



Training BERTimbau

Stance Classification Model

BERTimbau



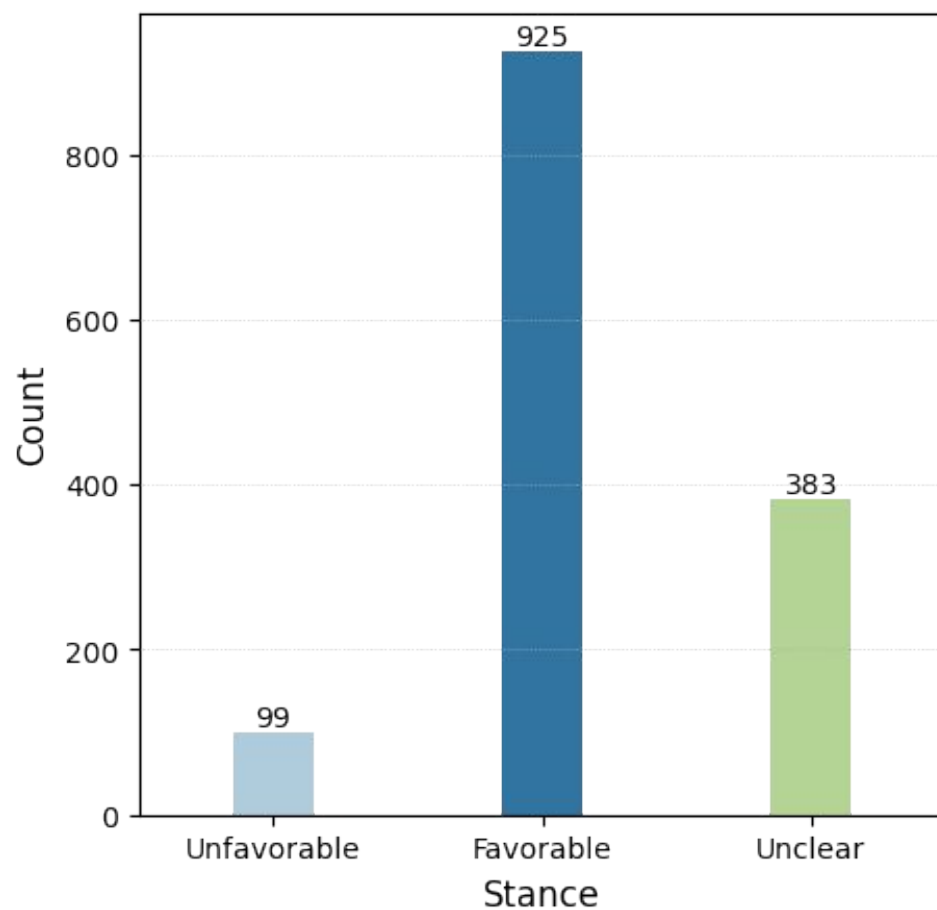
BERT-BASE-PORTUGUESE-CASED

- pre trained in brazilian portuguese
- sentence textual similarity
- recognizing textual entailment
- name entity recognition

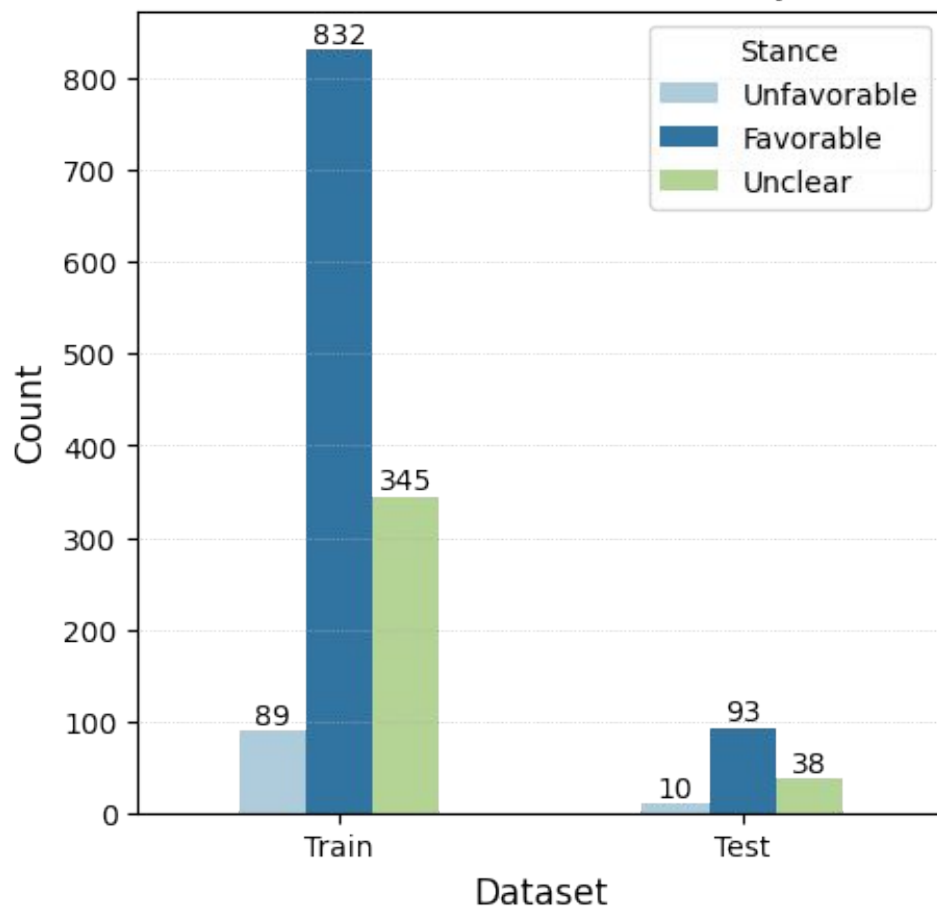
– 9:1 TRAIN/TEST SPLIT –

PREPARING THE DATA...

Class Distribution - Whole Dataset



Class Distribution - Train/Test Sets



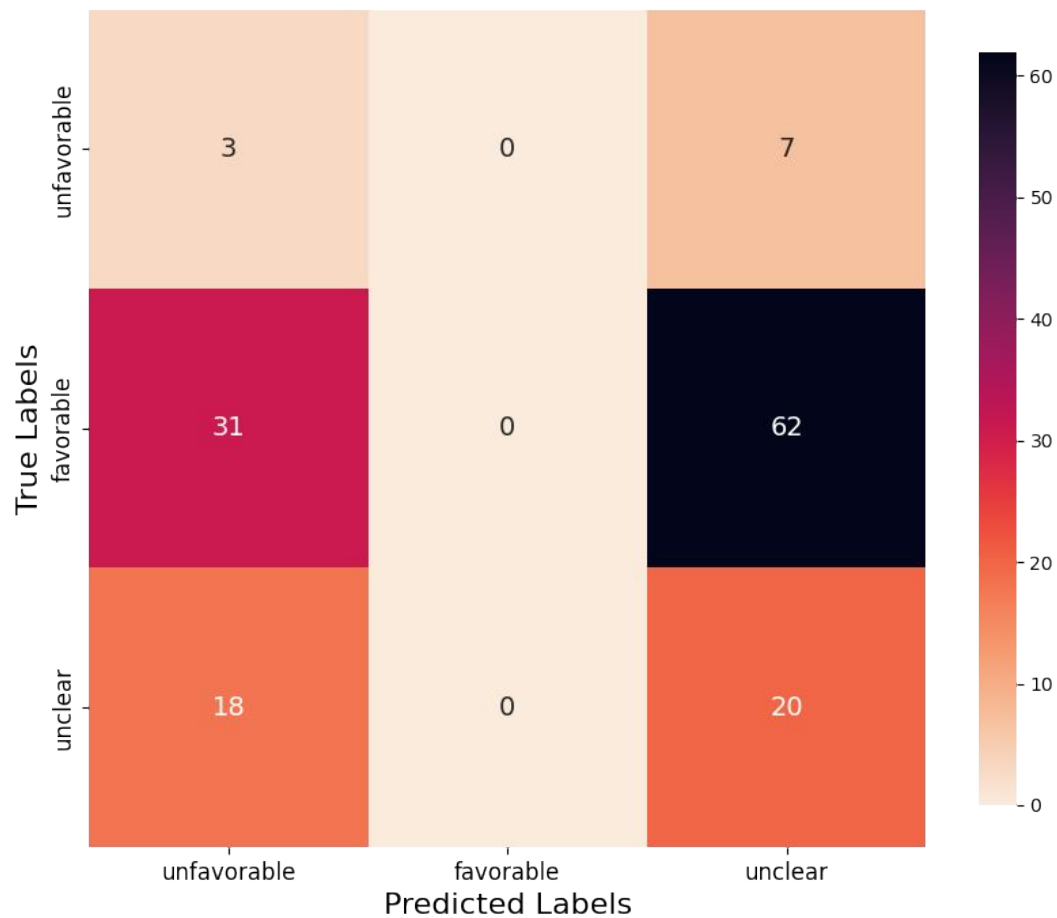
TEST BERTimbau...

