Problem set 2

1. The R script `model.R` defines a function `subject()` that implements a model observer. The script `demo.R` shows how to use this function to get results from a simulated experiment.

(a) Use cross-validation to test whether `pnorm()` or `pweibull()` gives a better fit to the model observer's psychometric function. Feel free to make your own sensible choices about the details of the cross-validation, but here are some suggestions: use stimulus levels `1:5` with 20 trials at each stimulus level; divide the trials into training data (90%) and validation data (10%); use negative log likelihood as the measure of fit error. (10 marks)

(b) If you look into the script `model.R`, you will see that the psychometric function is actually generated using `pweibull()`. If you use stimulus levels `1:5` with 20 trials at each stimulus level, what is the probability that the cross-validation routine you implemented actually selects the Weibull psychometric function over the normal psychometric function? Answer this question simply by running your routine 1000 times and seeing how often it chooses the correct response. What if you have 200 trials at each stimulus level instead of 20? (2 marks)

Due date: March 24, 2020