Project 14: Probabilistic population codes for decision making

1) Implement the probabilistic population code model described in Beck et al. (2008) and reproduce the results in Figure 2.

2) Equation 7 suggests that LIP should sum MT activity (possibly with some global inhibition), but the simulations also include an urgency signal (see equations 9 and 10). What role does this urgency signal play? What happens if you remove it?

3) Discuss how this model differs from earlier evidence accumulation models (e.g., the drift-diffusion model) in terms how it treats nuisance variables.

References:

Beck, J. M., Ma, W. J., Kiani, R., Hanks, T., Churchland, A. K., Roitman, J., ... & Pouget, A. (2008). Probabilistic population codes for Bayesian decision making. *Neuron, 60*, 1142-1152.