BERTimbau Performance Before Fine-Tuning

	precision	recall	f1-score	support
0	0.06	0.3	0.1	10.0
1	0.0	0.0	0.0	93.0
2	0.22	0.53	0.31	38.0
macro avg	0.09	0.28	0.14	141.0
weighted avg	0.06	0.16	0.09	141.0

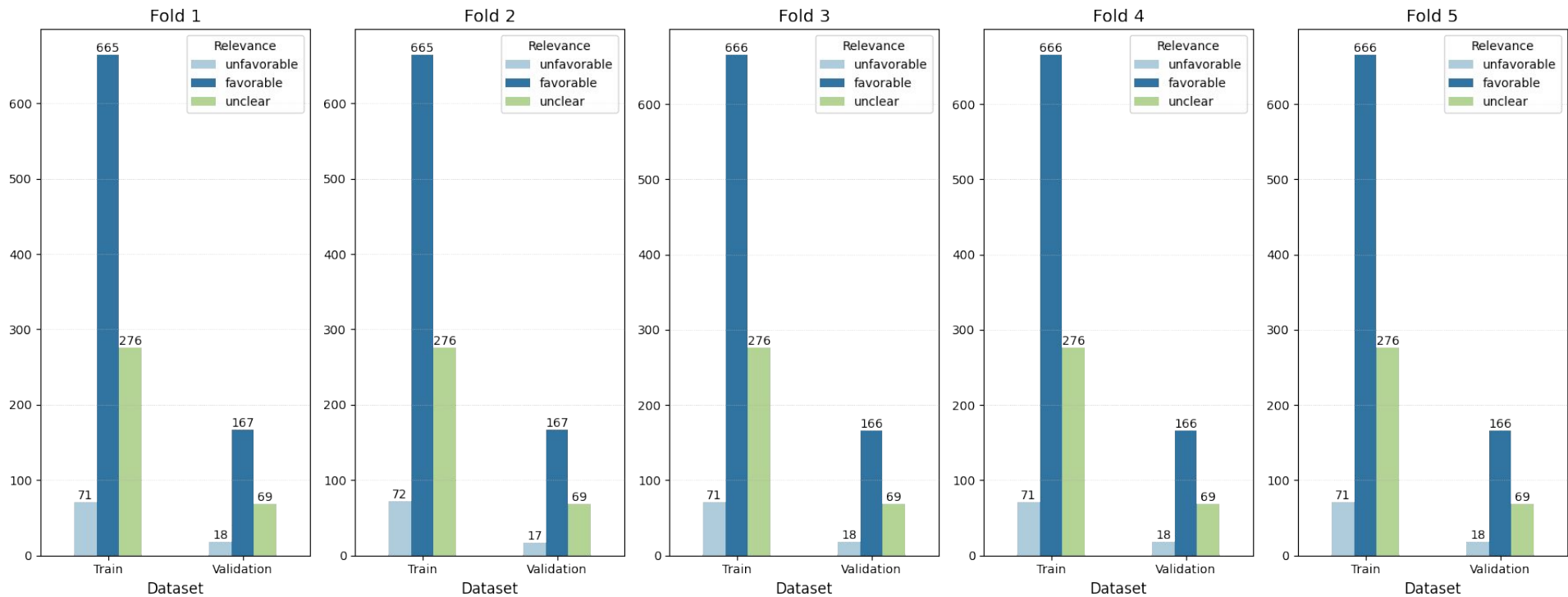
Overall Accuracy: 0.16

BERTimbau Performance Before Fine-Tuning

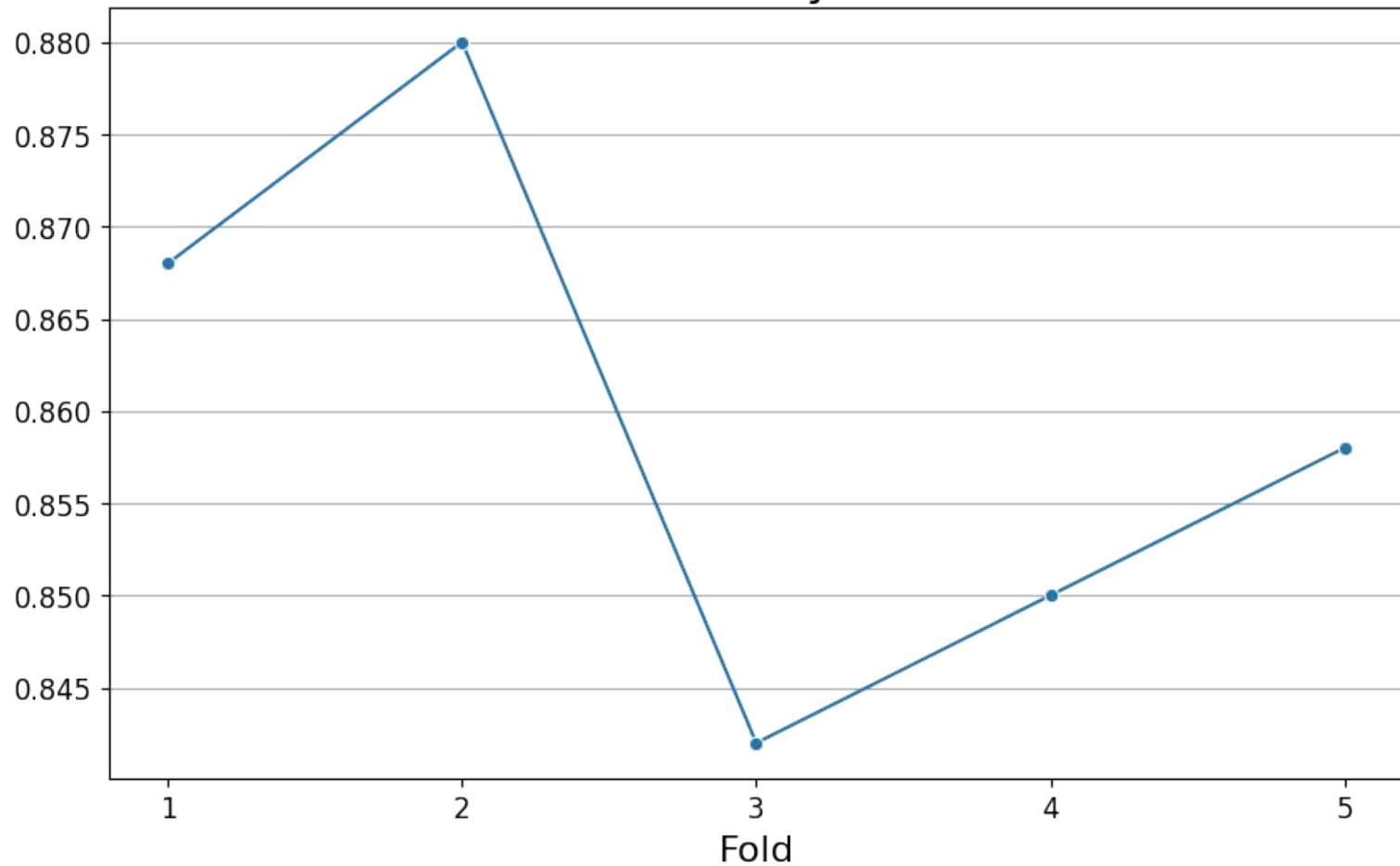


FINE TUNING...

