

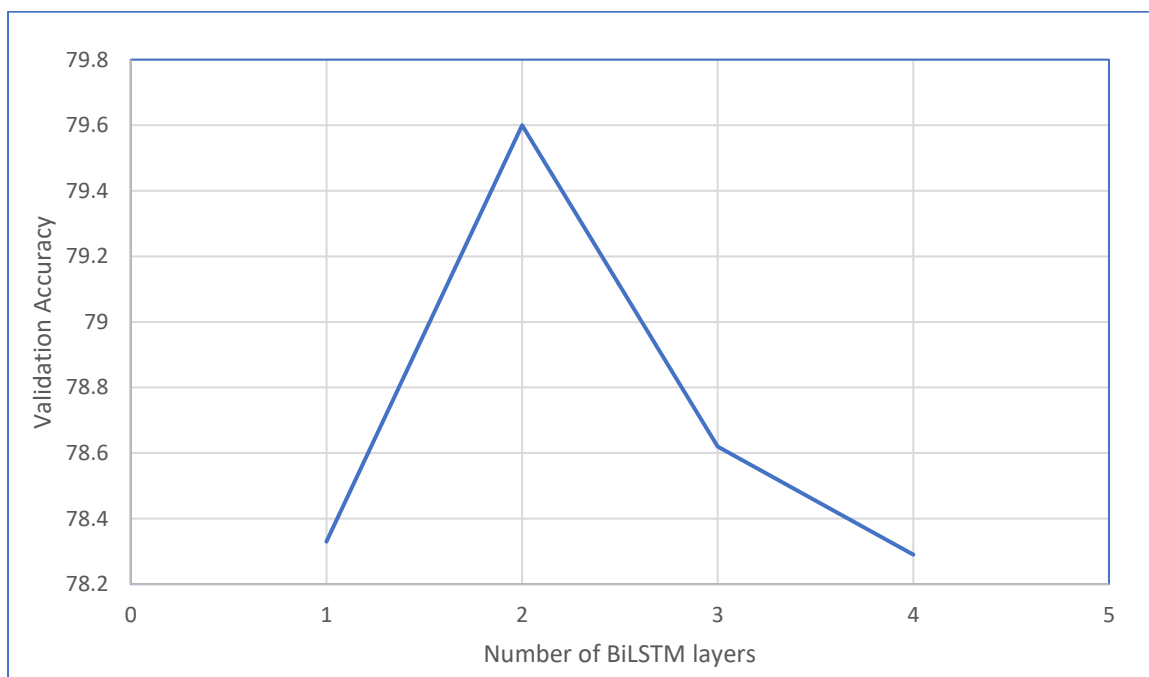
# Natural Language Inference on SNLI Dataset

I decided to go with a model with an embedding layer followed by a linear translation layer and then two layers of bi-directional LSTM. After passing the premise and hypothesis through these layers, they were concatenated and then passed through 5 dense layers with dropout.

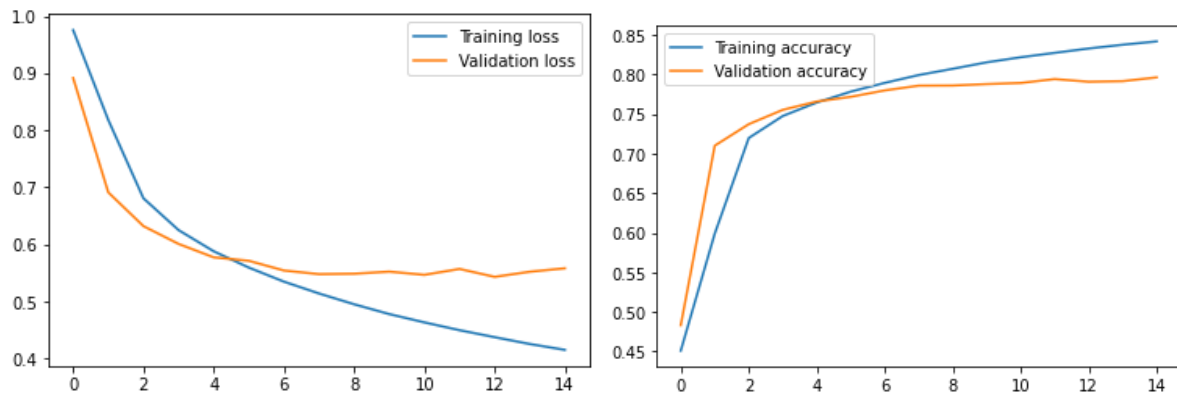
In the model I chose, using Bidirectional LSTMs are very important. In the chosen number of epochs (15) a model with Non- Bidirectional LSTMs showed no learning with accuracy stagnating in and around 33%

	Validation accuracy
BiLSTM	79.60
LSTM	~33% (NOT LEARNING)

I tried using various number of layers for BiLSTM, and found that accuracy peaked at a 2 layered model.



The model only had to be trained for 15 epochs after which it started to overfit/plateau.



# Probe

I constructed a POS probe to analyse the model. It took the output from the different internal layers of the inference model, passed it through a dense neural net to predict the POS tag of the words given as input.

To extract the POS tags from the dataset I iterated over the sentences given in the parsed tree format. And tokenized both the words and the tags before passing it through the aforementioned model.

I carried out probing on 3 different models I had tried while training for inference so as to analyse the difference and understand how the model calculates and interprets English language

	Validation Accuracy	Validation Loss
Embedding Layer	68.13	1.977
Translation Layer	64.85	2.216
2 layered BiLSTM Layer	83.40	1.504

	Validation Accuracy	Validation Loss
2 layered BiLSTM	83.40	1.504
1 layered BiLSTM	83.26	1.533
4 layered BiLSTM	83.40	1.504
2 layered LSTM		