

DATA 220

Mathematical Methods for Data Analysis

Fall 2021
Instructor: Ron Mak

Assignment #2

Assigned: Thursday, February 4
Due: Thursday, February 11 at 5:30 pm
100 points max

Seaborn Histograms of Random Values

The purpose of this assignment is to give you (and your lab partner) practice generating random values and graphing them with Seaborn histograms.

Use the `random`, `numpy`, and `seaborn` packages to create three histograms of:

- uniformly distributed random integer values
- normally distributed random integer values
- exponentially distributed random integer values

Create a Jupyter notebook containing the histograms. Some online documentation:

- Random number generation: <https://docs.python.org/3/library/random.html>
- Seaborn tutorial: <http://seaborn.pydata.org/tutorial>

Generate about 1000 integer values for each distribution. Generate the uniformly distributed random values in the range 0 – 25 inclusive.

For the normally distributed random values, make the mean 12.5, which was the mean of the uniformly distributed random values. Experiment with the σ (sigma, the standard deviation) argument to generate values that fall mostly in the 0 – 25 range. You can use `if` statements to ignore values outside of this range.

For the exponentially distributed random values, use the same mean to compute the λ (lambda) argument.

The more random values you use for each histogram, the smoother the tops of the bar charts will be. Try ten thousand values, or even a million. Would the charts be smoother if you increased the range, such as 0 – 100? Can you also draw smooth line graphs of the frequencies?

What to submit to Canvas

Submit your notebook into Canvas: **Assignment #2: Seaborn Histograms of Random Values.**

Rubric

Your notebooks will be graded according to these criteria:

Criteria	Max points
Three Jupyter notebooks:	100
• Correct calls to functions from the random package.	• 30
• All three random distributions using the same mean.	• 30
• Correct calls to Seaborn functions to generate the charts.	• 30
• Overall well-designed charts with titles and labels.	• 10