BiLSTM Tagger Report

Model Description

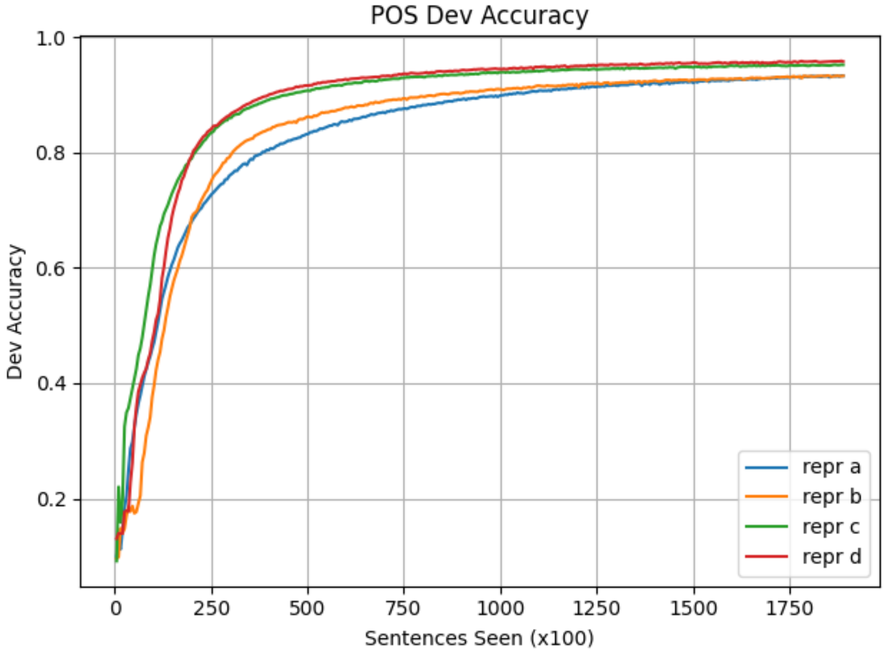
We implemented a 2-layer BiLSTM-based sequence tagger to predict linguistic labels (POS or NER) over input sequences. The model includes the following architecture:

- **Embedding Layer**: Word-level embeddings of 30 dimensions.
- **Optional Character/Subword Embeddings**:
  - **(b)** Char-BiLSTM over character embeddings (dim 15), followed by a bidirectional LSTM.
  - **(c)** Sum of word, prefix, and suffix embeddings (dim 30).
  - **(d)** Concatenation of (a) and (b) passed through a projection layer.
- **Two BiLSTM layers**: Each with 50 hidden units per direction.
- **Dropout**: 0.3 after the second BiLSTM.
- **Classifier**: Linear layer over the BiLSTM output.
- **Loss**: CrossEntropyLoss with ignore_index=-100 for padding.
- **Optimizer**: Adam, learning rate=0.001.

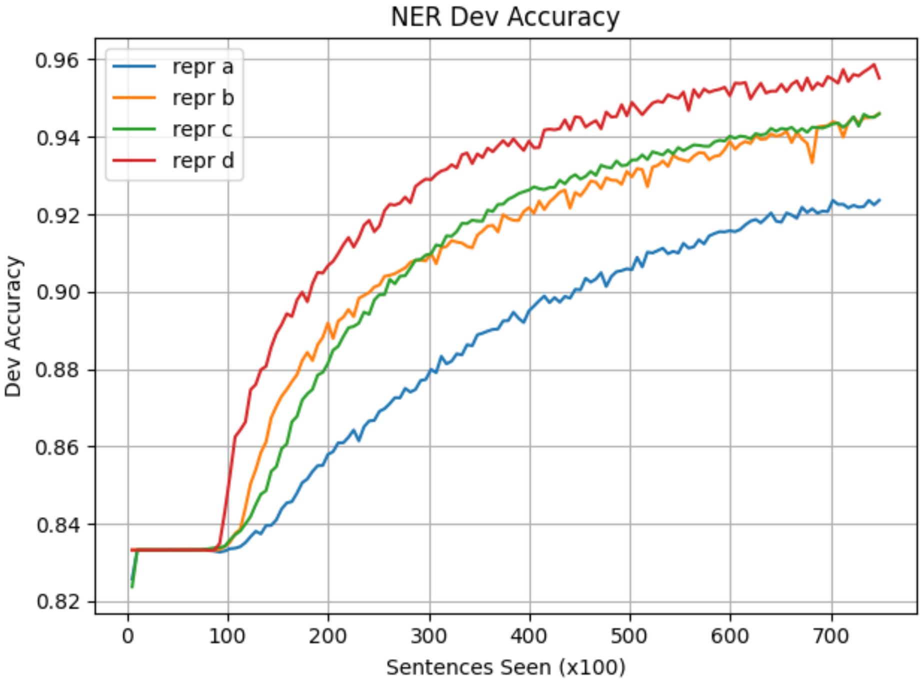
Training was done for 5 epochs with batch size 64.

Graphs

POS Dev Accuracy



NER Dev Accuracy



The x-axis shows the number of sentences seen (in hundreds), and the y-axis shows the dev accuracy. Every 500 sentences, dev accuracy was evaluated.

Best Model Selection

Based on the dev accuracy curves:

- **Best POS model**: Representation **d** with final dev accuracy **0.9591**
- **Best NER model**: Representation **d** with final dev accuracy **0.9587**

Final Predictions

The following models were used to generate the final test predictions:

```
python bilstmPredict.py d model_pos_d.pt pos/test > test4.pos
python bilstmPredict.py d model_ner_d.pt ner/test > test4.ner
```

These predictions are saved in `test4.pos` and `test4.ner` respectively.

Notes

- The model files (`*.pt`) and accuracy logs (`*.pt.accuracies.csv`) are saved and used to track training progress.
- Evaluation was computed on dev set only, blind test accuracy is not available.