Comparison and Discussion

Let's compare these results (Bidirectional, 2 Layers, 5 Epochs) with the results from the initial run you provided (Non-Bidirectional, 2 Layers, 2 Epochs):

Metric	Initial Run (Non-Bi, 2 Epochs)	Current Run (Bi, 5 Epochs)
Train Loss	0.6923	0.1720
Train Acc	51.23%	93.89%
Val Loss	0.6922	0.3932
Val Acc	53.28%	85.94%
Test Loss	0.6921	0.4264
Test Acc	51.49%	84.81%

The improvement is dramatic! The initial model was barely performing better than random guessing (50% accuracy), likely due to the short training time and perhaps insufficient model capacity or training issues.

The current Stacked Bidirectional LSTM model trained for 5 epochs achieves a test accuracy of **84.81%**. This is a strong result for this dataset and a significant improvement over the initial run.

Observing the training progression for the bidirectional model:

- Training loss decreases steadily, and training accuracy increases steadily, indicating the model is learning and fitting the training data well.
- Validation loss decreases sharply in the first few epochs but starts to slightly increase after epoch 3 or 4.
- Validation accuracy improves rapidly up to epoch 3-4 and then plateaus or slightly dips in epoch 5.

This pattern (training metrics continue improving, while validation metrics plateau or worsen) suggests that the model might be starting to overfit the training data slightly in the later epochs. Training for slightly fewer epochs (e.g., 3 or 4) or adding more regularization might yield a marginally better result on unseen data, although 84.81% test accuracy after 5 epochs is still very good and indicates the model generalizes well despite the slight validation loss increase.