

Advanced Programming Lesson: Parallel Beam Synchronization

EV3 LESSONS AND DROIDS ROBOTICS



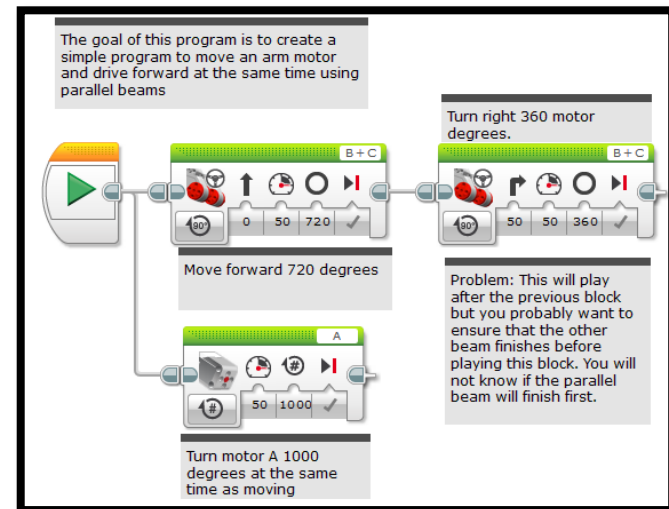
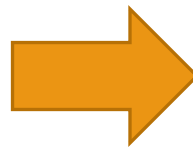
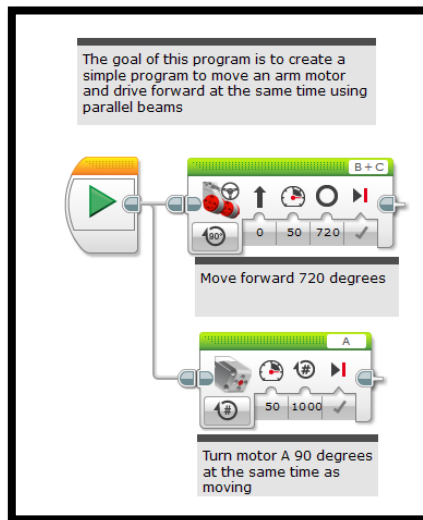
Using Parallel Beams Inside Programs

Parallel beams are great for doing two things at the same time

- Often want to do something after you complete the Parallel Beam
- Hard to tell what order program which beam will finish first.

Need to synchronize the beams to make sure that blocks execute when you expect them to

In the picture below will the turn start after motor A is done or before? **Answer: You do not know**



Ensure That Both Beams Finished

In this example, we want both the 720 degree move steering (the move) and the motor A move to finish before the 360 degree move steering (the turn)

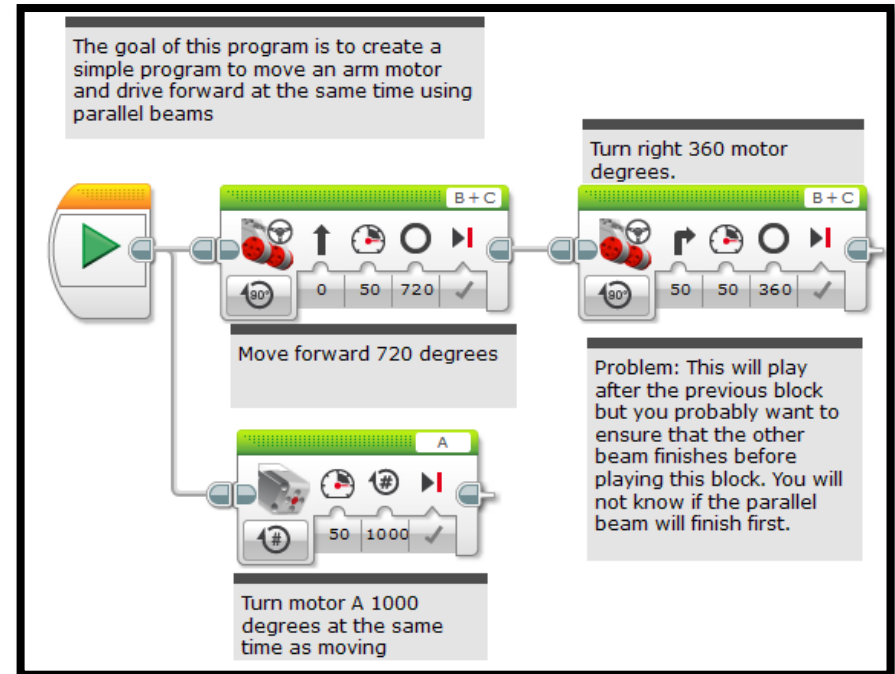
There are several ways to do this:

