| **AP CSP Python with CodeX**  **Mission 14 Assignment** | | | | | | **Name:** | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 1 Click 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 2 Click 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 3  What 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 4  CodeTrek shows you one way to fix the bug. What is another way to avoid a float?  *Follow CodeTrek to fix the bug*. | | | | | |  | | | | | |
| Complete Objective 5 Read 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 6 Read 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 7 Click on envelope.  What is an envelope? (You don’t need to understand all the math.) | | | | | |  | | | | | |
| Complete Objective 8 Read 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 9 Read 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. | | | | | | | | | | | |
| 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. | | | | | | | | | | | |
| **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. | | | | | | | | | | | |