

Programming Challenge

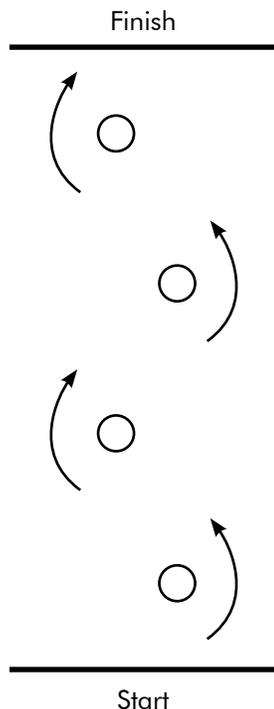
Robo-Slalom Investigation Page 1

Investigation Description

In this investigation you will attempt to improve the drivability of your robot. Begin testing with the program that you developed in the *Remote Control* section that directly maps the feedback from the joystick to the power levels the motors receive.

Run your tests on a teacher/student designed slalom course similar to the course pictured below. After testing the direct mapping configuration, iteratively test and adjust your control by mathematically manipulating the values of the joysticks. Divide the joystick signal by 2, 4, and 8, testing each configuration to determine which version gives you the best driving control. Complete the chart and questions on page 2 of this handout for full credit.

Course Layout



Sample Code

```

1 task main()
2 {
3   while(1 == 1)
4   {
5     motor[leftMotor] = vexRT[Ch3];
6     motor[rightMotor] = vexRT[Ch2];
7   }
8 }

```

Programming Challenge

Robo-Slalom Investigation Page 2

Change the values of the motor powers in your program and then test your robots ability to complete the slalom. Use the Actual Completion Time in the first mapping to determine the Estimated Completion Times for the remaining 3 mappings. Complete the table below as you run your investigation. Use the information from the chart to complete the questions below.

Chart

Joystick Mapping	Estimated Completion Time (seconds)	Actual Completion Time (seconds)	Notes
<pre>motor[port3] = vexRT[Ch3]; motor[port2] = vexRT[Ch2];</pre>	Actual measured time		
<pre>motor[port3] = vexRT[Ch3]/2; motor[port2] = vexRT[Ch2]/2;</pre>	(Completion Time / 2)		
<pre>motor[port3] = vexRT[Ch3]/4; motor[port2] = vexRT[Ch2]/4;</pre>	(Completion Time / 4)		
<pre>motor[port3] = vexRT[Ch3]/8; motor[port2] = vexRT[Ch2]/8;</pre>	(Completion Time / 8)		

Were each of the Estimated Completion Times roughly the same as their actual Completion Times? If not, which Joystick Mapping had the largest difference?

Speculate as to why there was such a large difference.

Which Joystick Mapping scheme gave you the best combination of speed and control?