

ADVANCED EV3 PROGRAMMING LESSON



EV3 Classroom: Daisy-chaining

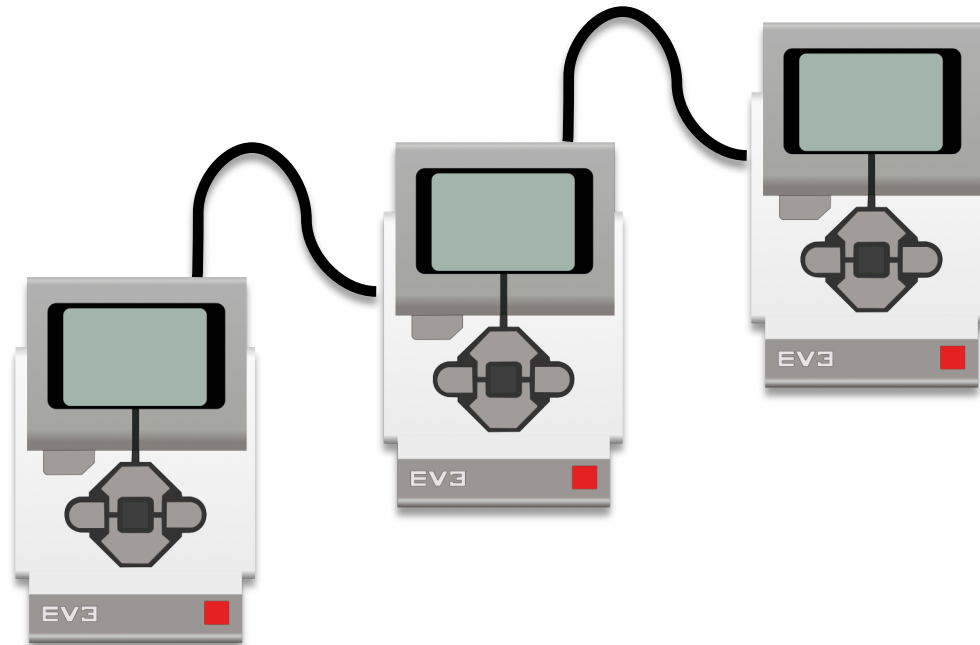
By David Lechner



EV3 CLASSROOM LESSON
BY EV3LESSONS.COM

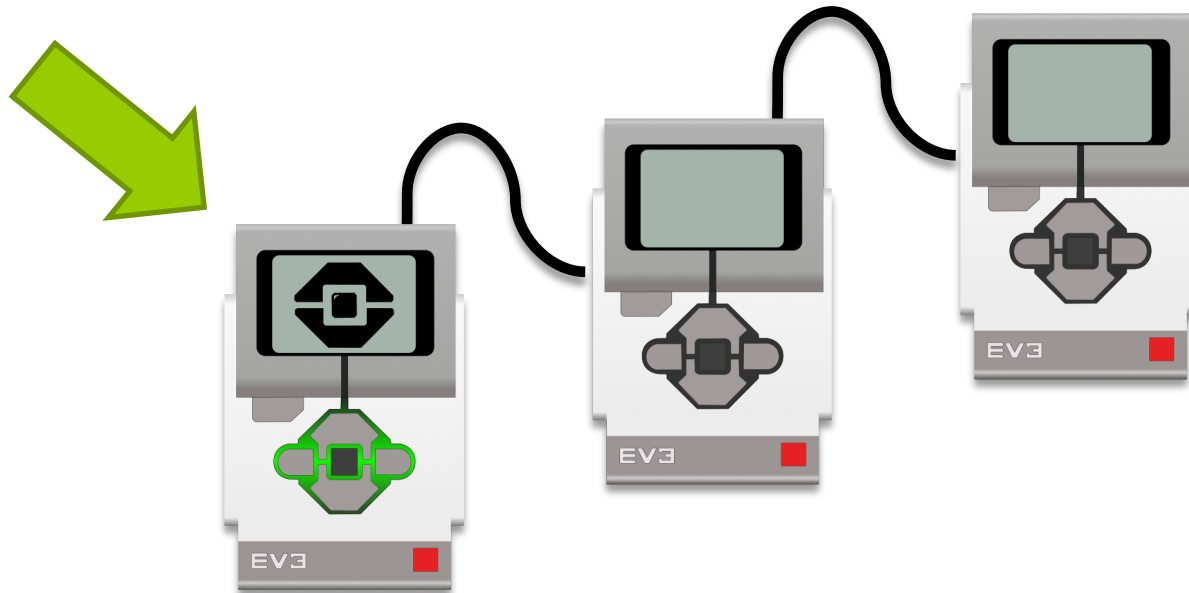
Lesson Objectives

- Learn how to daisy-chain multiple EV3 bricks using USB cables
