Self-Assessment for Wednesday 2/28

This self-assessment covers material from Sections 3.1–3.10 and 4.1–4.2 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.

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Vocabulary (for Sections 4.1–4.2)

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

1. In a Pandas Series, missing data are represented by the special value _____, which is shorthand for _____.

2. We can drop missing data using the _____ function.

3. Write a few sentences that answer the following question:

   What is the difference between a prediction and a projection?

Code (for Sections 3.1–3.10)

1. Write a function called `flip_every_day` that takes in `n`, `p`, and `num_days` as parameters. It should flip `n` times a coin that gives heads with probability `p` everyday for `num_days` days, and stores the number of heads each day in a `TimeSeries` object, and return this `TimeSeries` object.

   Hint: To count the days, use `linrange(1,num_days)`.

2. As you saw in the Chapter 3 notebook, you can compute the maximum absolute difference between two `TimeSeries` objects like this `max(abs(series1 - series2))`. Wrap that line of code in a function named `max_abs_diff` that takes two TimeSeries objects as parameters and returns the maximum absolute difference between them.

3. Suppose you have two functions:

   - `run_measurement` takes no parameters and returns a `TimeSeries` of measurements.

   - `run_simulation` takes a `TimeSeries` of measurements as a parameter, runs a simulation based on the measurements, and returns a `TimeSeries` with the simulation results.

   Write a function called `compare_measurement_to_simulation` that takes no parameters, uses `run_measurement` and `run_simulation` to compute two `TimeSeries` objects, and returns the maximum absolute difference between the measurements and simulation results.