Variables (see slide 4)

Wires (see slide 5)

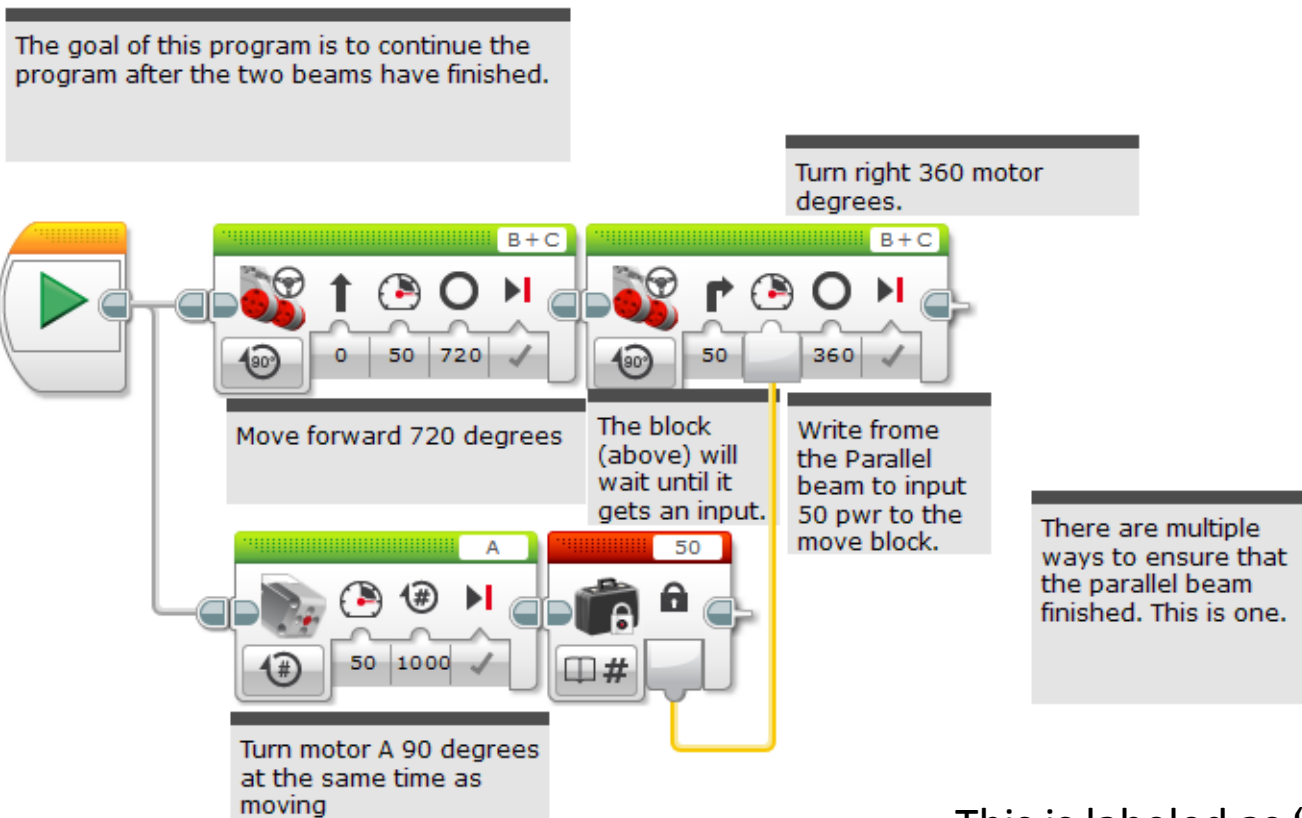
Loops (see slide 6)

My blocks (see slide 7)



