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| **AP CSP Python with CodeX**  **Mission 11 Assignment** | | **Name:** |
| **Getting Started** | | |
| In this project you will create a digital level using the CodeX’s built-in accelerometer and display. **During this lesson you will complete all the goals.** | | |
| **Mission 11 : Spirit Level Objectives** | | |
| Complete Objective 1 Click on accelerometer.  What is the accelerometer?  What are the three directions of the accelerometer?  *Create the file. Close the objective panel to see the CodeX in 3D for the 2nd goal.* |  | |
| Complete Objective 2 Read ALL the information, and take notes as needed.  How is a tuple different from a list?  What function reads the accelerometer?  What code will access the raw value of y?  *Follow CodeTrek as needed.* |  | |
| Complete Objective 3 Read ALL the information, and take notes as needed.  What does the accelerometer measure?  What does the measurement need to be converted to in this project?  *Complete the code. You are going to do some math! Use CodeTrek.* |  | |
| Complete Objective 4 Read ALL the information, and take notes as needed.  What is the size of the CodeX screen?  What does display.fill() do?  What does display.draw\_line() do?  What does display.draw\_circle() do?  *Complete the code. Use CodeTrek if needed.* |  | |
| Complete Objective 5 Read ALL the information, and take notes as needed.  *Complete the code. Use CodeTrek as needed. Be careful with the indenting!*  What happens when you tilt the CodeX? |  | |
| Take the quiz. How did you do? Is there a concept you need to review? |  | |
| Complete Objective 6 Read ALL the information, and take notes as needed.  How do you fix the problem from Obj. 5?  *You should be able to do this objective on your own. Use CodeTrek as needed.* |  | |
| Go to the sandbox.  Make this change to your program.   * Create a function for the section of code that converts the accelerometer reading to degrees.   + The degrees are used in the main program as well, so you may think you need a global variable.   + Another alternative is for the function to return the degrees.   + Notice I changed tilt\_x to just tilt, so the function can convert for tilt\_y as well (abstraction!).   + The function will look like this:      * + And the function call will look like this:      * Optional: Create a function for the background. * Optional: Add code for a button press to stop the program and clear the screen. | | |
| CHALLENGE!  Right now the level is one-dimensional. It only uses the x reading. Add code to your program that will also read the y value, convert the reading to degrees, and use the data when drawing the circle. A 2D spirit level! | | |
| Run the program and make sure there are no bugs before submitting. Submit the ***Spirit\_Level*** program to the teacher. | | |