Group 6: Project 2

1) Implement the Q-learning model of Wilson et al. (2014) and show how it simulates the effects of OFC lesions on reversal learning, delayed alternation, and extinction through alteration of the state space.

2) Reversal learning tends to get faster over repeated reversals (e.g., Dufort et al., 1954). Is this phenomenon predicted by the model? What happens if the model is trained to asymptote after each reversal (as in Dufort et al.)?

3) The model assumes that states are given. How might the model be extended to incorporate a state identification process? See for example Redish et al. (2007) and Gershman et al. (2010) [you don't need to implement these models, just briefly discuss their implications].

References:

Dufort, R. H., Guttman, N., & Kimble, G. A. (1954). One-trial discrimination reversal in the white rat. *Journal of Comparative and Physiological Psychology*, *47*, 248–249.

Gershman, S.J., Blei, D.M., & Niv, Y. (2010). Context, learning, and extinction. *Psychological Review, 117*, 197–209.

Redish, A.D., Jensen, S., Johnson, A., & Kurth-Nelson, Z. (2007). Reconciling reinforcement learning models with behavioral extinction and renewal: implications for addiction, relapse, and problem gambling. *Psychological Review, 114*, 784–805.

Wilson, R.C., Takahashi, Y.K., Schoenbaum, G., & Niv, Y. (2014). Orbitofrontal cortex as a cognitive map of task space. *Neuron, 81,* 267-279.