AP CSP Python with CodeX **Mission 9 Assignment**	**Name:**
Getting Started	
In this project you will create a game spinner that shows a realistic spinning arrow when a button is pressed. Think of the applications! **During this lesson you will complete all the goals.**	
Mission 9: Game Spinner Objectives	
Complete Objective 1 The arrows list is already defined. You do not need to create it. The instructions and CodeTrek give three ways to get a random arrow. Which way are you using in your code? *Create the file and run the code. Use CodeTrek as needed.*	The ways presented are: • Get a random number using '8' and use it as the index. • Assign the length of the list to a variable, and use it when generating a random number for the index. • Use random.choice(ALL_ARROWS) Students may use one of those, or come up with their own way.
Take the quiz. How did you do? Is there a concept you need to review?	Answers will vary
Complete Objective 2 Click on logical operators. List the logical operators used by Python: *Change the code to add an infinite loop and a logical operator with the button press. Use CodeTrek if needed.*	The logical operators are or, and, and not.
Complete Objective 3 You have been using functions for quite awhile. CodeSpace introduces them in this mission. Click on functions to add it to your toolbox. Give two other names for a function: What does the keyword def mean? *Complete the code. You should be able to do this objective on your own.*	Functions can also be called procedures or methods. def means "define function."
Complete Objective 4 Read ALL the information and take notes as needed. Why don't you use an infinite loop for the spin animation? What line of code updates the index variable?	The spin animation shouldn't go on forever. There are 8 arrows in the list, so the loop just needs to run 8 times. index = index + 1 (increment)

Complete the code. Use CodeTrek if needed.	
Take the quiz. How did you do? Is there a concept you need to review?	Answers will vary
Complete Objective 5 Click on simulation. This topic is part of the AP CSP curriculum. What is a computer simulation? Click on parameter and argument. What are parameters and arguments used for? *Complete the code. Use CodeTrek.*	Code that builds a model of something and lets you play with that model and explore virtual situations. It is like a virtual world. Parameters and arguments are used to pass data or information to a function.
Complete Objective 6 Read ALL the information, and take notes as needed. Click on local variables. Give a fact you learned about local variables: *Complete the code by changing the argument. Then use the debugger. Read the hint for help.* The code will now throw an error. What is the value of **index** when the error occurs?	Two main facts are given about local variables: • Local variables are created inside a function. • They only exist while the function is running. The index is 8 when the error happens. (Index for arrows is 0 through 7, so when the index is 8, error!)
Complete Objective 7 Read ALL the information and take notes as needed. What is the difference between = and ==? *Complete the code, using CodeTrek.* What local variables are you using?	The = is used to assign a value, and == is used to compare. The local variables in spin_animation() are index and loops.
Complete Objective 8 Read ALL the information and take notes as needed in the space provided. *Complete the code by adding another variable. Can you do this on your own? Use CodeTrek as needed.*	Notes as needed
Go to the sandbox. In the last lesson, you learned about modulo division, and you used it to modify a program to keep the index in range. This program also uses an index, and an if statement to keep the index in range.	

- Use modulo division in the spin_animation() function to keep the index in range.
- Delete the if statement
- Use modulo division to assign a value to index: index = loops % len(pics.ALL_ARROWS)

Run the program and make sure there are no bugs before submitting.

```
def spin_animation(count):
    index = 0
    loops = 0
    delay = 0.0
    while loops < count:
        loops = loops + 1
        display.show(pics.ALL_ARROWS[index])
        sleep(delay)
        delay = delay + 0.005
        index = loops % len(pics.ALL_ARROWS)
```

Submit the ***Game_Spinner*** program to the teacher.