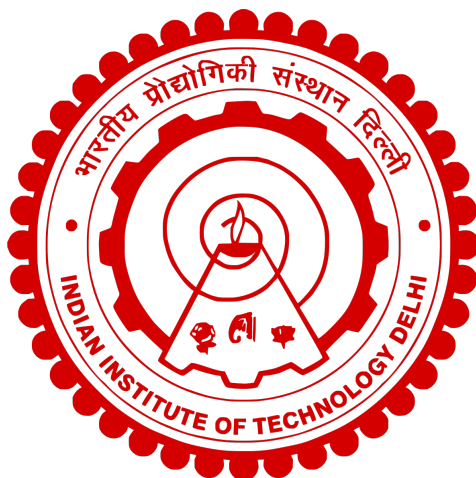


# Indian Institute of Technology Delhi



COL 774 - Machine Learning

## Assignment 4

Transforming Hand-written images to  $\text{\LaTeX}$  Equations

GARV NAGORI, ARYAN SHARMA  
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## §1 Non-competitive subpart

In this part, we use a CNN Encoder to encode the image data into a context vector of appropriate length. We then use a LSTM model to generate data using the context vector given by the CNN and the previously generated token.

Teacher forcing was used to help the LSTM run faster. It was used with 50% probability to take it's own generated token or to use the token in the actual data.

The data used was Synthetic Training Set to train the models since there are not many Handwritten Data. Then the performance was measured on the validation set of both Synthetic and Handrwritten Datasets.

The loss curve for this part of training is as shown.

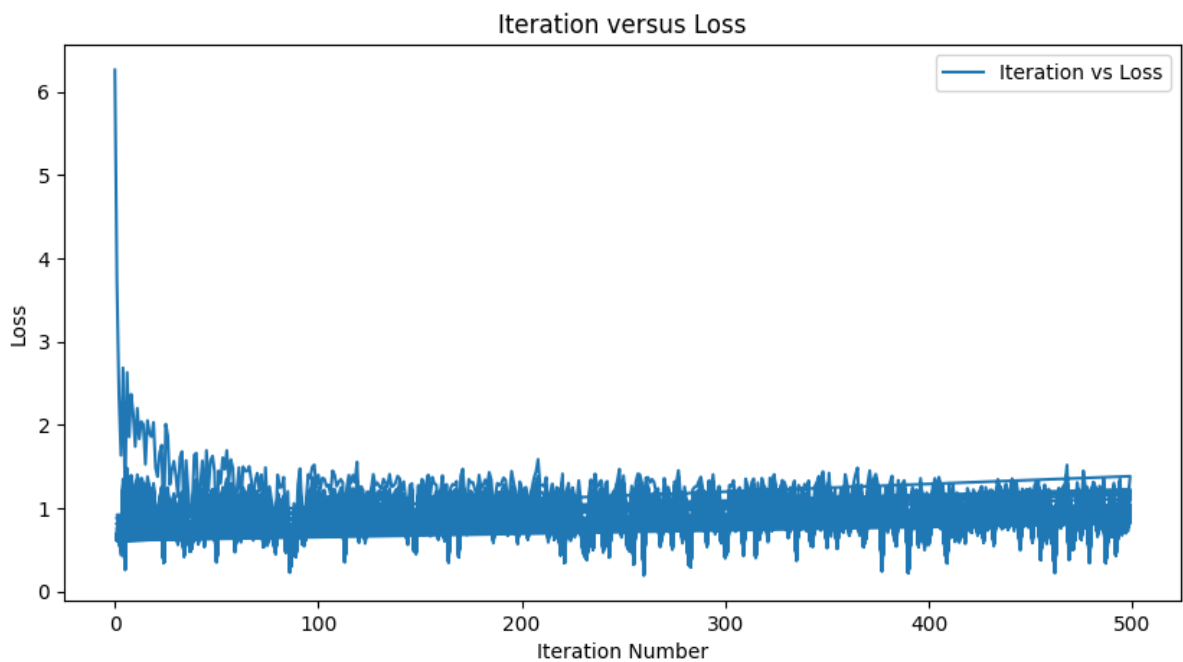


Figure 1: Loss vs Number of Iterations

The BLEU scores on the datasets are given below:

Data	Dataset	BLEU Score
Synthetic Data	Validation Set	0.76
	Testing Set	0.45
Handwritten Data	Validation Set	0.24

Table 1: Caption

We then used the Handwritten Training Dataset to fine-tune the model further so that it can predict more accurately on Handwritten images and not just Synthetic images.

The BLEU scores for this is given below:

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## §2 Competitive subpart

## §3 Acknowledgements

We have used the style file from here<sup>1</sup> to produce this document.

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<sup>1</sup><https://github.com/vEnhance/dotfiles/blob/main/texmf/tex/latex/evan/evan.sty>