- Learn how to write a program using daisy-chaining



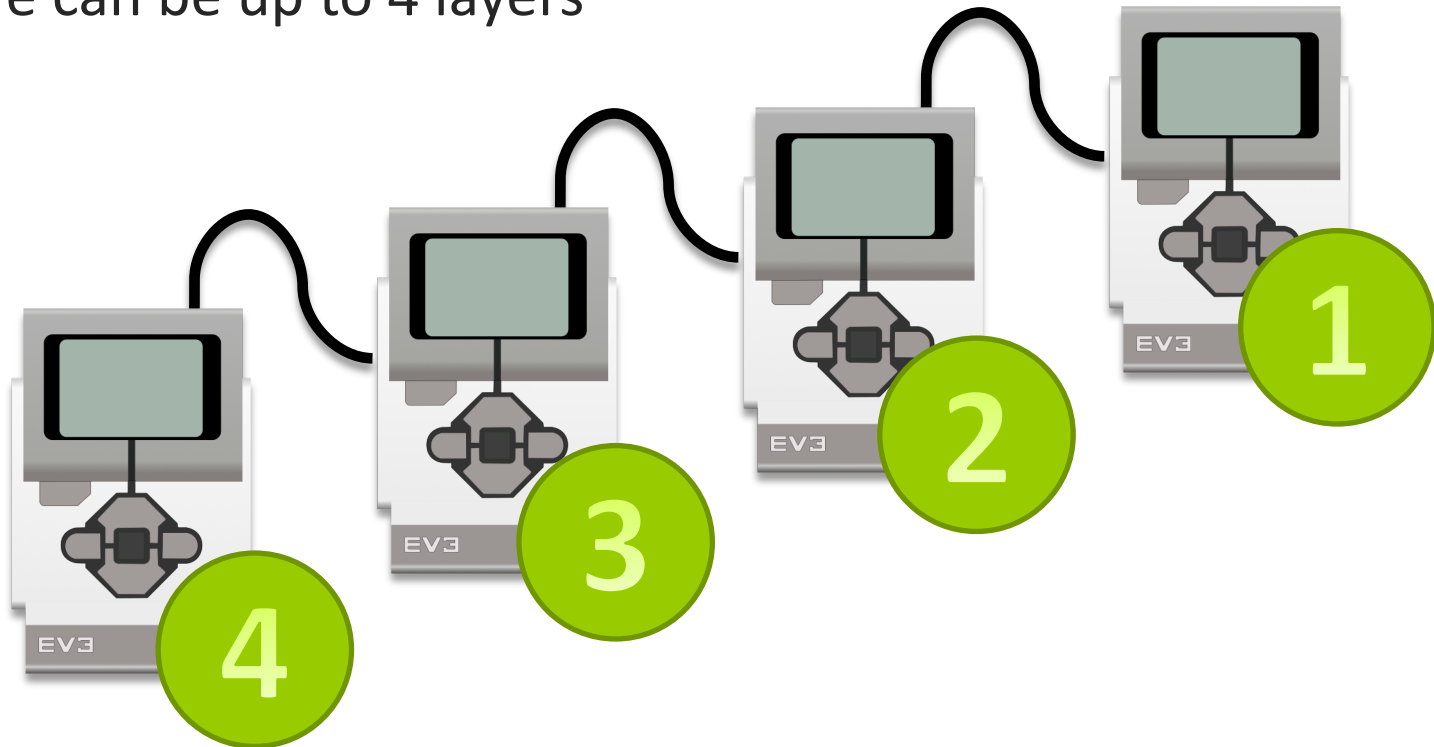
Connecting the EV3s

- The side USB port gets connected to the top USB port on the next EV3 in the chain
- Make sure to power on the last EV3 in the chain first



