| **AP CSP Python with CodeX****Mission 14 Assignment** | **Name:** |
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| **Getting Started** |
| In this project you will journey into the magic of computer graphics by using pixels and loops to create patterns. **During this lesson you will complete all the goals.** |
| **Mission 14 : Line Art Objectives** |
| Complete Objective 1Click on console. Give two facts about the console:What function draws a single pixel?What function reads a pixel color?*Create the file. Use CodeTrek to get started.*The get\_pixel() function returns a tuple for the color at that pixel. What is the tuple for CYAN? | Follow CodeTrek to get started. End your code with this: |
| Take the quiz. How did you do? Is there a concept you need to review? |  |
| Complete Objective 2Click on pixel. What is a pixel?*Follow CodeTrek to add code. Delete most of the code from Obj. 1 and replace it with a for loop.* |  |
| Complete Objective 3What is a magic number?How can you avoid magic numbers?*Follow CodeTrek.*This code will cause an error. Before you run the code, what do you think will cause the error?What is the error message? |  |
| Complete Objective 4CodeTrek shows you one way to fix the bug. What is another way to avoid a float?*Follow CodeTrek to fix the bug*. |  |
| Complete Objective 5Read ALL the information, and take notes as needed.What does the step parameter in range() do?What is a matrix, and how is it created?*Complete the code. Use CodeTrek as needed.*  |  |
| Take the quiz. How did you do? Is there a concept you need to review? |  |
| Complete Objective 6Read ALL the information, and take notes as needed.*Do a File→Save As.. Then complete the code. Try to do this without help. Use CodeTrek as needed.*  |  |
| Complete Objective 7Click on envelope. What is an envelope? (You don’t need to understand all the math.) |  |
| Complete Objective 8Read ALL the information, and take notes as needed.*Complete the code. Try to do this without help. Use CodeTrek as needed.* Start with WEB\_SPACING = 40. Then decrement the spacing by 10; run again. Repeat until the spacing = 10.What do you notice when the web spacing is small? |  |
| Complete Objective 9Read ALL the information, and take notes as needed.CodeTrek shows how to create a function for the webbing. What is a docstring?What is a delta?Your line art does not need to have the lines in CodeTrek. It can be any kind of line art.  |  |
| Go to the sandbox.Make these three changes to your program.* Change the magic numbers 120 and 239 to their respective variables.
* Create a function for the background: blue rectangle, white grid dots and red axis lines. Call the function in the main program.
* Create a function for the line art. Call the function in the main program.
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| CHALLENGE!Use buttons to create different line art. Here are some suggestions:* Use a button for one web size, and a different button for a different web size.
* Change the web spacing with button presses (like the heartbeat program). Change the WEB\_SPACING constant in the line art to a variable (like spacing) and use a parameter in the line art function.
* Add an introduction and a button press to end the program
* Use buttons for different line art. One button draws a line art picture, and another button draws a different line art picture.
* Get a random color for each web.
* Use a button press for a single web. After pressing all the buttons, the line art picture is complete.
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| **Wrap-Up** |
| How did you use your creativity to complete the program? |  |
| This program can be frustrating! How did you manage your frustrations and work through problems? |  |
| Run the program and make sure there are no bugs before submitting. Submit the ***Line\_Art*** program to the teacher. |