Assignment 2 | Due 6/8 at 12 PM

Part 1 - xy Distance Formula Implementation

The Distance Formula is an equation that represents the distance between two coordinates on a dimensional plane. In this exercise, you are required to find the distance between several (x,y) coordinates and save them into a list.
You are provided two pairs of coordinates: x1 and x2, and y1 and y2. The coordinates x1 and y1 pair with each other when plotted on a graph. x2 and y2 go with each other as well. All the values of x1, x2, y1, and y2 are provided and your job is to implement them in the distance formula.

Your job is to create a new list called 'D' and save all the distances between (x1,y1) and (x2,y2) coordinates. Use a for loop and bracket notation to make this process easier for you.
(hint: when creating the list D, use the len() function to get the length of one of the provided lists - since the number of distances is equal to the number of values in x1, x2, y1, or y2.)

For example:
D[i] = distance between (x1[i],y1[i]) and (x2[i],y2[i])
The distance formula is given as follows:

The Distance Formula

The distance between two points $P_1 = (x_1, y_1)$ and $P_2 = (x_2, y_2)$ in the xy-plane is given by the distance formula,

$$d(P_1, P_2) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}.$$

You will need to look into how to perform the square root operation and exponent operation using the math library.
Use this as a reference: https://www.programiz.com/python-programming/modules/math

This should be the contents of your D list::

D - List (10 elements)

Inde	Type	Size	Value
0	float	1	1.0
1	float	1	3.1622776601683795
2	float	1	5.385164807134504
3	float	1	7.615773105863909
4	float	1	9.848857801796104
5	float	1	12.083045973594572
6	float	1	14.317821063276353
7	float	1	16.55294535724685
8	float	1	18.788294228055936
9	float	1	21.02379604162864

Name this file **DistanceFormula.py**

Part 2 - Creating Scatter and Line Plots

In this exercise, your task is to plot two figures of x2 and y2 against each other in plot and scatter format. In other words, use plt.plot and plt.scatter to compare how Python shows the same points but in different types of plots. Use plt.show() to create a new figure for each plot. (don't forget to import matplotlib)
Include a title, legend, and axes labels.

Next, multiply all the values in x2 by 5 and square root all the values in y2. Plot these updated values in plot and scatter format. Include a title, legend, and axes labels.
(hint: use a for loop to update all the values and import the math library like in part 1 to perform the mathematical operations)

In total you should have 4 separate figures, 2 line plots and 2 scatter plots.
Name this file **Plotsv2.py**