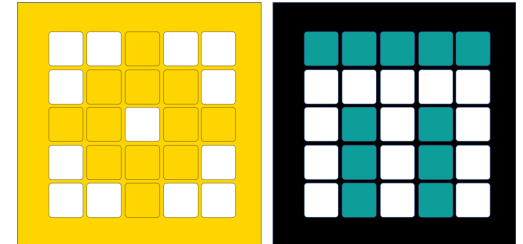


PRIME LESSONS

By the Makers of EV3Lessons



EVENT SYNCHRONIZATION

BY SANJAY AND ARVIND SESHAN

This lesson uses SPIKE 3 software

LESSON OBJECTIVES

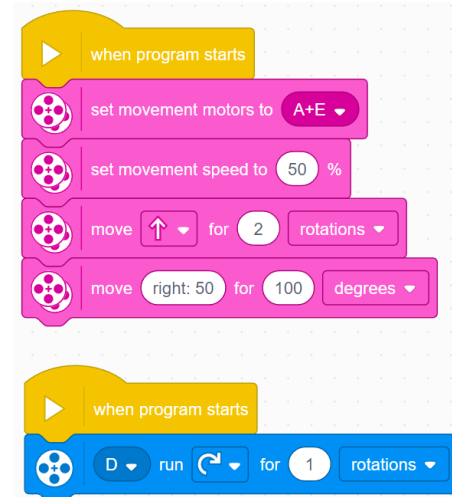
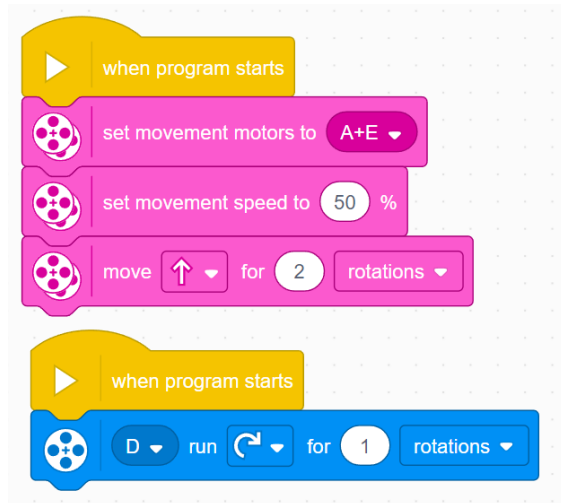
- Understand what the “synch problem” is when you use events
- Learn techniques to ensure that two events end before moving to the next block of code (Variables and Wait Blocks)

USING EVENTS INSIDE PROGRAMS

- Events are great for doing two things at the same time
 - Often want to do something after you complete the event
 - Hard to tell which event will finish first (called the “synch problem”)
- Need to synchronize the events to make sure that blocks execute when you expect them to

In the picture below, will the 100 degree turn start after motor D is done or before?