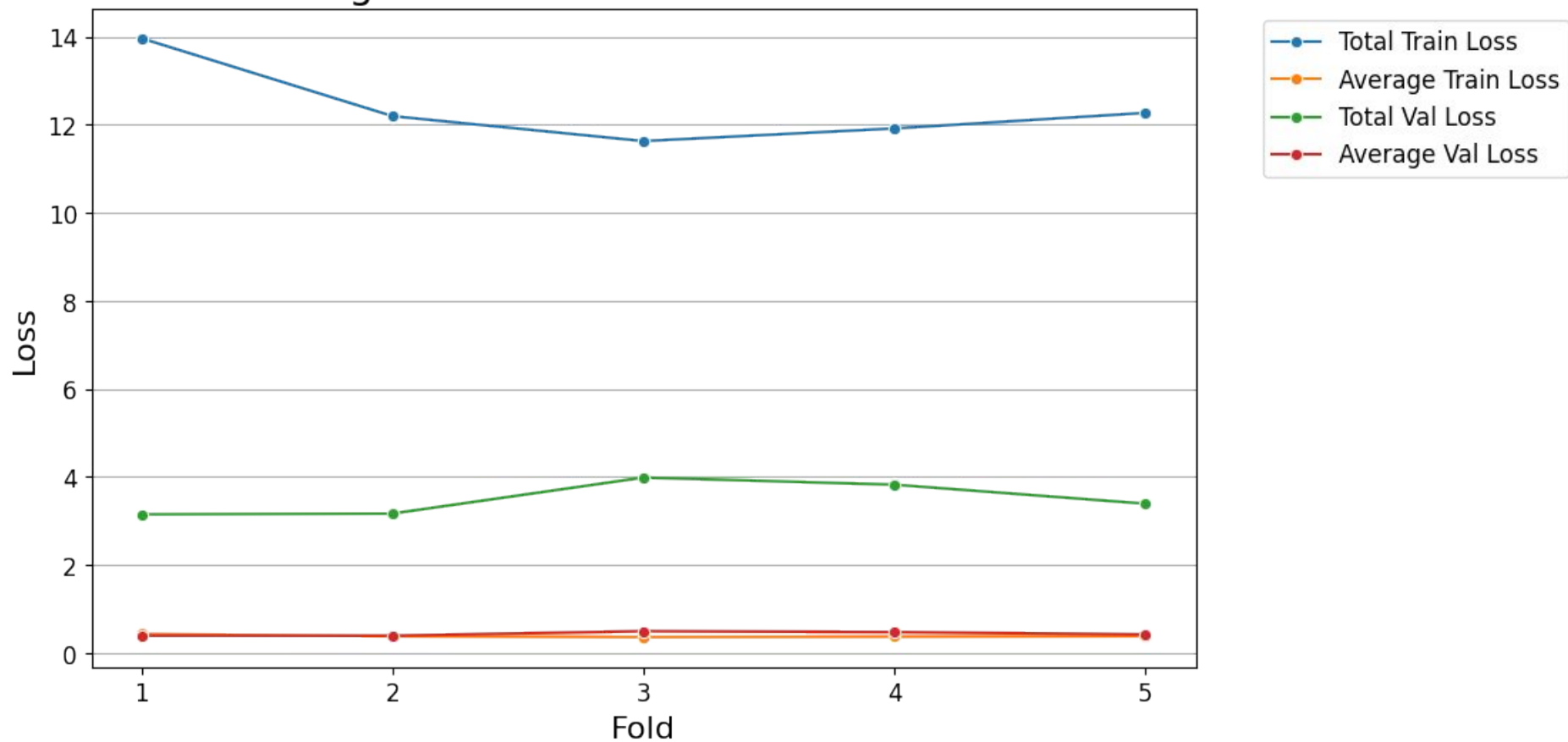
Class Distributions Across Folds



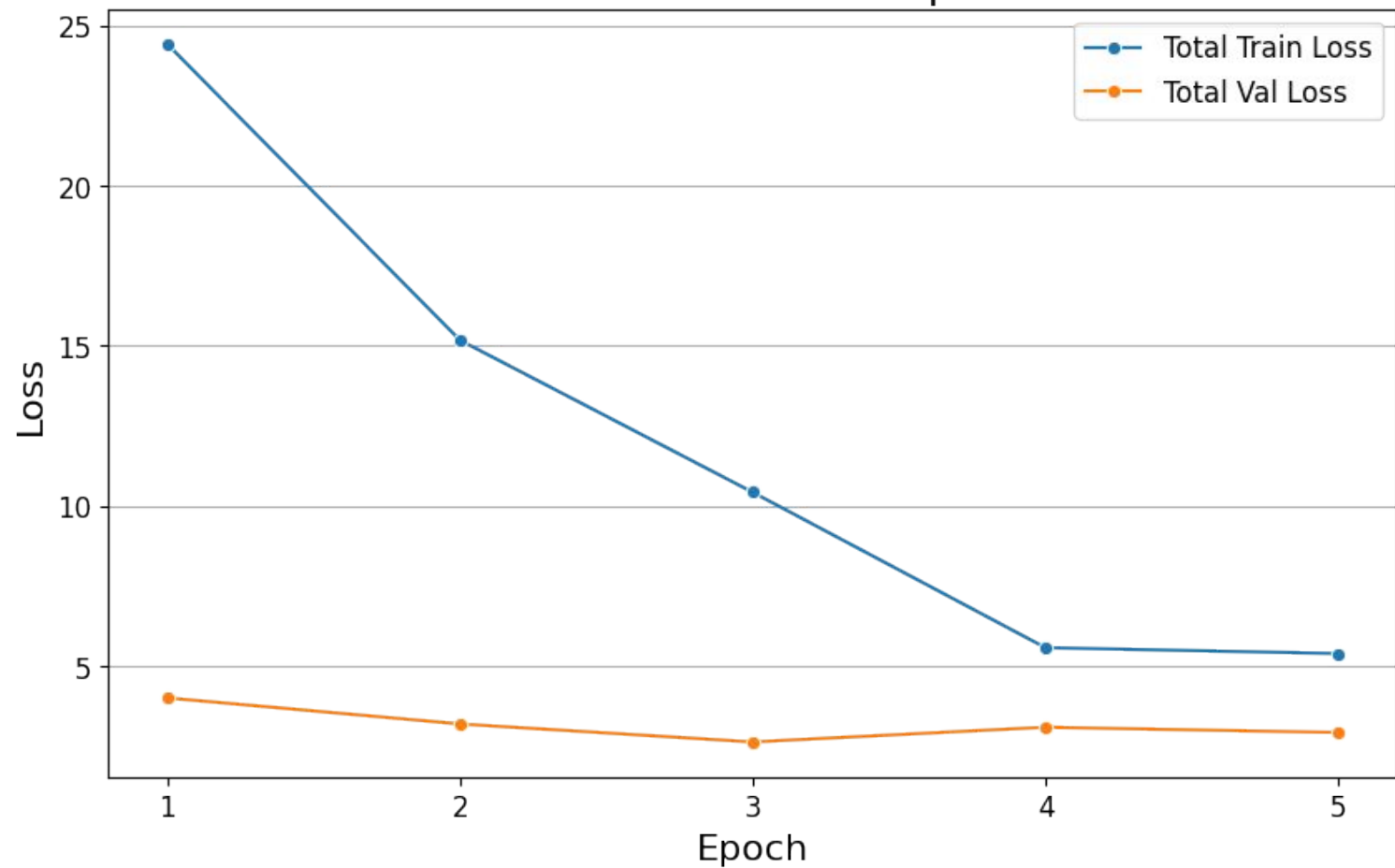
Validation Accuracy Across Folds



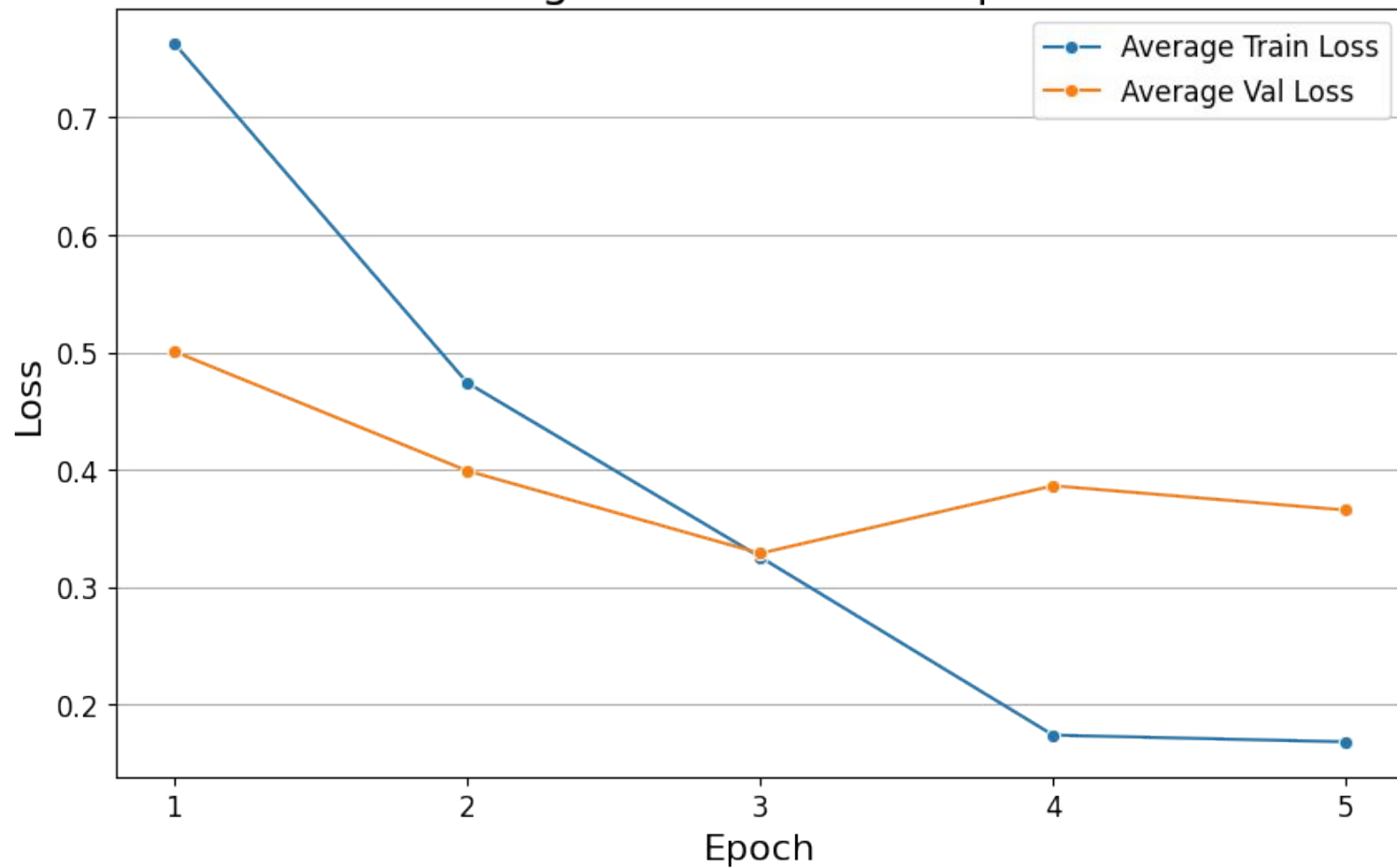
Training and Validation Losses Across Folds



Total Losses Across Epochs



Average Losses Across Epochs



TEST NEW MODEL...

BERTimbau Performance After Fine-Tuning

	precision	recall	f1-score	support
0	1.0	0.5	0.67	10.0
1	0.92	0.97	0.94	93.0
2	0.89	0.89	0.89	38.0
macro avg	0.94	0.79	0.83	141.0
weighted avg	0.92	0.91	0.91	141.0

Overall Accuracy: 0.91

BERTimbau Performance Before Fine-Tuning

	precision	recall	f1-score	support
0	0.06	0.3	0.1	10.0
1	0.0	0.0	0.0	93.0
2	0.22	0.53	0.31	38.0
macro avg	0.09	0.28	0.14	141.0
weighted avg	0.06	0.16	0.09	141.0

