Lesson 1: Motors and Sound Programming Solutions

Learning to program

- An effective way to learn to program is to learn to “read” a program.
- Follow the steps and understand what each does. See how they fit together.
- Then you can do your first program by modifying an existing program.
- First we’ll look at some programs here and understand what they do.

Exercise 1: What does this do? See how much you can guess.

Exercise 1: Solution

Turn on motors connected to ports A and C in the reverse direction for 4 seconds, then stop both motors.

Green light always starts your program
Turn on motors A and C
Stop all motors
Red light always ends your program

The white arrow to the left means “reverse”
Wait for 4 seconds

Exercise 2: Solution

Turn on motor A in the forward direction for a random amount of time, then stop the motor.

Use the watch icon with the dice, which means “random”

Things to notice

- Every program has a beginning and end. (Traffic lights.)
- All icons are connected with “wires.”
- This program is linear—one step follows another from beginning to end.
Exercise 3: Solution

Turn on motor A in the forward direction for 2 seconds, stop the motor, and beep once. Then turn on motor C in the reverse direction for 2 seconds, stop the motor, and beep twice.

Remember, the white arrow to the right means “forward” and the white arrow to the left means “reverse.” Use 2 Play Sound icons to play 2 beeps.

Key Point!

- Writing down programs step by step in English makes them very easy to write in RoboLab.
- Think about how to solve the given problem, then work out the logical steps. Write down the steps before writing your program.

Problem 1a

Why can’t I download my program to the RCX?

Solution 1a

The RCX was facing the wrong direction. (Don’t forget to turn it on too!)

InfraRed receiver must face IR Tower

Problem 1b

Why won’t the motor work?

This is a sensor port, NOT a motor port.
Solution 1b

It was connected to a sensor port. Motor ports are A, B, and C.

Problem 1c

What is wrong with this program?

Solution 1c

Bad wiring. Always check for bad wires.

Problem 1d

This program is supposed to turn on Motor A for 4 seconds, then turn off the motor. What's wrong?

Solution 1d

There was no “Stop Motor” icon.

Mentor session assignment

- You will start by writing (copying) a somewhat complicated program for a line follower robot and test it on your Tug of War vehicle. (You’ll have to add a light sensor that points at the ground.)
- Then you’ll delete most of the program to do our simple Tug of War program.
- For Tug of War your robot will turn on the motors when a touch sensor is pressed. This is a requirement of the assignment.
- You can’t compete if your robot can’t perform this simple task.
• http://www.education.rec.ri.cmu.edu/previews/rcx_products/robolab_video_trainer/rob_vid_train_preview.htm#