Answer: You do not know

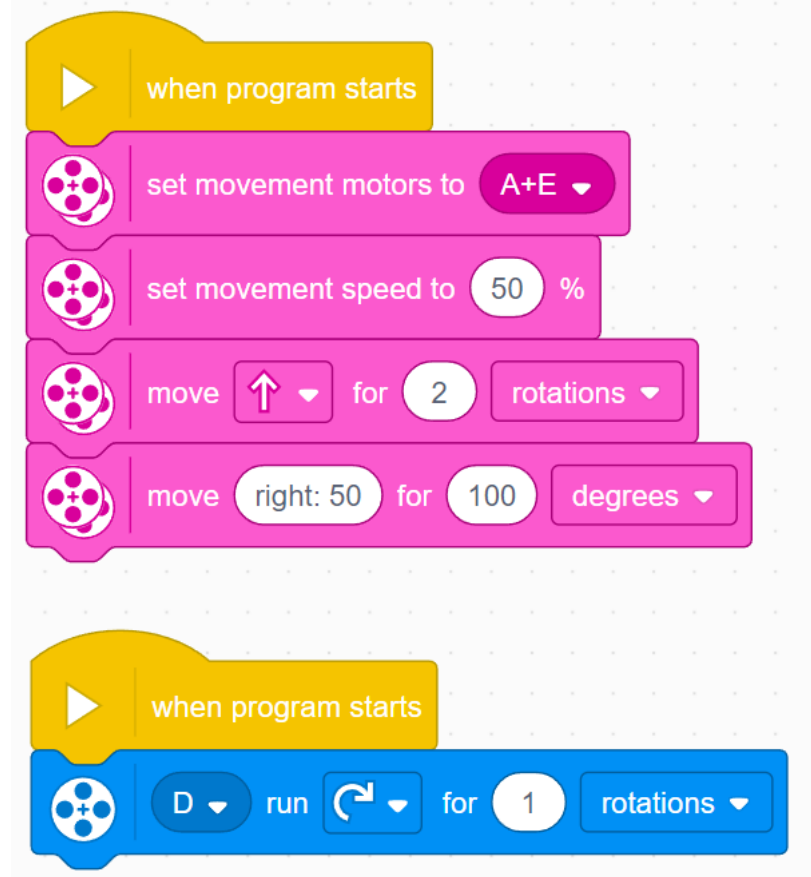


2 rotation move
100 degree turn

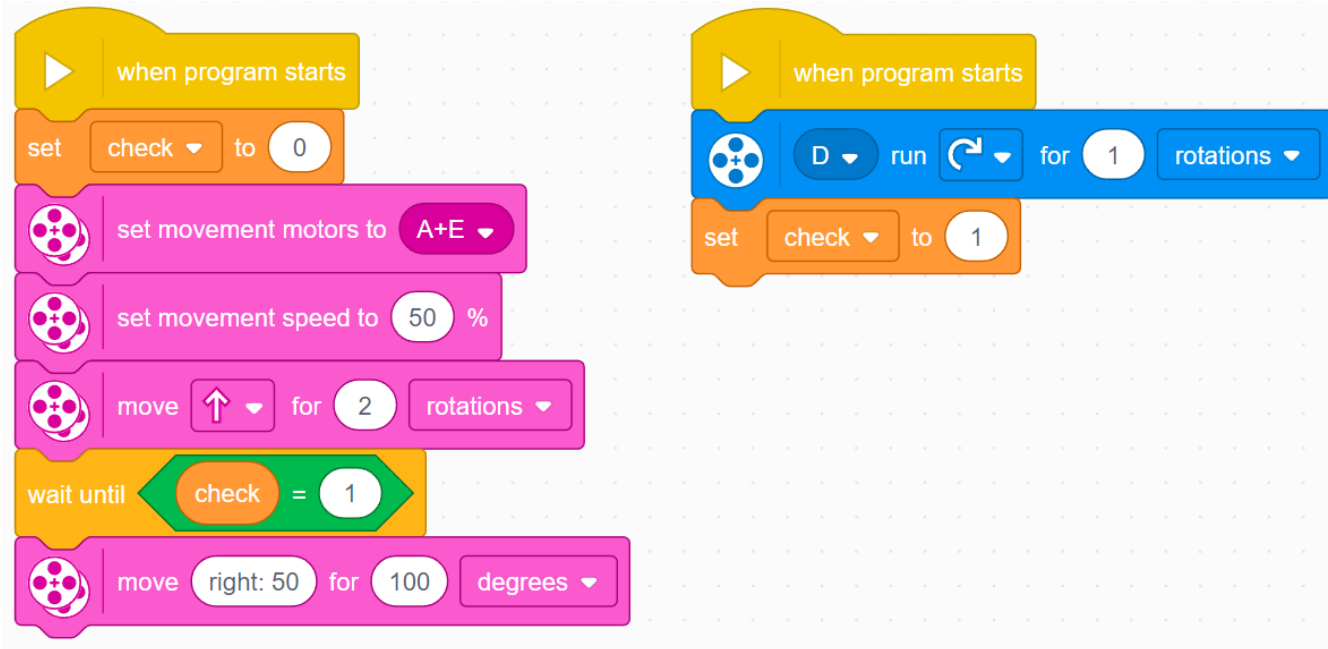
Motor D run
for 1 rotation

ENSURE THAT BOTH BEAMS FINISHED

- In this example, we want both the 2 rotation move and the motor D move to finish before the 100 degree turn
- Variables can be used to solve the synch problem



USE VARIABLES TO SYNCHRONIZE



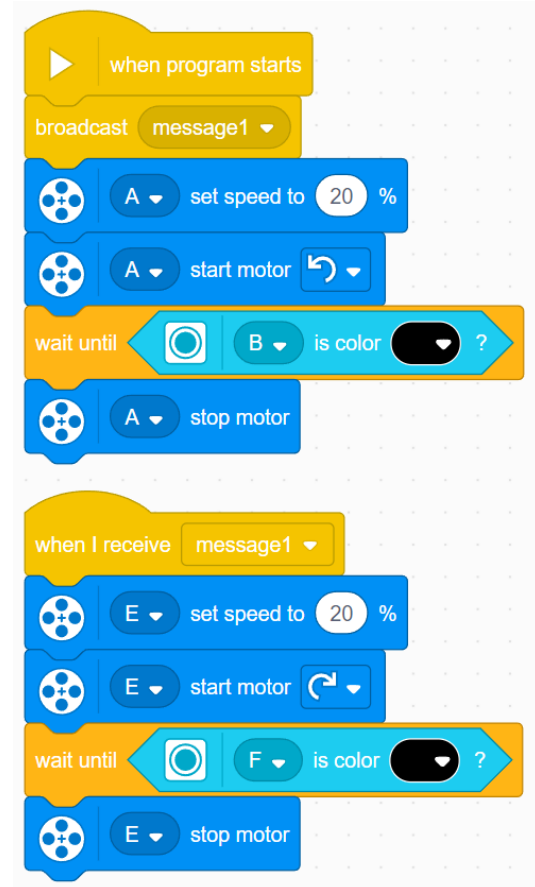
1. Set variable “check” to a number that is not 1
2. Set movement motors and speed
3. Move straight for 2 rotations
4. Wait for second event to finish by waiting for “check” to be set to 1
5. Turn right for 100 degrees

1. Turn Motor D 1 rotation
2. Set check to 1

CHALLENGE: SQUARING ON A LINE

- Synchronization is critical for aligning on a line using events
- As a challenge, complete the Squaring on Line lesson.
- Note: You must ensure that both events in an align are completed before moving onto the next block
 - Otherwise, the robot will not be straight on a line

This example is from the Squaring on a Line Lesson



DISCUSSION GUIDE

1. What is the “sync problem”?

Ans. When you write code with multiple events, you are not certain when the two events will complete. You don't know if one event might finish before the other.

2. How can this be solved?

Ans. The problem of synchronization can be solved by using Wait Until Blocks and Variables. The second event will set a variable to a specific value at its end and the first event will wait for that value to be set.

CREDITS

- This lesson was created by Sanjay Seshan and Arvind Seshan for SPIKE Prime Lessons
- More lessons are available at www.primelessons.org



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