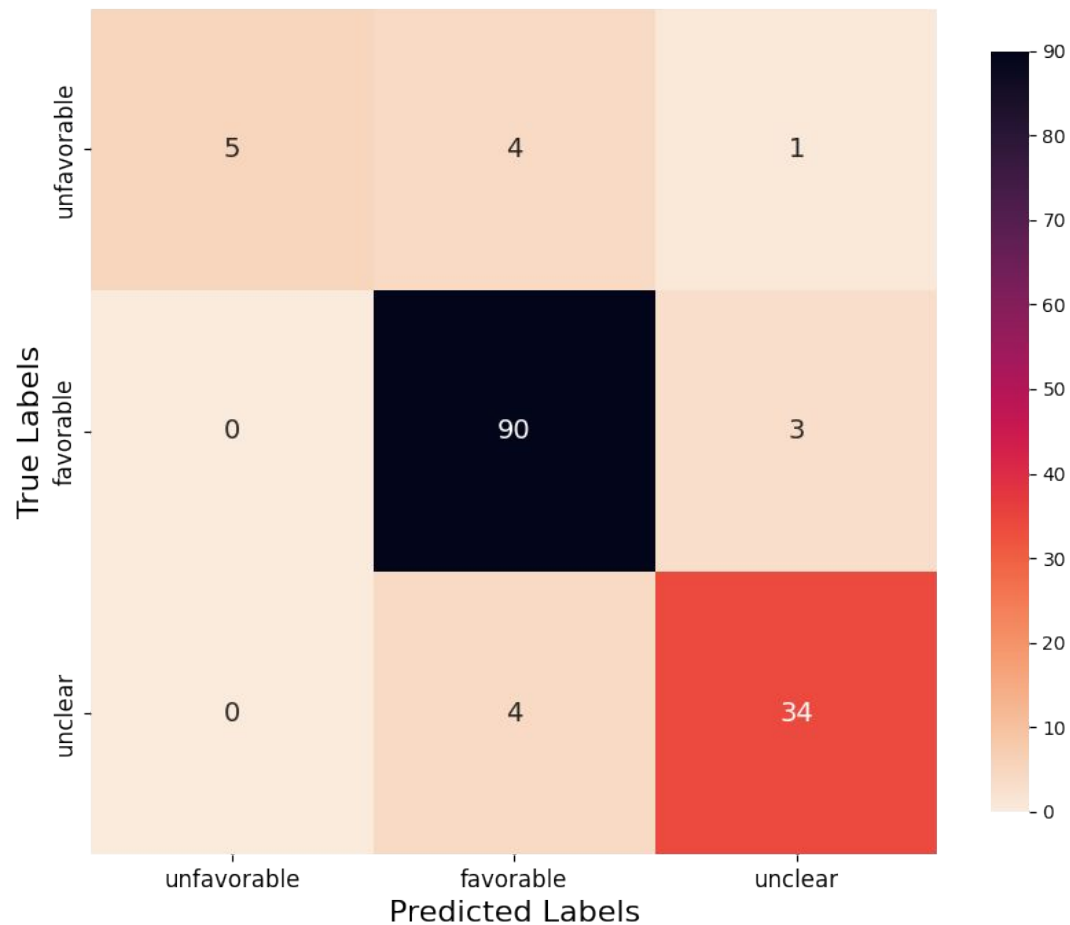
Overall Accuracy: 0.16

BERTimbau Performance After Fine-Tuning

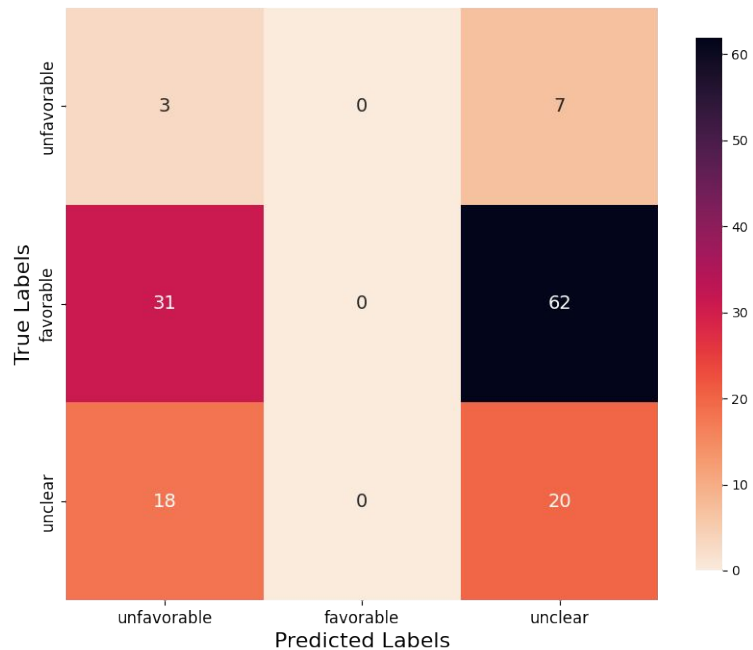
	precision	recall	f1-score	support
0	1.0	0.5	0.67	10.0
1	0.92	0.97	0.94	93.0
2	0.89	0.89	0.89	38.0
macro avg	0.94	0.79	0.83	141.0
weighted avg	0.92	0.91	0.91	141.0