This is labeled as “synch problem” in the corresponding EV3 code file

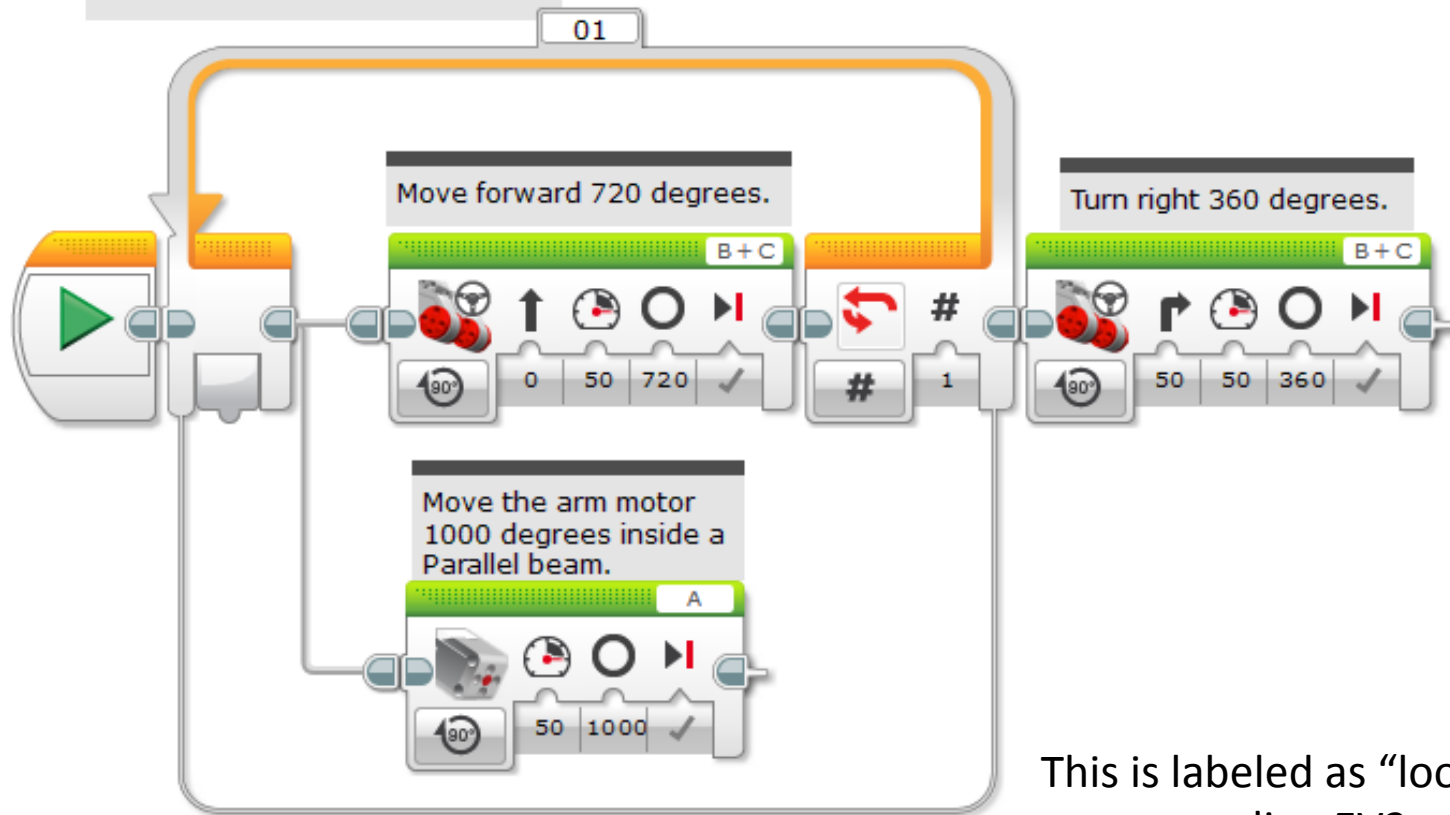
Use Wires to Synchronize



This is labeled as “wires” in the corresponding EV3 code file

Use Loops to Synchronize

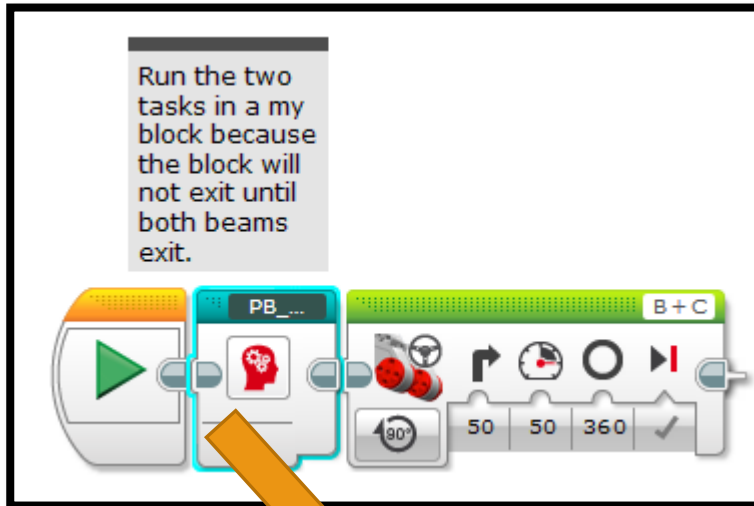
Run the parallel beam inside a loop because the loop will not exit until both beams finish.



