

**AP CSP Python with Robots
Mission 6 Obj 7-8 Assignment**

Name:

Mission 6 Introduction

Read the introduction and project goals. During this assignment, you will complete the last two goals.

Mission 6 Objectives 7-8

Start Objective 7. Collect your data by running the experiment as explained in “Try Your Skills.”

Remember to comment out
`# motors.enable(True)`

If you are using the 3/4 inch black electrical tape, your data should be the same as the chart in the objective panel. However, if you have a thicker line, you need to create your own data chart.

When you are finished, restore `motors.enable(True)`

Complete Objective 7. Follow CodeTrek to make changes to your code.

You do not need to include `SPEED_LIMIT` if you don't want to. Your `drive()` function works fine as is. Or you can try it.

Do a lot of testing to make sure your program works before continuing to the next Objective. The speeds in CodeTrek are just suggestions. Try each course and adjust the values for each branch as needed. When finished, the 'bot should steer each course at a decent speed.

Paste a code snippet of your **if branching statement** with its final values:

If students follow CodeTrek, their code will look like this. But during testing, they may find they need different speeds and/or conditions.

```
if vals == (1, 0, 0, 0, 0):  
    drive(-20, 50)  
elif vals == (1, 1, 0, 0, 0):  
    drive(0, 60)  
elif vals == (0, 1, 1, 0, 0):  
    drive(40, 80)  
elif vals == (0, 0, 1, 1, 0): # Center  
    drive(100, 100)  
elif vals == (0, 0, 0, 1, 0):  
    drive(100, 80)  
elif vals == (0, 0, 0, 1, 0):  
    drive(80, 40)  
elif vals == (0, 0, 0, 1, 1):  
    drive(60, 0)  
elif vals == (0, 0, 0, 0, 1):  
    drive(50, -20)
```

Start Objective 8. Click on [Locals and Globals](#) to add it to your toolbox. Read about local and global variables.

What is a global variable? Discuss its scope and lifetime.

What is a local variable? Discuss its scope and lifetime.

What code must you include if you want to update a global variable inside

A global variable is defined outside of a function. Its lifetime is the whole time the program is running. The scope is the whole file.

A local variable is created inside a function. It only exists while the function is running. They can only be used in the function where it is created.

To update a global variable inside a function, you must use the `global` keyword.

<p>a function?</p> <p>Click on Math to add it to your toolbox.</p> <p>What are two data types for numbers?</p> <p>What are some math functions available in the math library?</p>	<p>Two types of number data types are integer and float.</p> <p>Math functions available are abs(), divmode(), max(), min() and round()</p>
<p>Complete Objective 8. Follow CodeTrek to define the function calibrate() and add the function call to the first while True: loop.</p>	<p>Reminder! You need to add an import statement for sleep</p> <pre>from time import sleep</pre>
<p>Run the code by driving CodeBot on a wind-y course.</p>	
<p>Take the quiz.</p> <p>How did you do? Is there anything you need to practice or review?</p>	<p>Answers will vary</p>
<p>After Objective 8 and the Quiz, submit your completed LineFollow1 program to the teacher.</p>	