

Self-Assessment for Wednesday 2/14

This self-assessment covers material from Sections 1.8–1.10 and 2.1–2.11 of Modeling and Simulation in Python.

It is open book, open notes, open computer. You can take as long as you need. You should make a reasonable effort to complete the diagnostic on your own. Then check your answers with a classmate.

Code (for Sections 1.8–1.10 and 2.1–2.7)

1. Recall your code from the first assignment that creates a **System** object named **penny** with system variables **heads** and **tails**, both assigned with value 0.

Write a for loop that calls **flip** 10 times with probability 0.5 and uses the **System** object from the previous question to count the number of heads and tails.

2. By using your answer to the previous question as a guide, create a new function called **flip_count** that takes **n** and **p** as parameters, where **n** is the number of times to flip and **p** is the probability of heads. Run the function a couple of times with different parameters to make sure that it works how you would expect.

3. Write a function called **update_heads** that takes as parameters a **System** object like **penny** and an integer **n**. It should add **n** to the **heads** variable of the **System** object.

4. Write a function called **flip_until_tails** that takes as parameters a **System** object like **penny** and a probability **p**. The function should call **flip** up to 1000 times with probability **p** and return the number of *heads before the first tails*.

*Hint: Use a **return** statement when the first tails occurs to return immediately without completing the loop.*

Vocabulary (for Sections 2.6–2.11)

Fill in the blanks in the following sentences with the words that make the most sense.

1. A simulation that does the same thing every time it runs is called _____; whereas, a simulation that incorporates some aspects of randomness is called _____.
2. After you run a simulation, you often compute a summary statistic that quantifies some aspect of the behavior of the system. Such a statistic is called a _____.
3. A value that gets passed into a function is called a _____. A value that gets returned from a function is called a _____.
4. The method of programming that we discussed in class and that builds a working program piece by piece is called _____.
5. Write a few sentences that answer the following two questions:

What does **sweeping** a parameter mean? How does `modsim`'s `linspace` command help to sweep a parameter?