Overall Accuracy: 0.91

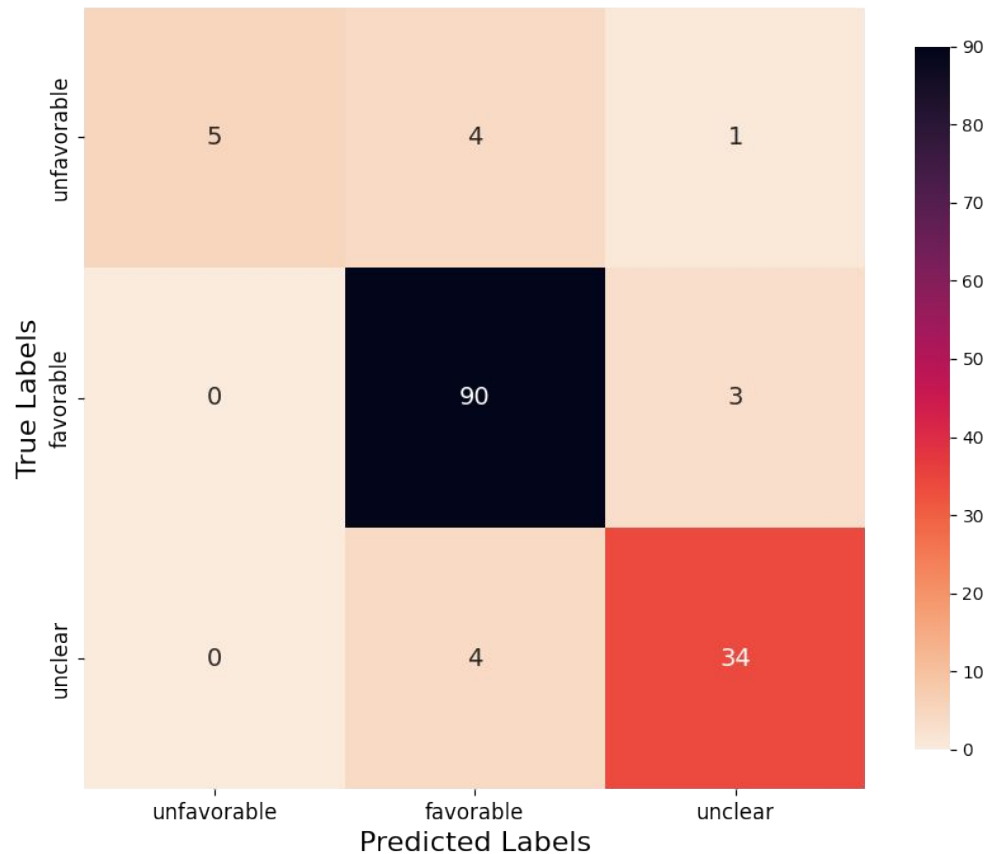
BERTimbau Performance After Fine-Tuning



BERTimbau Performance Before Fine-Tuning



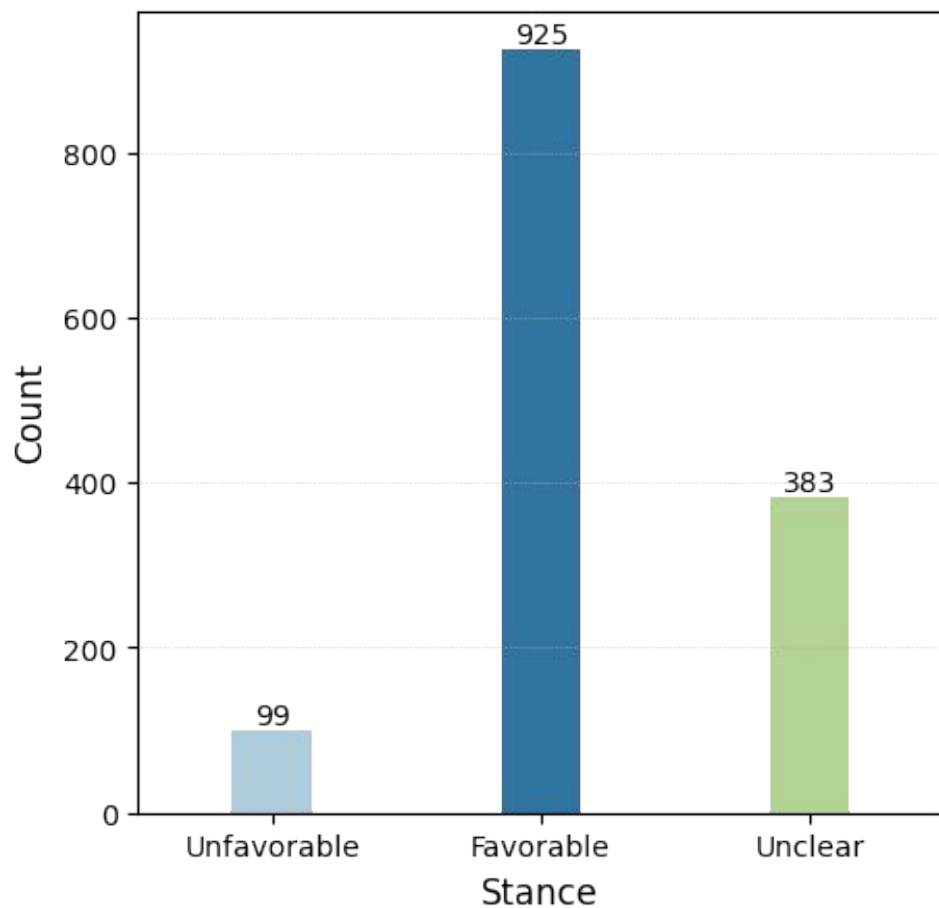
BERTimbau Performance After Fine-Tuning



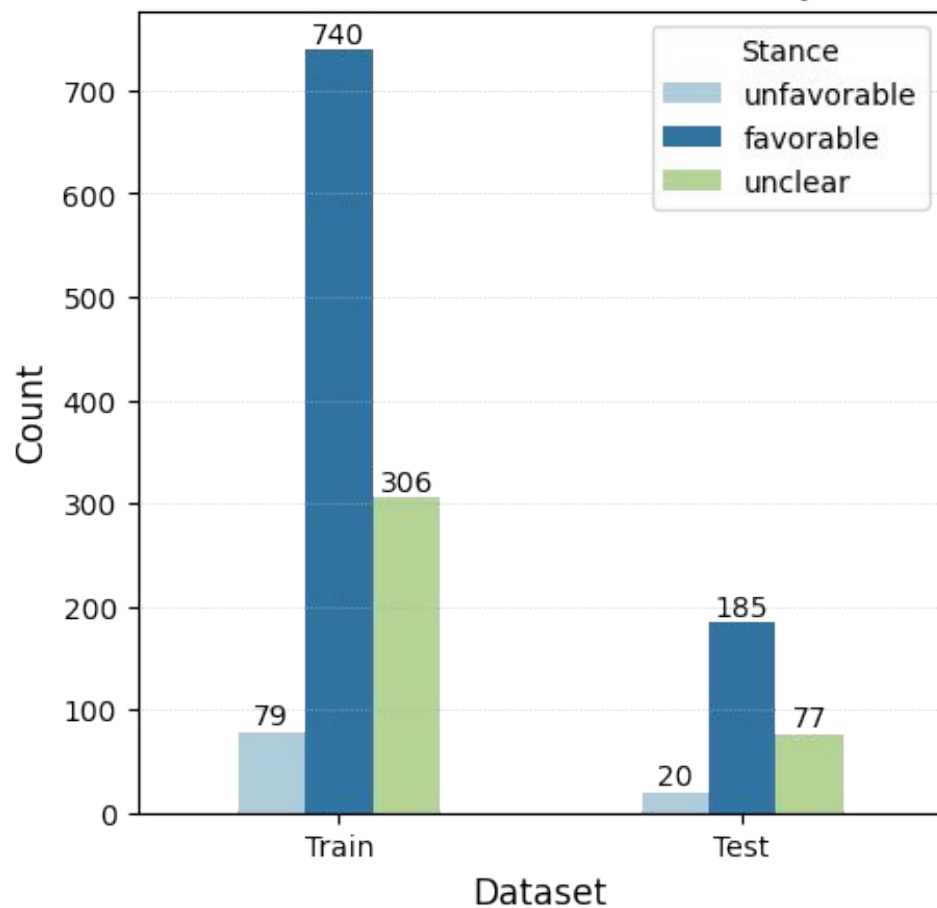
– 8:2 TRAIN/TEST SPLIT –

PREPARING THE DATA...

Stance Distribution - Whole Dataset



Stance Distribution - Train/Test Sets



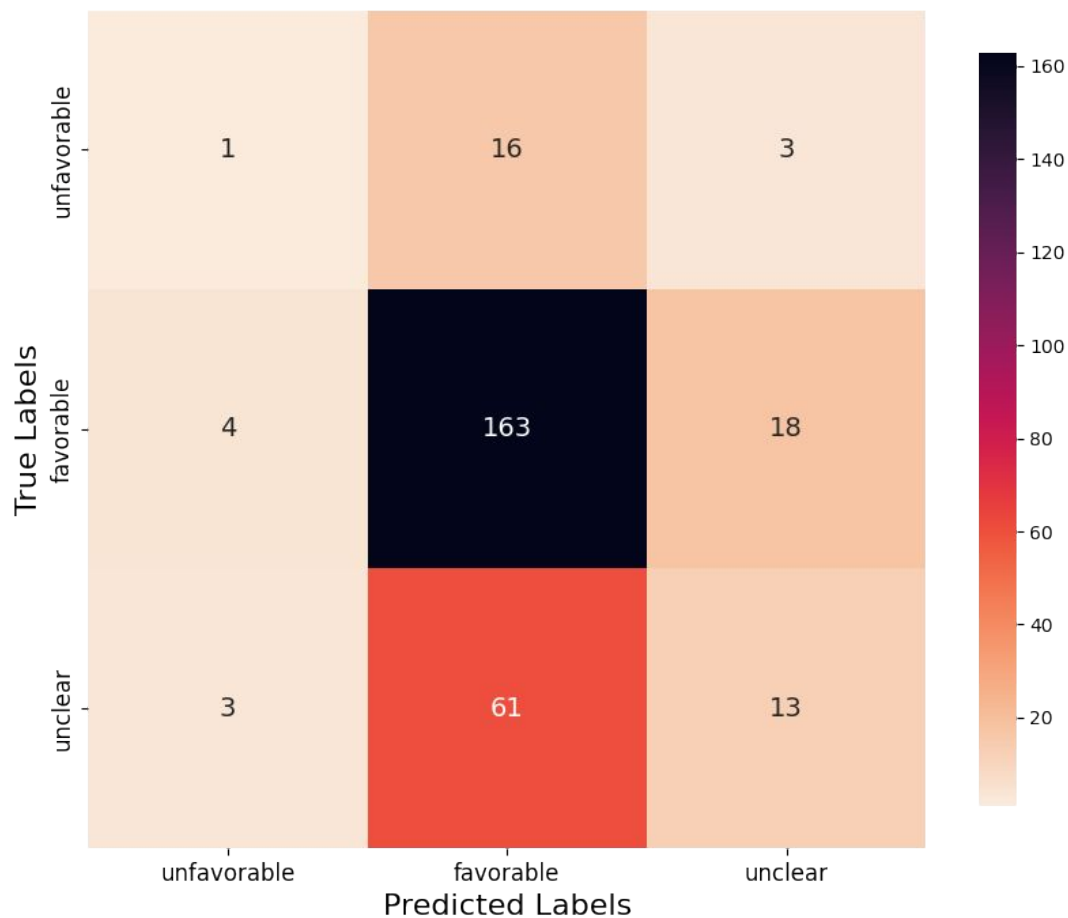
TEST BERTimbau...

Stance Performance Before Fine-Tuning

	precision	recall	f1-score	support
0	0.12	0.05	0.07	20.0
1	0.68	0.88	0.77	185.0
2	0.38	0.17	0.23	77.0
macro avg	0.4	0.37	0.36	282.0
weighted avg	0.56	0.63	0.57	282.0

