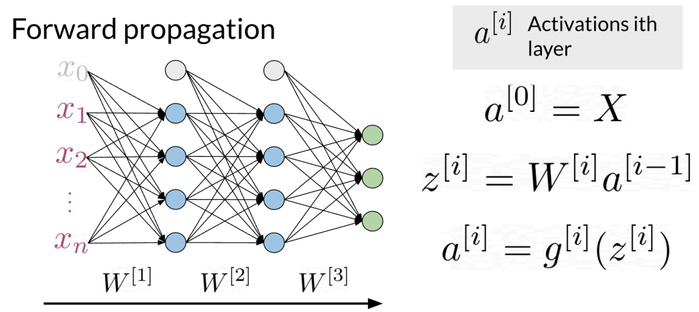
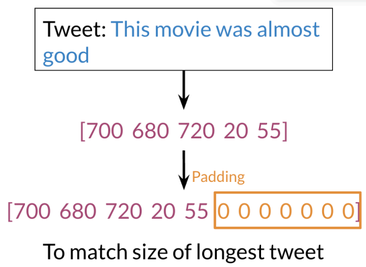
Neural Networks for Sentiment Analysis

Previously in the course you did sentiment analysis with logistic regression and naive Bayes. Those models were in a sense more naive, and are not able to catch the sentiment off a tweet like: *"I am not happy "* or *"If only it was a good day"*. When using a neural network to predict the sentiment of a sentence, you can use the following. Note that the image below has three outputs, in this case you might want to predict, "positive", "neutral ", or "negative".



Note that the network above has three layers. To go from one layer to another you can use a W matrix to propagate to the next layer. Hence, we call this concept of going from the input until the final layer, forward propagation. To represent a tweet, you can use the following:

Word	Number
a	1
able	2
about	3
...	...
hand	615
...	...
happy	621
...	...
zebra	1000



Note, that we add zeros for padding to match the size of the longest tweet.

A neural network in the setup you can see above can only process one such tweet at a time. In order to make training more efficient (faster) you want to process many tweets in parallel. You achieve this by putting many tweets together into a matrix and then passing this matrix (rather than individual tweets) through the neural network. Then the neural network can perform its computations on all tweets at the same time.

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