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# Question 1

# Question 2

In the case of a deepsets architecture, there are no message passing layers as elements of a set have no neighbors. Also, after the readout passage, graphs and sets are represented by a single vector. In the case of sets, a MLP transforms each vector into a scalar, whereas in the case of the GNN described in Lab6, the MLP transforms a sequence of vectors into classes. There is no difference between a set and a graph without edges. On the other hand with Deepsets sets are processed one by one whereas with GNN graphs are processed by batches.

# Question 3

The SR-GNN uses an embedding layer to map the nodes of the session graphs into a vector space and not a fully-connected layer because a fully connected layer produces vectors that contain information about all the nodes of the session graphs. This is something we want to avoid. Indeed we want that given a context vector, the probabilities of a given node $v_i$ appearing next in the recommendations depend of a context vector representing the session, and $v_i$. This is why a scalar product between the embedding of $v_i$ and the context vector is done. With a fully connected layer we do not have access to information of $v_i$ seperately from the other nodes.

# Question 4

It would not be a good idea to apply Deepsets on the problem of predicting the next item because there is a graph structure on the session. The order of elements matter in recommendation models whereas Deepset models need to be invariant to permutation.