

NLP Assignment-3 Report

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RNN Model Report

i) Hyperparameters:

- Max Sequence Length: 50
- Batch Size: 30
- Number of Hidden Units: 10
- Number of Layers: 3
- Dropout Rate: 0.3
- Number of Output Units: 4
- Epoch Count: 100

ii) Data Specification:

- Mean Sentence Length: 26.0216
- Median Sentence Length: 26.0
- Min Sentence Length: 9
- Max Sentence Length: 97

iii) Justification for Hyperparameters:

The choice of hyperparameters was influenced by the characteristics of the data. With a mean/median sentence length around 25 and a maximum length of 97, a max sequence length of 50 was selected to accommodate the majority of sentences without excessively increasing computational complexity.

iv) Model Architecture:

- Input Layer: Embedding layer
- Hidden Layers: 3 layers of RNN with 10 hidden units each.
- Embedding dimension: 100
- Output Layer: Dense layer with 4 output units.

v) Training Details:

- Training Duration: 100 epochs (based on validation set)
- Optimizer: Adam
- Learning rate: 0.01
- Loss Function: Cross Entropy

vi) Performance:

- Accuracy: 0.682
- F1 Score: 0.6771654547858635
- Confusion Matrix:

	Predicted Class 0	Predicted Class 1	Predicted Class 2	Predicted Class 3
True Class 0	95	18	6	6
True Class 1	9	105	1	10
True Class 2	20	12	65	28
True Class 3	10	29	10	76

- Classification Report:

	precision	recall	f1-score	support
0	0.71	0.76	0.73	125
1	0.64	0.84	0.73	125
2	0.79	0.52	0.63	125
3	0.63	0.61	0.62	125
accuracy		0.68		500

macro avg	0.69	0.68	0.68	500
weighted avg	0.69	0.68	0.68	500