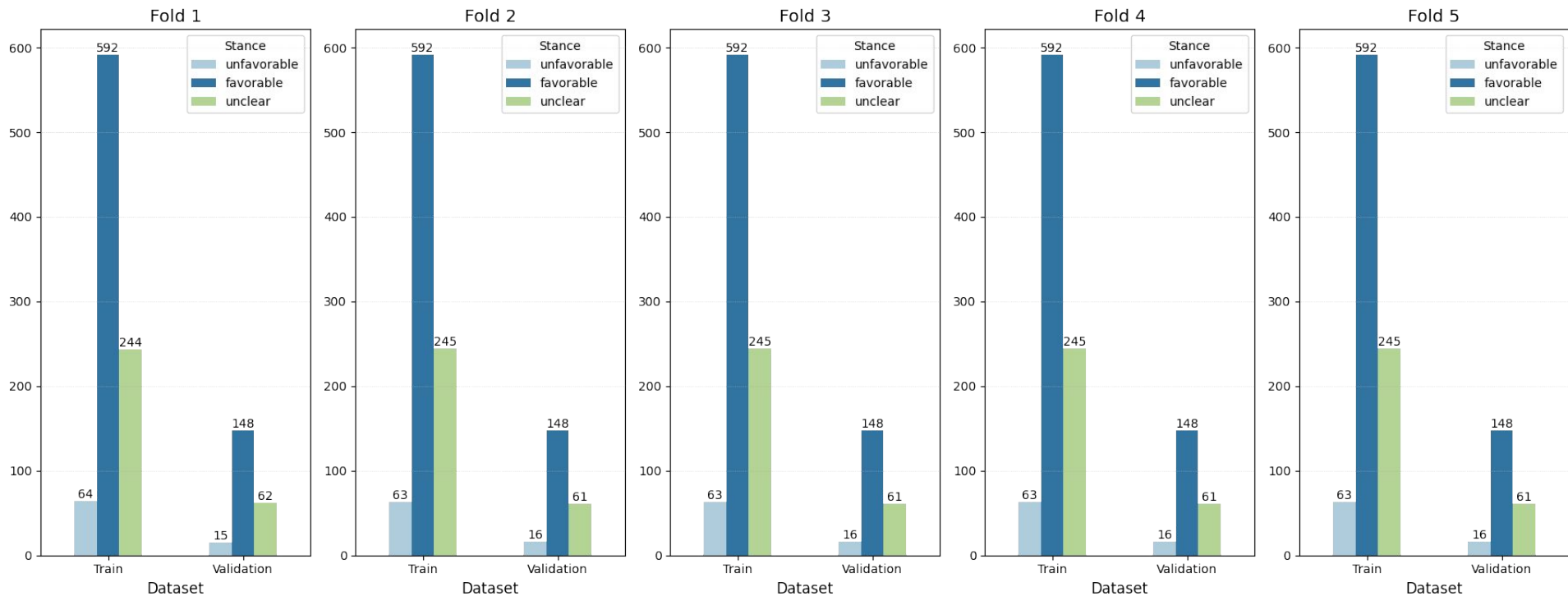
Overall Accuracy: 0.63

Stance Performance Before Fine-Tuning

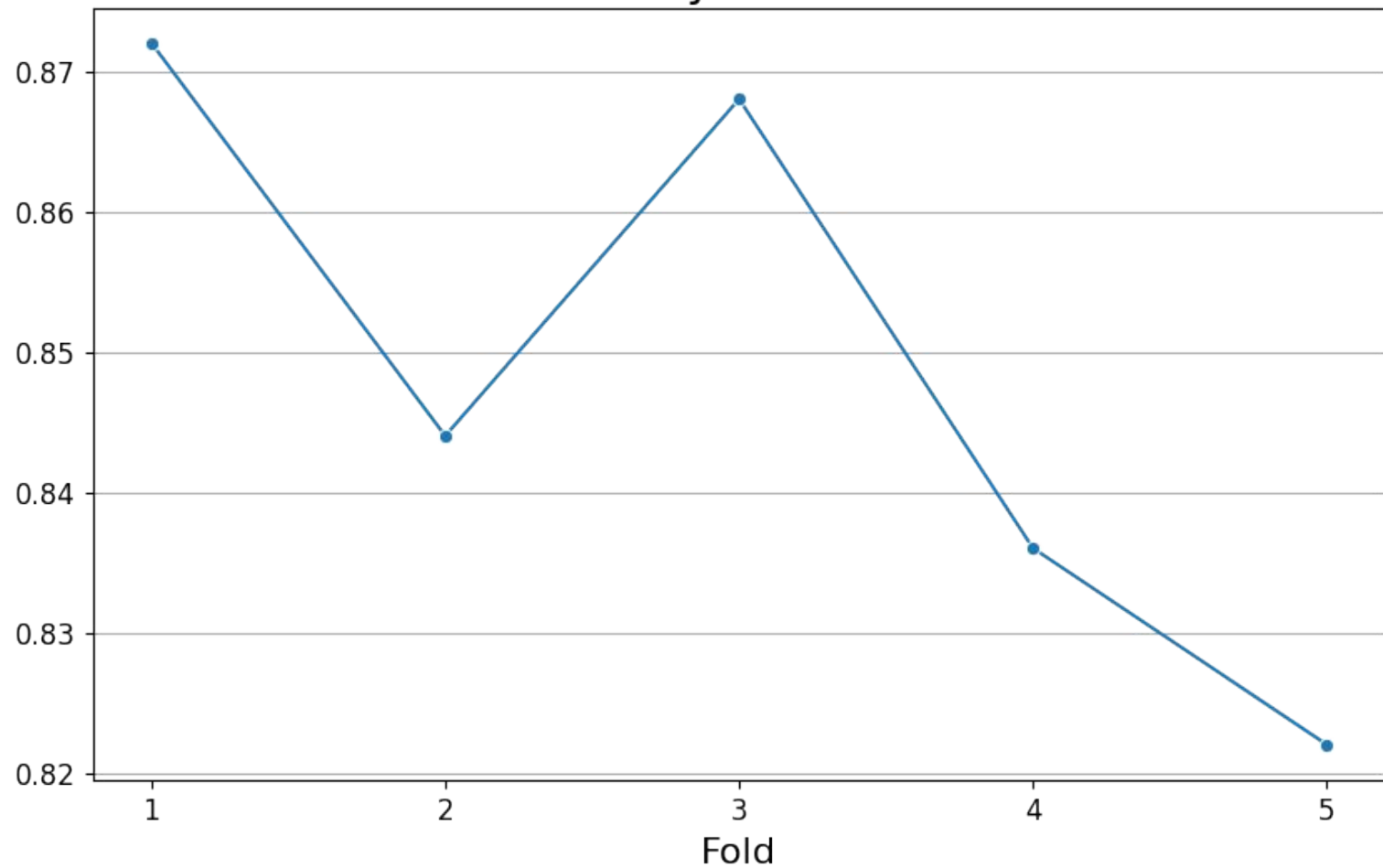


FINE TUNING...

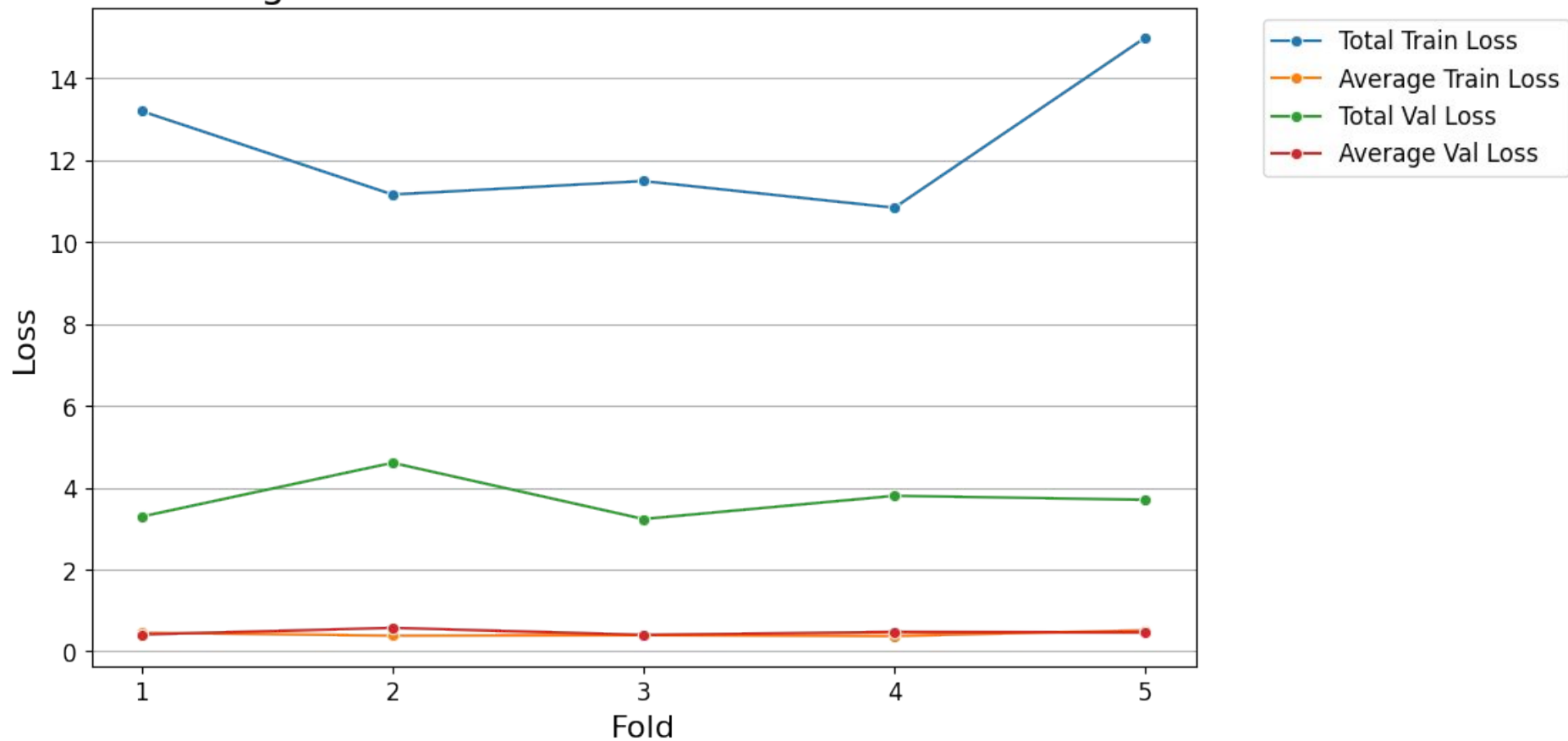
Stance Distributions Across Folds



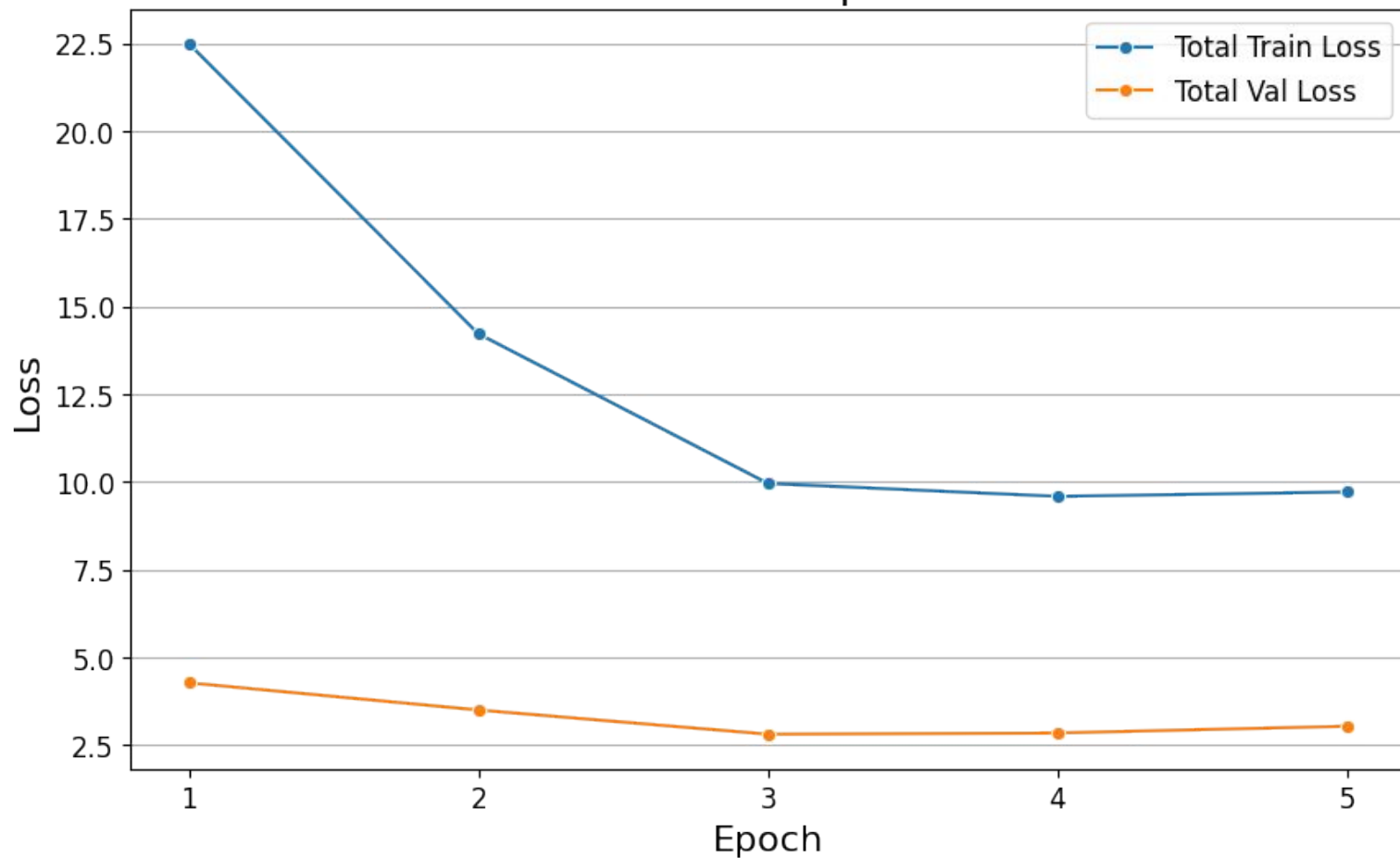
Validation Accuracy Across Folds - Stance



