

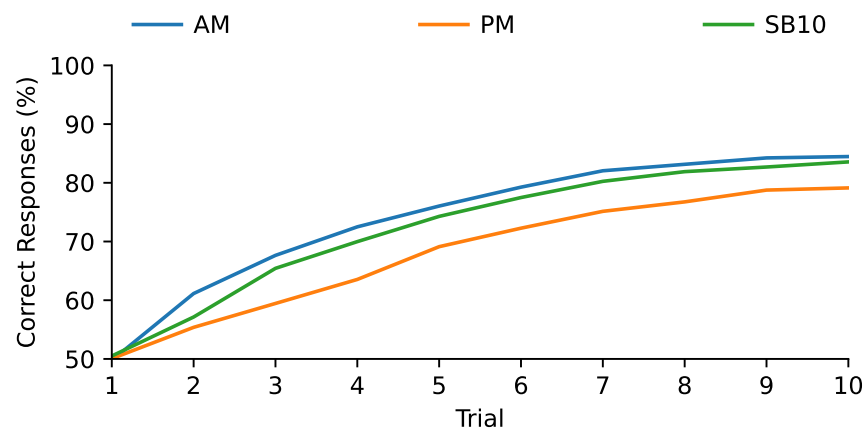
Exercise 3

In this exercise, you will implement the three different decision-making strategies for the Kalman filter. File `TEMPLATE_EXERCISE3.IPYNB` in Ilias provides a template for this exercise. Please submit your completed exercise as an `.IPYNB` file via Ilias until 09/05/2023.

Exercise 3.1

Implement the accuracy maximization, probability matching and sample-based decision-making strategies for the Kalman filter as discussed in the lecture. Run each model and plot their probability of making a correct choice over trials (averaged over multiple tasks).

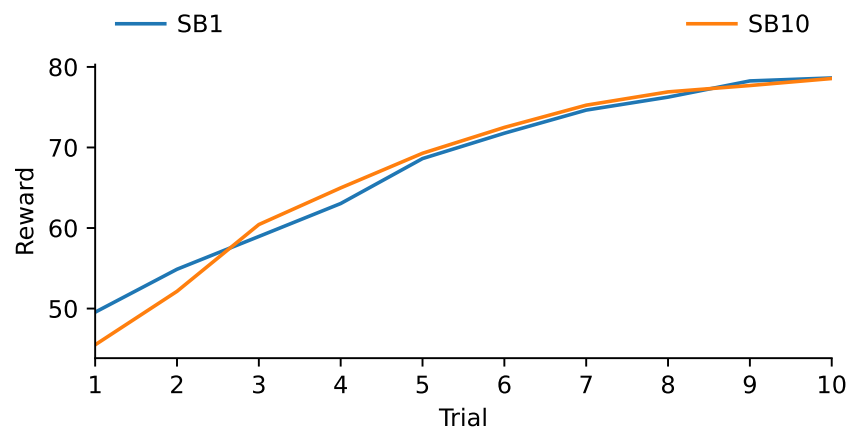
The resulting plot should look something like this:



Exercise 3.2

Let us now assume that making a correct decision incurs in a reward of 100, but drawing samples is costly. Plot the resulting reward function for the sample-based agent with $K \in \{1, 10\}$ samples over trials (averaged over multiple tasks) for a cost of 0.25 per drawn sample.

The resulting plot should look something like this:



Exercise 3.3

Could it make sense to use a sampled-based decision-making rule with an adaptive number of samples (i.e., the number of drawn samples in early trials differs from the number of drawn samples in later trials)? Provide an argument for or against this idea.