Homework 6: Deep Learning

Out June 6; Due June 12, 12 a.m.

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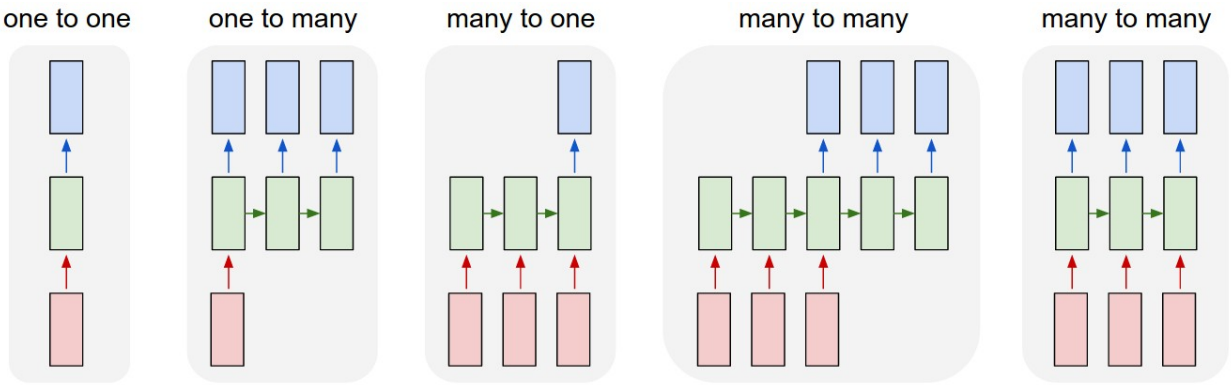
RNNs.

Although RNNs are used for sequential data, there are different types of applications. Andrej Karpathy[1] described the different modalities using the following diagram:



In this case, **one-to-one** describes a standard non-recurrent NN that would normally be used for tasks such as classification.

A **one-to-many** describes the process of creating sequences from a fixed source. An application of this model is creating a text description from an image. In **many-to-one**, we have a sequence and want a fixed element. This can be used in sentiment analysis. The **many-to-many-left** case, receives and produces sequences. An example of this scenario is neural machine translation (NMT). Here, the input and output sequences can have different lengths. In contrast, the **many-to-many-right** case, receives and produces sequences that are aligned. In this case, the input and output are fixed. This can be used in image segmentation or video classification.

Your homework, is to pick one of the four RNN modalities previously described and present an application during the exercise session. Submit either a PDF, PDF slides, or a Jupyter notebook with your presentation.

[1] https://karpathy.github.io/2015/05/21/rnn-effectiveness/