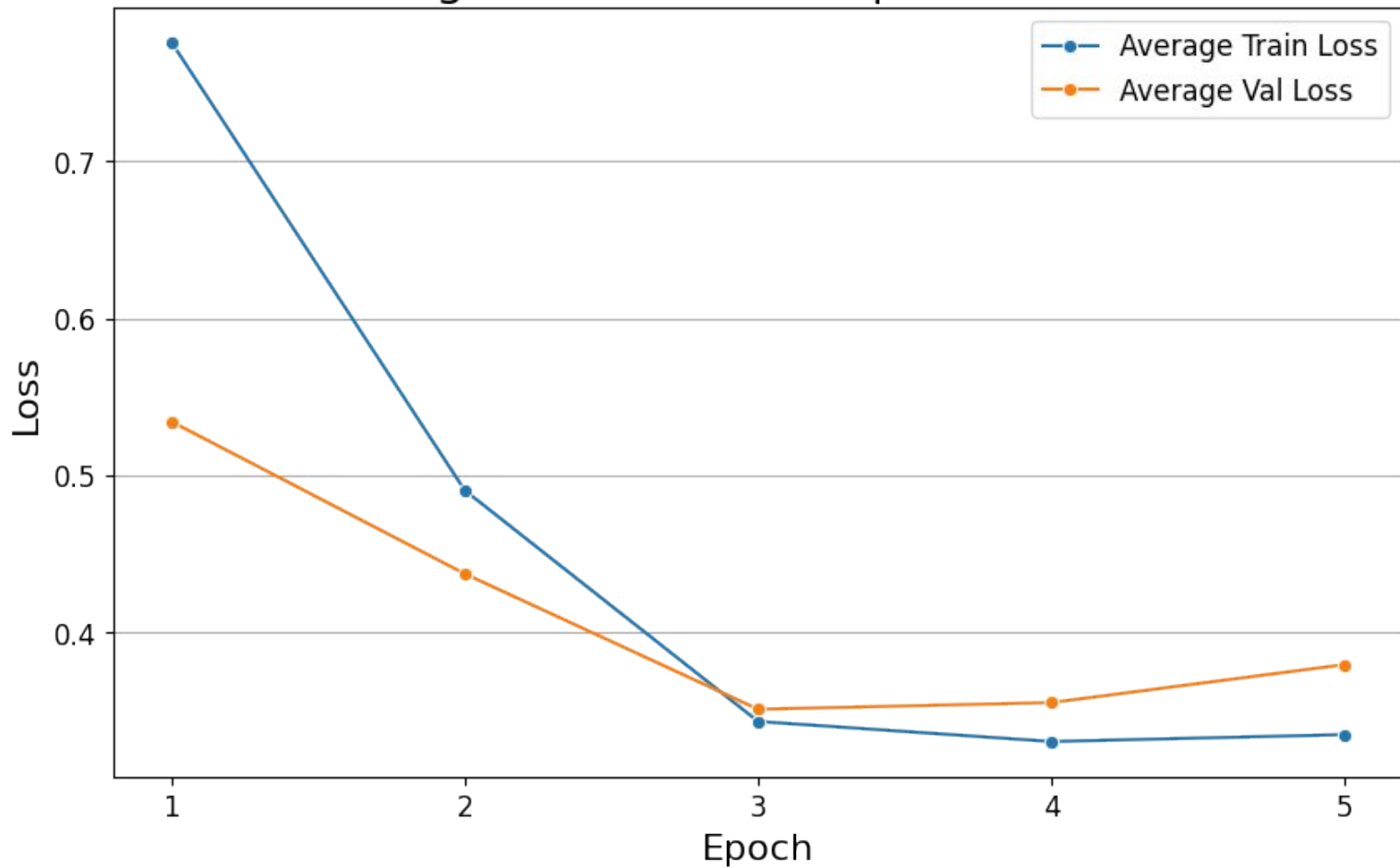
Training and Validation Losses Across Folds - Stance



Total Losses Across Epochs - Stance



Average Losses Across Epochs - Stance



TEST NEW MODEL...

Best Stance Performance After Fine-Tuning

	precision	recall	f1-score	support
0	0.0	0.0	0.0	20.0
1	0.88	0.96	0.92	185.0
2	0.86	0.91	0.89	77.0
macro avg	0.58	0.62	0.6	282.0
weighted avg	0.81	0.88	0.84	282.0

Overall Accuracy: 0.88

Stance Performance Before Fine-Tuning

	precision	recall	f1-score	support
0	0.12	0.05	0.07	20.0
1	0.68	0.88	0.77	185.0
2	0.38	0.17	0.23	77.0
macro avg	0.4	0.37	0.36	282.0
weighted avg	0.56	0.63	0.57	282.0

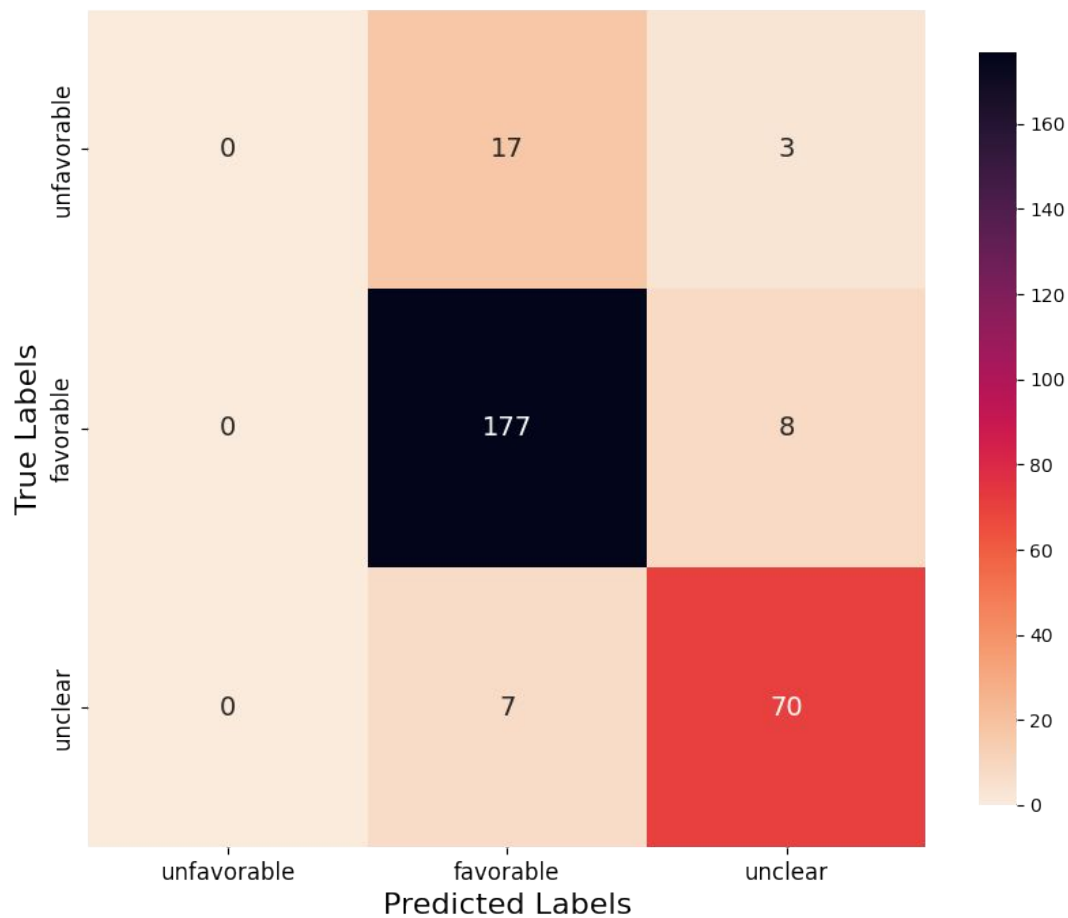
Overall Accuracy: 0.63

Best Stance Performance After Fine-Tuning

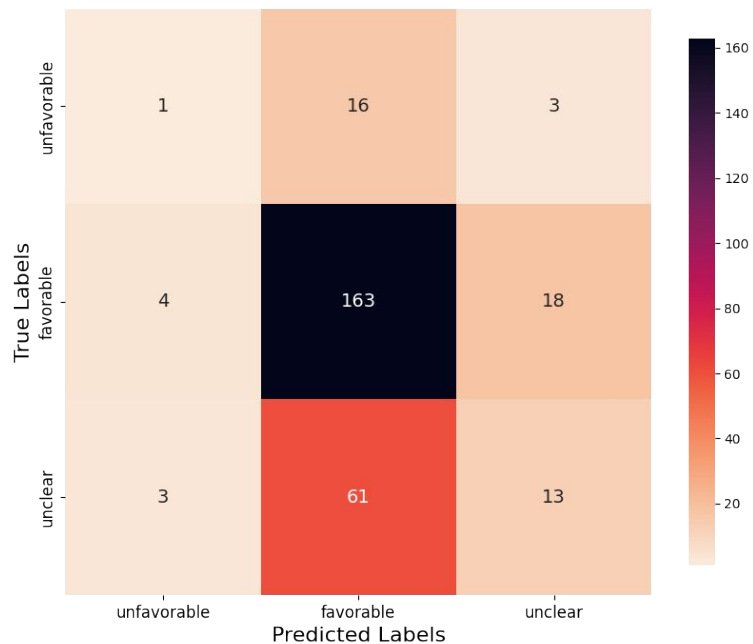
	precision	recall	f1-score	support
0	0.0	0.0	0.0	20.0
1	0.88	0.96	0.92	185.0
2	0.86	0.91	0.89	77.0
macro avg	0.58	0.62	0.6	282.0
weighted avg	0.81	0.88	0.84	282.0

