Week 7–8 Progress Report: Neural Confidence Journal

Model Performance Summary

During Weeks 7–8, the DistilBERT model was trained and evaluated on the confidence classification task (Low, Neutral, High). Below are the validation metrics at epoch 6:

Validation Loss: 1.039

Accuracy: 0.700

Precision (Macro): 0.722

Recall (Macro): 0.667

F1 Score (Macro): 0.667

Runtime (seconds): 0.3685

Samples per second: 27.139

Steps per second: 8.142

Epoch Metrics Table

The following screenshot shows the epoch-by-epoch performance:

Epoch	Training Loss	Validation Loss	Accuracy	Precision Macro	Recall Macro	F1 Macro
1	No log	1.078815	0.300000	0.250000	0.305556	0.232323
2	No log	1.058221	0.600000	0.716667	0.583333	0.583333
3	No log	1.039381	0.700000	0.722222	0.666667	0.666667
4	1.056500	1.024591	0.700000	0.722222	0.666667	0.666667
5	1.056500	1.014424	0.700000	0.722222	0.666667	0.666667
6	1.056500	1.010158	0.700000	0.722222	0.666667	0.666667

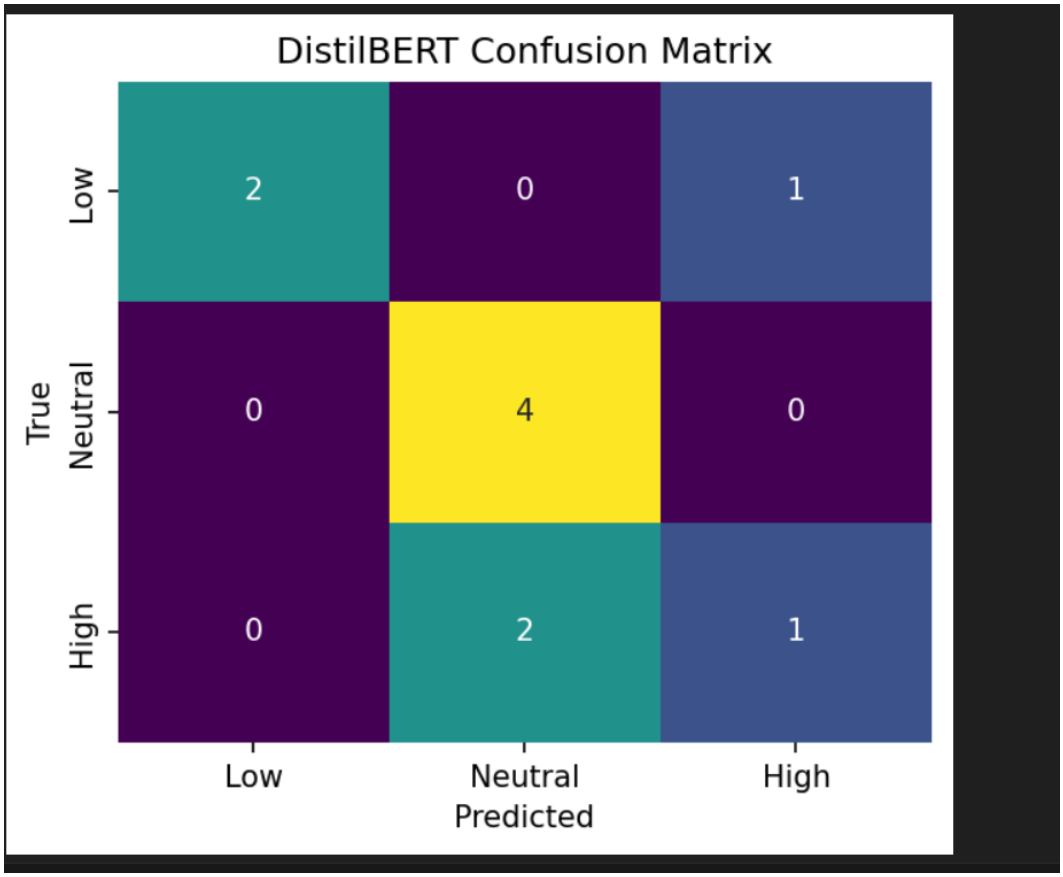
Classification Report

The classification report indicates strong precision in the Low and Neutral classes, but the High class remains more difficult for the model to identify due to limited data or overlapping linguistic features.

```
              precision    recall  f1-score   support

         Low      1.000     0.667     0.800         3
     Neutral      0.667     1.000     0.800         4
        High      0.500     0.333     0.400         3

    accuracy                          0.700        10
   macro avg      0.722     0.667     0.667        10
eighted avg      0.717     0.700     0.680        10

aved figure: week7-8_distilbert\confusion_matrix_distilbert.png
aved predictions: week7-8_distilbert\val_predictions_distilbert.csv
```

Confusion Matrix

Below is the confusion matrix showing how the model performed on each confidence level:



Interpretation

The model identifies Neutral confidence very well (4/4 correct). Low confidence is also reasonably well detected, though some predictions are confused with High. High confidence remains the most challenging, resulting in only 1 correct prediction out of 3.

Overall, the model reaches 70% accuracy and shows balanced macro metrics, which indicates stable learning and useful predictive ability despite a small dataset.

Next Steps (Week 9–10 Preview)

- Expand the dataset to improve High-confidence detection.
- Experiment with class weighting or focal loss.
- Add trend visualization tools for journal confidence tracking.
- Continue refinement before final analysis and presentation.