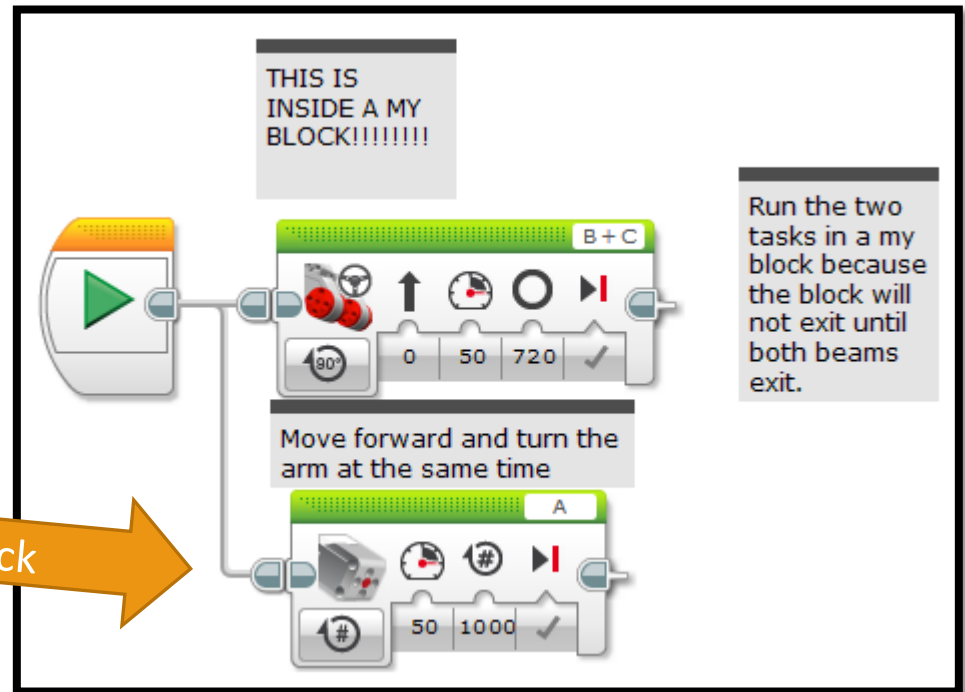
This is labeled as “loops” in the corresponding EV3 code file

Use My Blocks to Synchronize

This is labeled as “My Blocks” in the corresponding EV3 code file



This is labeled as “Parallel_Beam_My_Blocks” in the corresponding EV3 code file



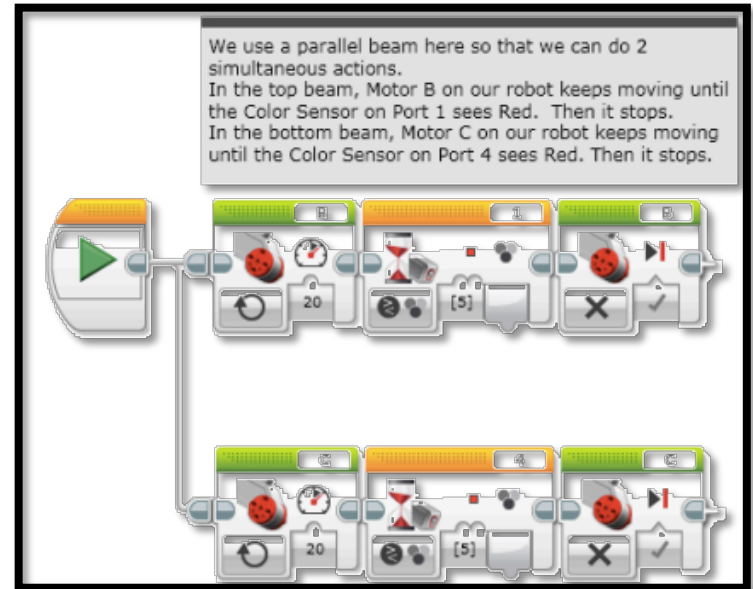
Another Example

Synchronization is critical for aligning on a line using parallel beams (see lesson...)

You must ensure that both beams in an align are completed before moving onto the next block

- Otherwise, the robot will not be straight on a line

Any of the techniques from this lesson would work. We chose to use the My Block synchronization technique in the Squaring on a Line/Aligning lesson in the Advanced Tab.



This example is from the Squaring on a Line Lesson

Credits

This lesson was written by Sanjay Seshan and Arvind Seshan on FLL Team Not the Droids You Are Looking For

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