

APHY / ICSI / CINP 451/551

Prof. Kevin Knuth, University at Albany

Fall 2026

EXERCISE #1 (NOT GRADED) : Completion Date: Sept 10, 2026

This is an EXERCISE. It will **not be graded**.

The solution will be posted after the Completion Date.

Please read the attached Chapter 7 from Romke Bontekoe's book

"What is your model?: A Bayesian tutorial"

<https://www.amazon.com/What-your-model-Bayesian-tutorial/dp/B0BTNVFR65>

This chapter introduces you to a number of probability distributions.

The aim of this homework is to write a Matlab script that reproduces the 6 plots, on page 46, of the Gaussian, Laplace, Exponential, Cauchy, Uniform, and Jeffreys distributions.

Your pdf writeup should summarize each of these distributions and include a figure displaying each one. You need not make the plot look identical to the plot in the text. You only need to plot the shape of the curve.

Extra credit of 20 points will go to works that use appropriate colors matching the text, thicken the lines of the plots, and fill in the area under the curve. Such commands look like this (to draw a filled in rectangle of width (x2-x1) and height (y2-y1)):

```
xp = [x1 x2 x2 x1];  
yp = [y1 y1 y2 y2];  
ps = polyshape(xp,yp);  
pg = plot(ps);  
pg.FaceColor = [255,166,166]/255;  
pg.FaceAlpha = 1;  
pg.EdgeColor = 'none';
```

Extra credit of 10 points will go to works that make the axes text and title text larger, so that it is more legible in print (as in a scientific paper). Such commands look like this:

```
title('Uniform Distribution', 'FontSize', 16);  
xlabel('x-axis label', 'FontSize', 14);  
ylabel('y-axis label', 'FontSize', 14);  
fontsize(gca, 14, 'points');
```

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The first exercise will involve plotting and working with the Poisson Distribution, which is missing from Romke's treatment.