Layers

- Each EV3 in the chain has a “layer” number
- There can be up to 4 layers

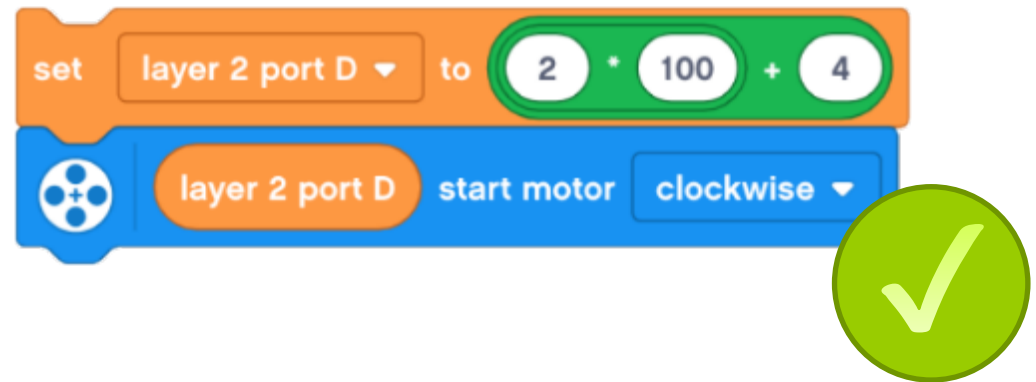
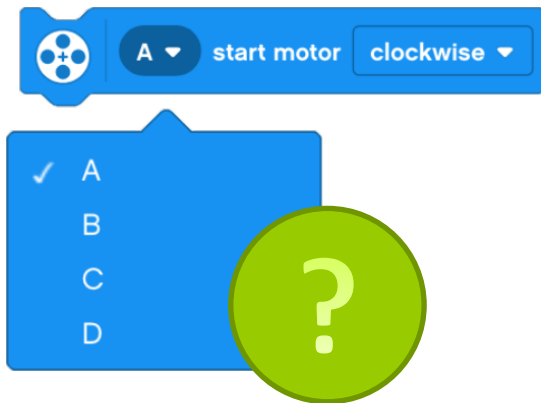


Selecting the layer and the port

- In EV3 Classroom there is not a way to select the layer
- Use variables with this formula instead

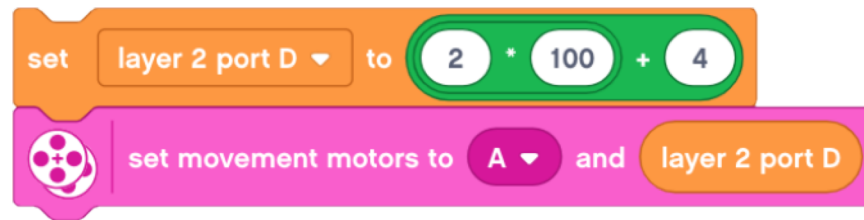
$$\textit{layer} \times 100 + \textit{port}$$

- The layer and port are both numbers between 1 and 4
- For output ports A = 1, B = 2, C = 3, and D = 4



