wires



Motor Driver

Why Arduino?



Software

IDE **free**, easy to use, lots of examples

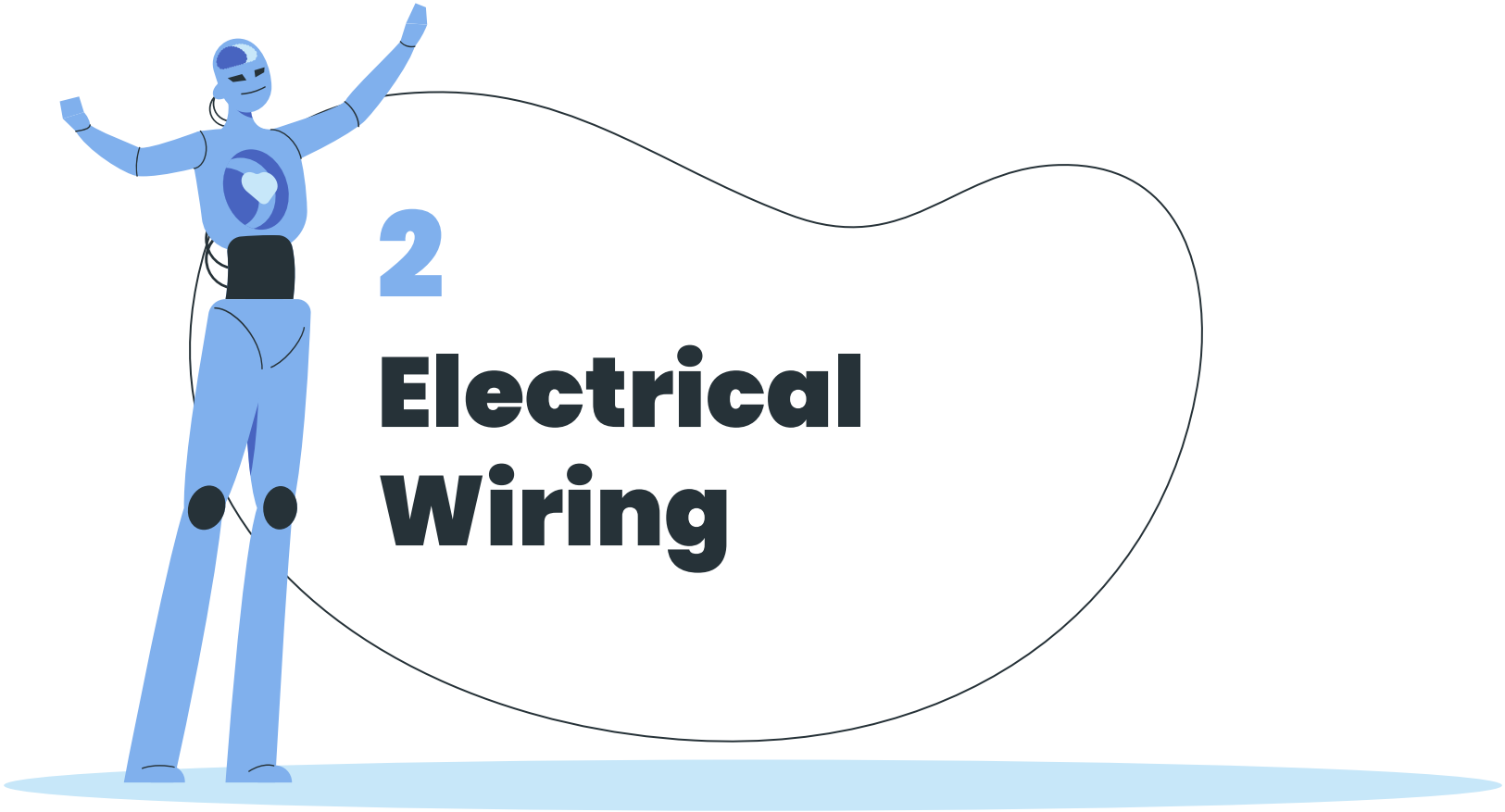
Based on C/C++

Hardware

Boards relatively **cheap** and easy to install

Versatile and compatible with variety of components

Easy to learn and applicable to wide range of uses



2
Electrical Wiring

IMPORTANT

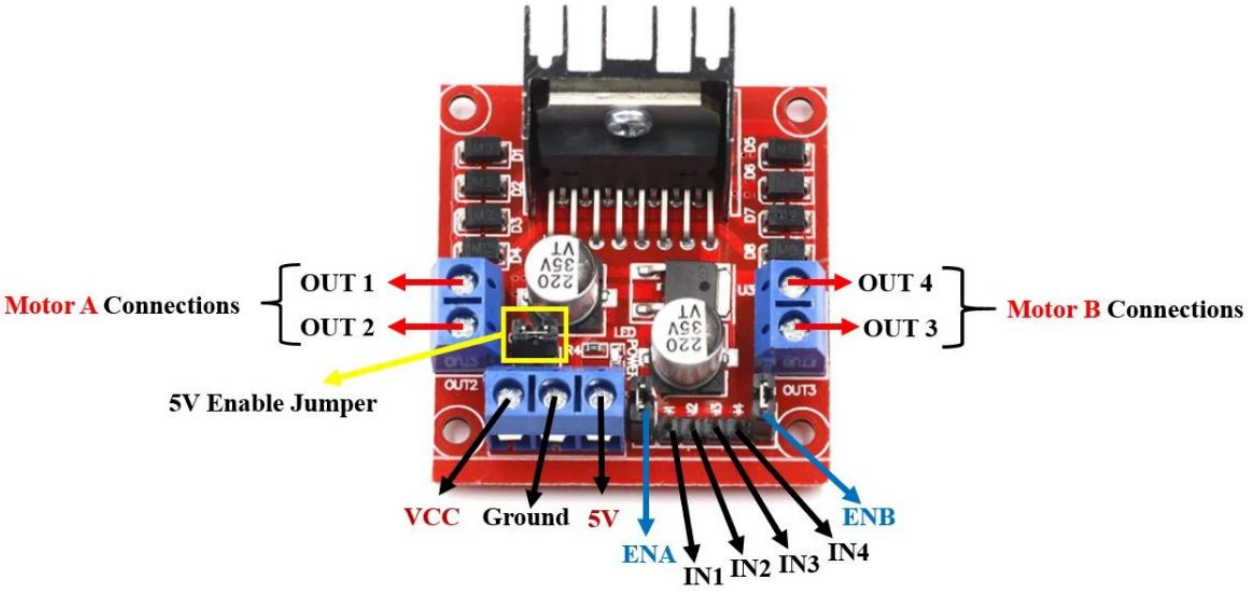
IT IS POSSIBLE TO BLOW UP/SET COMPONENTS ON FIRE WHILE WIRING - PLEASE **DON'T**

ALWAYS ALWAYS ALWAYS

- **Test** your wiring diagram using TinkerCad (or similar) before attempting in real life
- **Double check** your wiring before you add power!
  - Feel free to ask me or Nikki to come check yours at any point :)
- **Unplug** your wires if you smell smoke

