Your first task is to get Matlab running on your computer.

After that, create a Matlab script that answers each of the following questions and turn it in using the dropbox on OAK (www.vanderbilt.edu/oak). You can answer all of these problems within one Matlab script (.m file).

Please make sure you comment your code. Please copy or paraphrase the question text as a comment within your code so that I know which part of your script is answering which part of each question on the homework assignment.

In this and future homework assignments, if I ask you to comment on how a piece of code functions or ask you why it does or not do something expected, you can answer that question within a comment within your Matlab code. Only for longer expositions might you want to include a text file along with your Matlab code when you turn in an assignment.

For this assignment, please do not use for loops, if/then/else statements, or other Matlab programming constructions that we have not yet discussed in class.

The first thing you need to do is … Figure out how to create a Matlab script (i.e., a .m file). In class, we just typed in commands on the Command Line. I want you to create a .m file, type in the answers to the questions below, save it, and turn it in. You can run a script by clicking on the green arrow that looks like a “play” button.

**Q1.** It is common in psychophysics to fit a psychometric function to observed data*. Imagine that stimuli are moving dots on a computer monitor that vary in the degree to which they move coherently to the left or the right. The subjects’ task is to decide whether the dots are rightward moving or leftward moving. Coherence varies from 0%, for completely random motion with no coherence, to 100%, for all dots moving in one uniform direction.

Let $x$ be the coherence level and $\psi(x)$ be predicted probability of saying right or left.

Here is one common formalization of a psychometric function:

$$
\psi(x) = \gamma + (1 - \gamma - \lambda)F(x)
$$

$$
F(x) = 1 - \exp \left[ -\frac{x}{\alpha} \right]^{\beta}
$$

where $\gamma$ is chance performance, $\lambda$ reflects lapses even under the easiest condition, and $\alpha$ and $\beta$ reflect the shape of the psychometric function.
Later we might talk about fitting a psychometric function to data. For this assignment I just want you to specify variables for each of the parameters of the psychometric function, a variable for the value of the stimulus $x$, and produce the Matlab code needed to calculate the value of the psychometric function at that value of $x$, $\psi(x)$. I am not asking you to create a Matlab function, since we have not discussed those yet in class, I’m just asking you for the code that calculates its value (and just a single value at that). This is an exercise in simply coding up a mathematical expression in Matlab code.


**Q2.** Explore the help and documentation within Matlab.

Figure out how to express 1/3 in matlab as 1/3 rather than 0.3333 using the format command.

Figure out how to express a number with only two significant digits (more on the format command).

**Q3.** Figure out what the ellipsis (...) does in MATLAB and use it in an expression.

*Unexcused late assignments will be penalized 10% for every 24 hours late, starting from the time class ends, for a maximum of two days, after which they will earn a 0.*