Practicing For Loops and Scale Models:

1. Create a new Kaggle notebook and copy and paste the numpy arrays from the intro to python lab notebook into your new notebook.

```
planets = np.array(["Mercury", "Venus", "Earth", "Mars", "Jupiter", "Saturn", "Uranus", "Neptune"])
a_in_AU = np.array([0.387, 0.723, 1.000, 1.524, 5.20, 9.6, 19.2, 30]) #The semi-major axis length in AU for each planet
P_in_yr = np.array([0.241, 0.615, 1.000, 1.881, 11.9, 29.5, 84.0, 164.80]) #The orbital period in years for each planet
```

2. Let's scale the distance between Neptune and the Sun (x_{real} = 30 AU) down to x_{scale} = 100 yards (the length of an American football field, not counting the end zones).

   Recall, the equation we have been using for scale models is the following:

$$\frac{x_{scale}}{x_{real}} = \frac{y_{scale}}{y_{real}}$$

   where we can call the left side of the equation the scale factor:

$$scale\ factor = \frac{x_{scale}}{x_{real}}$$

   Find the scale factor for this scale model. (Hint: the units will be yards per AU)

   Create a new variable in your notebook called scaleFactor and set it equal to the number you find. While you do not have to include units in your code for it to work, you should mention them in a comment via the # command.

3. Now that we have the scale factor, we can rearrange the equations above to solve for the scale model sizes of each of the orbits for the other planets. That is,

$$y_{scale} = (scale\ factor) \cdot y_{real}$$

   Write a for loop in your notebook to compute the semi-major axis of each planet's orbit in your scale model and print it to the screen. Write your code down in this assignment.

4. If the Sun is at one end of the football field and Neptune at the other, approximately how many yards are between the Earth and the Sun? What about between Earth and Neptune?

5. If the Sun is at one end of the football field and Neptune at the other, approximately sketch and label the positions of the planets corresponding to their scaled down semi-major axes.