Movement blocks

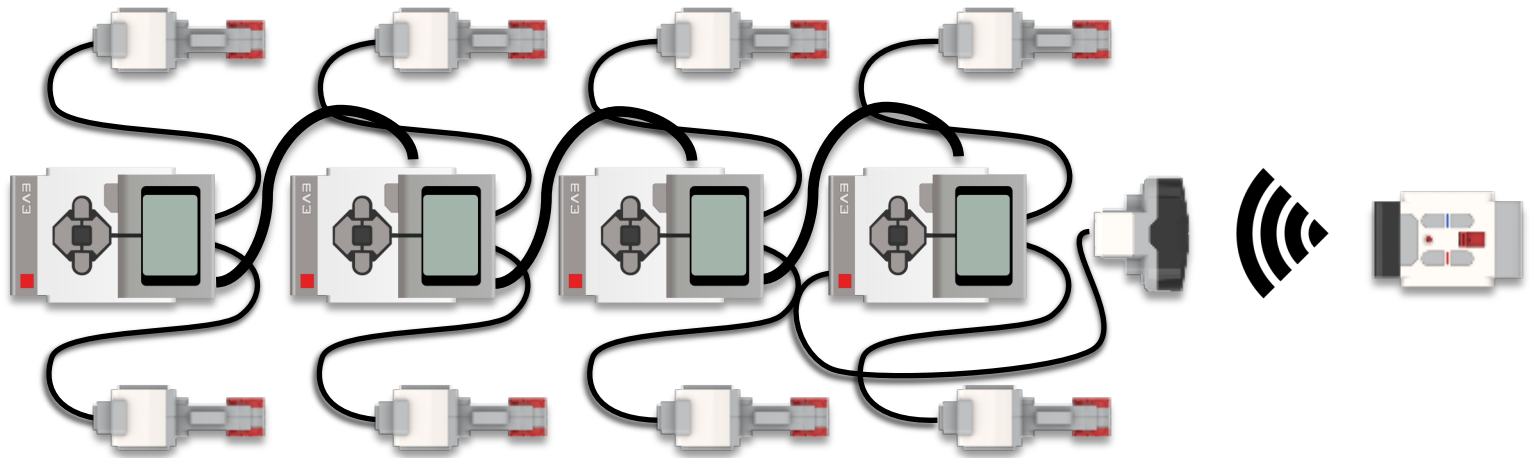
- For movement blocks only add the layer to the right motor port



- Only one pair of motors can be used with the movement blocks per layer

Super-tank example

- Super-tank has 4 EV3 bricks, 8 motors and 1 infrared sensor
- All port B motors drive the left tank tread and all port C motors drive the right tank tread



Super-tank example

- The left buttons on the remote control the left motors connected to port B on each EV3 and the right buttons control the right motors connected to port C on each EV3

The image displays six code blocks arranged in a 3x2 grid, designed for an EV3 robot. Each block starts with a yellow 'when beacon 1' trigger. The left column of blocks controls port 2 (left motors), and the right column controls port 3 (right motors). The top two rows show starting motors at 50% and -50% speed, while the bottom row shows stopping the motors.

Trigger	Action
when beacon 1 top left button pressed	start all port 2 motors at 50 % speed
when beacon 1 top right button pressed	start all port 3 motors at 50 % speed
when beacon 1 bottom left button pressed	start all port 2 motors at -50 % speed
when beacon 1 bottom right button pressed	start all port 3 motors at -50 % speed
when beacon 1 no left buttons pressed	stop all port 2 motors
when beacon 1 no right buttons pressed	stop all port 3 motors

Super-tank example

- The repeat loop tells the motor on each of the 4 layers to start or stop

The image displays two Scratch code snippets on a light gray grid background. The left snippet defines a function 'start all port' and a loop that starts motors on 4 layers. The right snippet defines a function 'stop all port' and a loop that stops motors on 4 layers.

Left Snippet:

- define start all port port motors at speed % speed
- set layer to 1
- repeat 4
 - set layer plus port to $\text{layer} \cdot 100 + \text{port}$
 - layer plus port start motor at speed % speed
 - change layer by 1

Right Snippet:

- define stop all port port motors
- set layer to 1
- repeat 4
 - set layer plus port to $\text{layer} \cdot 100 + \text{port}$
 - layer plus port stop motor
 - change layer by 1

Credits

- This tutorial was created by David Lechner
- More lessons at www.ev3lessons.com



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