

Exercise 1:

What I remember is:

One question on what a proper readout function looks like $x^T W x$

One question on which of 4 example functions $f(x,y)$ are invariant under rotation

One question on how you can train alternative contrastive learning if you don't do the normal contrasting to negatives

Other questions were rather easy which is why I don't remember them.

Exercise 2:

SimCLR loss

- a) derivative w.r.t. z_i of sum over i of $\exp(z_i^T z_j / \tau)$
- b) computing derivative of the whole loss with an intermediate step given and the solution given
- c) explaining the somewhat simplified negative derivative of the loss (points from epicenter of negatives to the view z_j) and explaining temperature τ
- d) explaining triplet loss

Exercise 3:

ELBO

- a) computing $p(z, x)$ given $p(x|z)$ and $p(z)$
- b) computing $p(x)$ with integral
- c) deriving ELBO from D_{kl}
- d) computing the ELBO for the example with given p and given q

Exercise 4: Programming

Message Passing

- a) define function that computes pairwise distances of 3d points (2 lines like in hw)
- b) define function that computes the messages using broadcasting and summing over the right dimension (=1)
- c) define function for the updating
- d) put the whole implementation together (this exercise I skipped in the last few minutes so I can't further explain)

Exercise 5: alternative attention using approximation (didn't do can't describe further time was up 😞)