Introduction

What is the phenomenon you want to model? (0.5 points)

The phenomenon being modeled is the cognitive process underlying sequential decision making, specifically investigating the contrast between model-free and model based reinforcement learning strategies in a two-step task.

Why is that phenomenon relevant for understanding human cognition? (0.5 points)

It shows the mechanisms behind decision making, such as learning from reward and internal models of tasks.

Methods

Why is this modeling method appropriate for understanding the phenomenon? (1 point)

Reinforcement learning is appropriate because the tasks spans several timesteps and the user is rewarded based on their behavior. Using a model-free method implies decision making in this kind of task is habitual, whereas using a model-based method implies that decision making is strategic.

Which hypothesis/hypotheses do you seek to test by contrasting two (or more) models? (1 points)

* model-free vs. model-based

**Description of computational model(s)**

What are the inputs, system properties, and outputs of your model(s)? (1 point)

The inputs are the tokens available for the user to choose from.

The system properties are the parameters (learning rate, discount factor, temperature), state values?, transition probabilities?

The outputs are the tokens that the user chooses.

Which assumptions does each model make? (1 point)

Describe the computational implementation of each model (e.g., model formulas) (1 point)

**Description of the experiment**

Provide an overview of the experiment. What are the independent variables and dependent variables of the experiment? (0.5 points)

How much data were collected (number of participants and trials)? (0.5 points)

**Model simulation**

Describe the process of simulating data from the model(s). (1 point)

**Model fitting**

Describe the process of fitting the model(s) to the data. Remember to describe any preprocessing steps of the data. (2 points)

**Parameter recovery**

Describe how you performed parameter recovery for your models. (1 points)

**Model comparison (& recovery)**

Describe how you compared the models. (1 point)

Optional: Describe how you performed model recovery. (0.5 bonus points)