Project 18: Representational drift

1) Implement the model of representational drift in Ratzon et al. (2024) and reproduce the rate map plots shown in Figure 2. Discuss how this relates to the experimental data analyzed in the paper.

2) The authors argue that noise is the cause of sparsification (at least for gradient descent). Test this by reducing the update noise in Eq. 4.

3) What are some possible biological mechanisms underlying update noise? See Ribrault et al. (2011) for some ideas.

References:

Ratzon, A., Derdikman, D., & Barak, O. (2024). Representational drift as a result of implicit regularization. *Elife*, *12*, RP90069.

Ribrault, C., Sekimoto, K., & Triller, A. (2011). From the stochasticity of molecular processes to the variability of synaptic transmission. *Nature Reviews Neuroscience, 12*, 375-387.