Overall Accuracy: 0.88

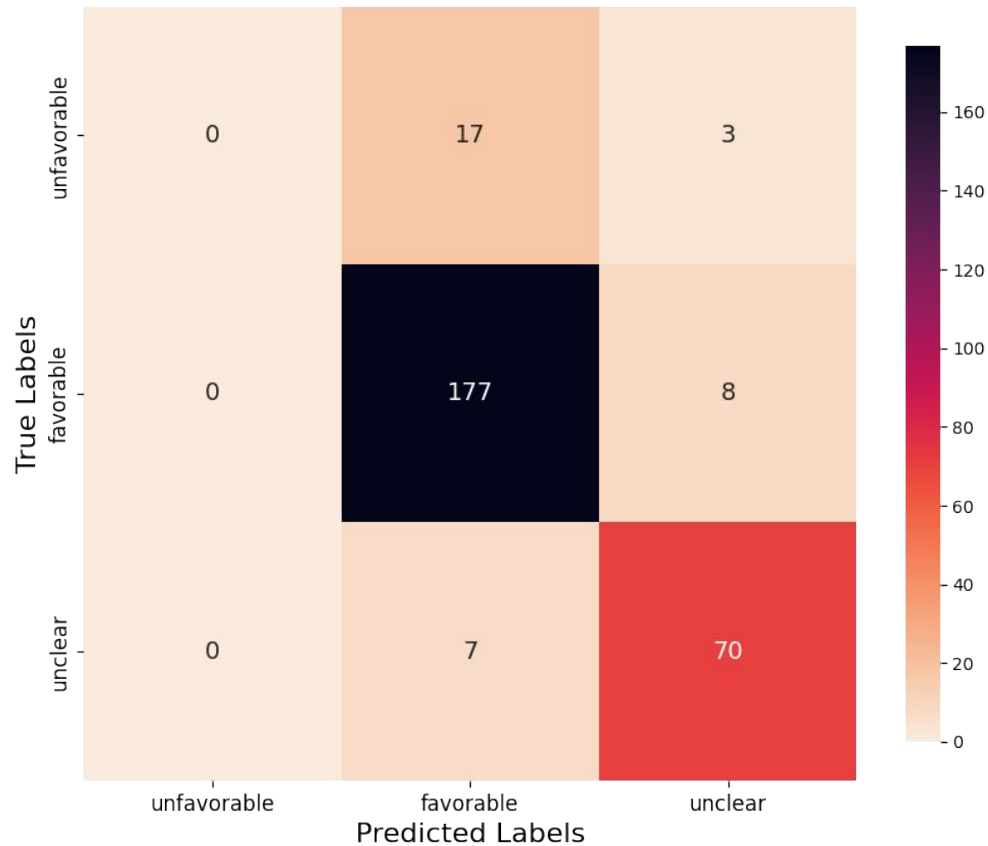
Best Stance Performance After Fine-Tuning



Stance Performance Before Fine-Tuning



Best Stance Performance After Fine-Tuning



EVALUATION ACROSS FOLDS...

Stance Performance After Fine-Tuning: Fold 1

	precision	recall	f1-score	support
0	0.0	0.0	0.0	20.0
1	0.87	0.99	0.93	185.0
2	0.93	0.86	0.89	77.0
macro avg	0.6	0.62	0.61	282.0
weighted avg	0.83	0.89	0.85	282.0

Overall Accuracy: 0.89

Stance Performance After Fine-Tuning: Fold 2

	precision	recall	f1-score	support
0	1.0	0.3	0.46	20.0
1	0.9	0.97	0.93	185.0
2	0.91	0.88	0.89	77.0
macro avg	0.93	0.72	0.76	282.0
weighted avg	0.91	0.9	0.89	282.0

Overall Accuracy: 0.9

Stance Performance After Fine-Tuning: Fold 3

	precision	recall	f1-score	support
0	0.92	0.55	0.69	20.0
1	0.91	0.98	0.95	185.0
2	0.94	0.87	0.91	77.0
macro avg	0.92	0.8	0.85	282.0
weighted avg	0.92	0.92	0.92	282.0

Overall Accuracy: 0.92

Stance Performance After Fine-Tuning: Fold 4

	precision	recall	f1-score	support
0	0.83	0.25	0.38	20.0
1	0.88	0.99	0.93	185.0
2	0.97	0.84	0.9	77.0
macro avg	0.89	0.7	0.74	282.0
weighted avg	0.9	0.9	0.89	282.0

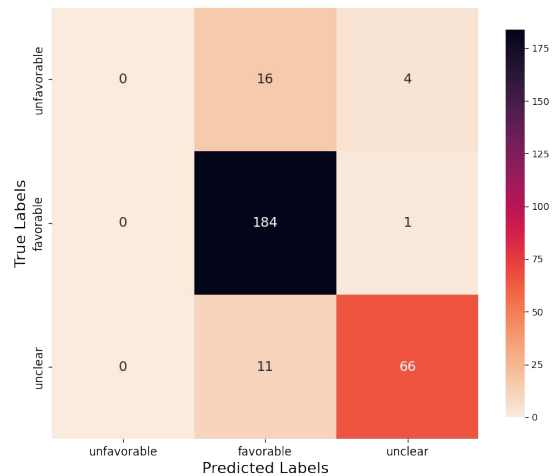
Overall Accuracy: 0.9

Stance Performance After Fine-Tuning: Fold 5

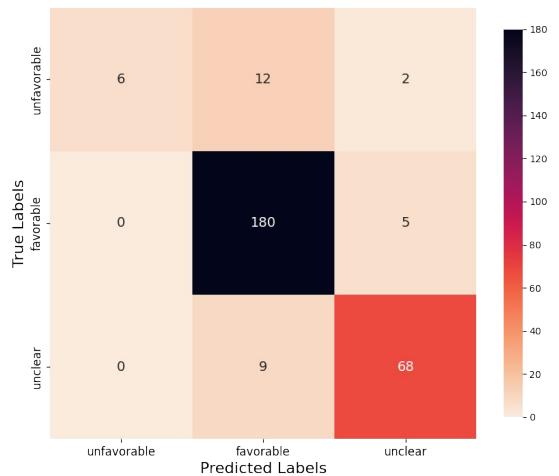
	precision	recall	f1-score	support
0	0.0	0.0	0.0	20.0
1	0.88	0.96	0.92	185.0
2	0.86	0.91	0.89	77.0
macro avg	0.58	0.62	0.6	282.0
weighted avg	0.81	0.88	0.84	282.0

Overall Accuracy: 0.88

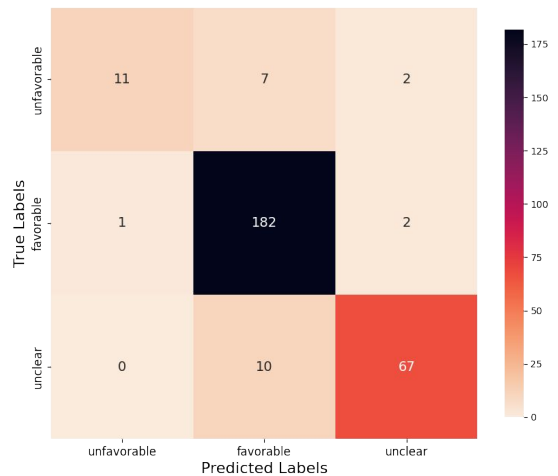
Stance Performance After Fine-Tuning: Fold 1



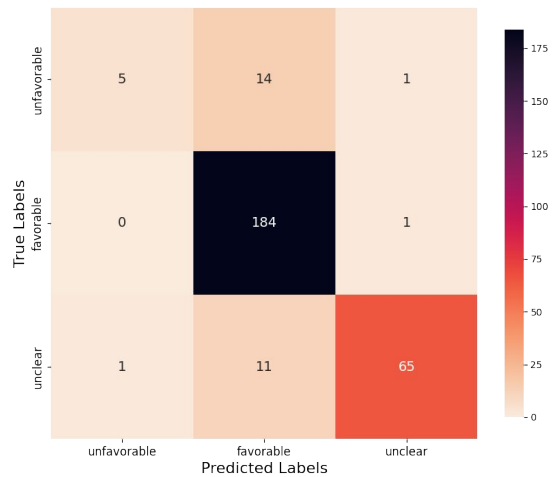
Stance Performance After Fine-Tuning: Fold 2



Stance Performance After Fine-Tuning: Fold 3



Stance Performance After Fine-Tuning: Fold 4



Stance Performance After Fine-Tuning: Fold 5