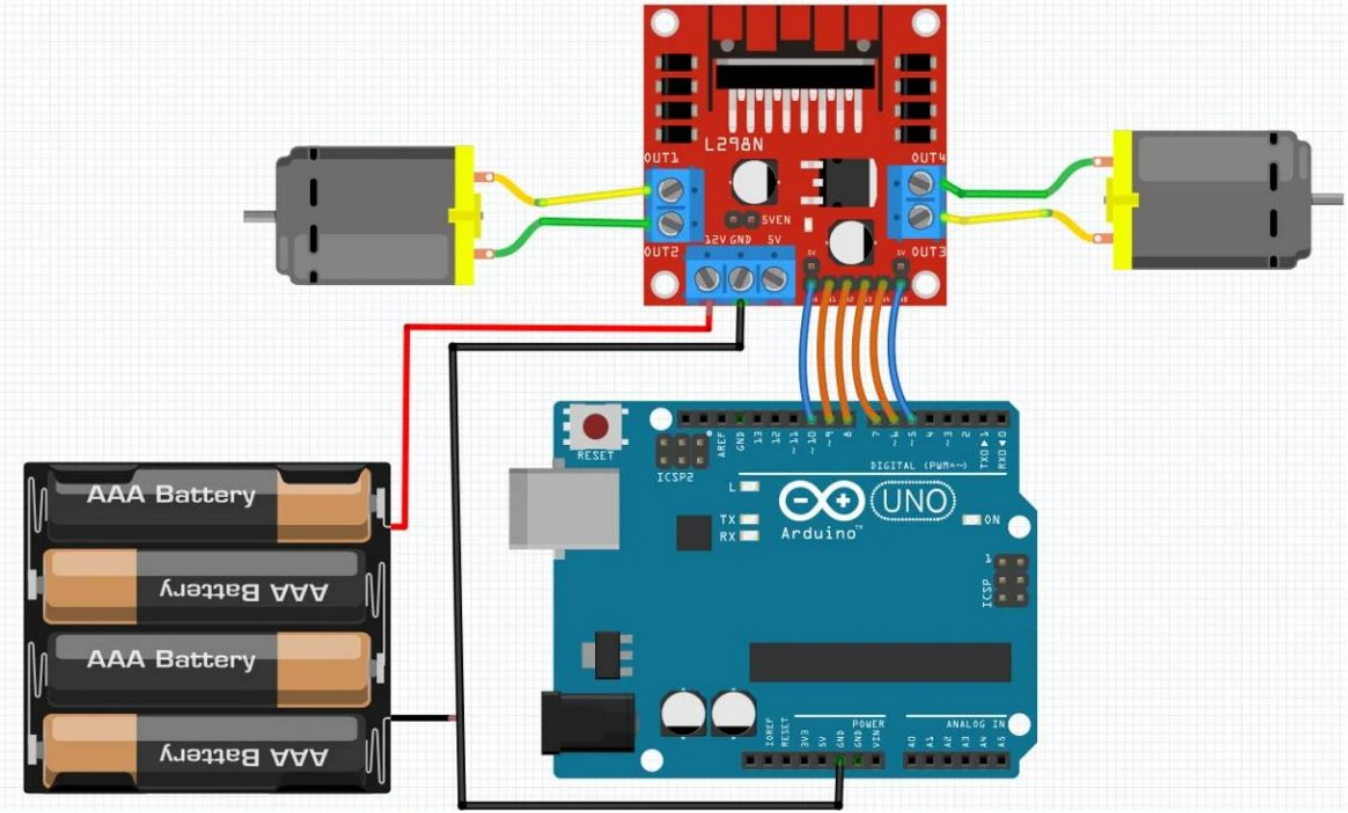
WHEN IN DOUBT - **ASK**

Wiring Explanation



**Female to male vs male to male wires - there's a difference!

With Wires

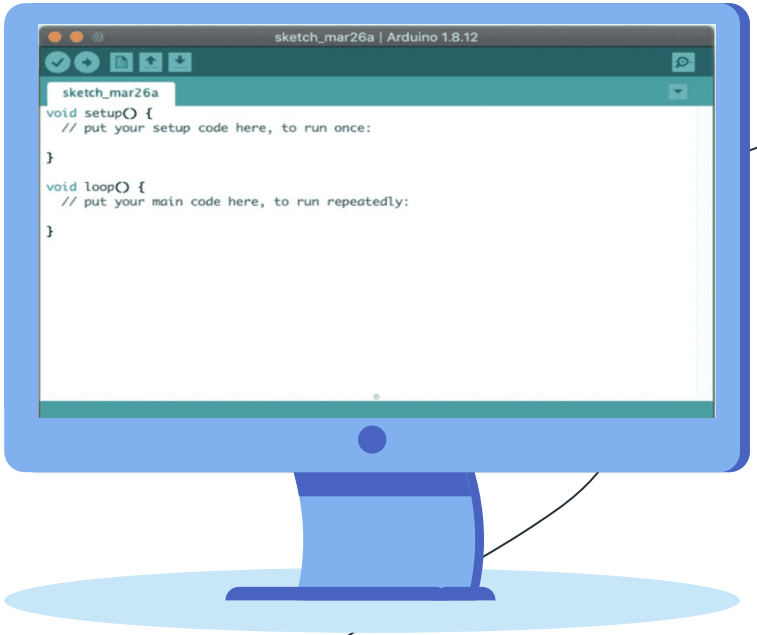

L298N
OUT1
OUT2
OUT3
OUT4
SVEN
12V GND 5V
AAA Battery
AAA Battery
AAA Battery
AAA Battery
RESET
ICSP2
UNO
Arduino
ON
TX
RX
DIGITAL (PWM~)
POWER
ANALOG IN

3

Coding!

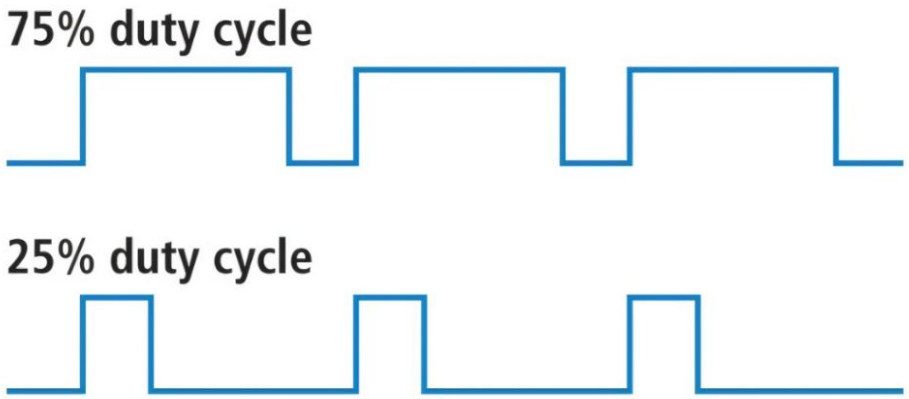
Arduino IDE

- Add/connect boards and ports
- **digitalWrite()**
- Forward and backward

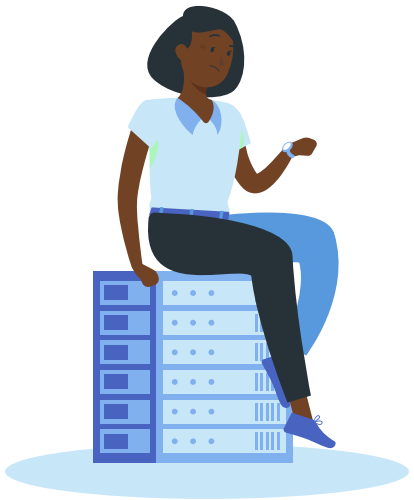


Pulse Width Modulation

- More commonly known as PWM
- **on/off**, so no inbetween - different from analog which has ranges
- Called **duty cycles**, often described via graph
- Higher PWM/duty cycle -> more time “On” -> faster



Code Pointers

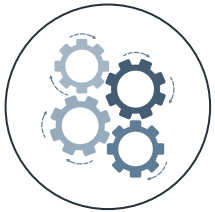


- Double check there is a “**;**” at the end of (almost) every line
- **Capitalizations!!!**
- Spacing and formatting matters
- Check your spelling

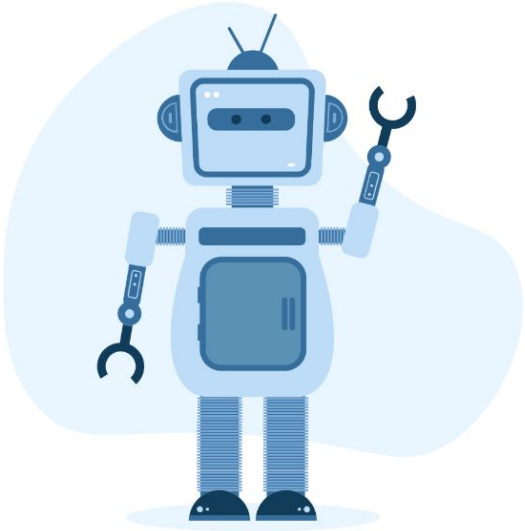
What Did We Learn?

Basic wiring techniques and safety

PWM and digitalWrite



Motor Control via Arduino



Thanks!

Let us know if you have any questions :)