Approach -1 (Learning Phase)

Anomaly prediction and learnt how to create a LSTM model for time series.

Learning the pattern and predicting the potential anomalies but not anomaly scores

Using K fold Cross validation approach for Travel Time – 387 dataset.

Cross-Validation Results:

**Mean Squared Error (MSE): 0.35**

**Mean Absolute Error (MAE): 0.17**

**Root Mean Squared Error (RMSE): 0.59**

**Best Fold Index: 3**

Conformal prediction results:

**Early stopping at epoch 136**

**Conformal Prediction Results (90% confidence):**

**Coverage: 95.64%**

**Average Interval Width: 256.09**

**MAE: 56.21**

**RMSE: 242.9**

(Unnormalized results)

Approach – 2 (Actual Approach)

Anomaly prediction with a trained LSTM model for time series to predict future anomalies and give anomaly scores based on the threshold specified.

Using the model which was trained for Traffic\_Travel-time – 387 to predict the conformal scores for the data Travel\_time- 451

We have scaled our conformal scores using MIN – MAX approach.

**RMSE: 0.082**

**MAE: 0.033**

**MSE: 0.006**

Our regression errors are **low**, which is good.

If our anomaly scores are normalized between 0 and 1, we can think of this as your model being around 91–96% accurate in score prediction, depending on our tolerance for error when comparing with NAB benchmark results.

The closest thing to an “accuracy” score in regression is **R² .**

It tells us **how much of the variance in the true data your model can explain**.

**Interpretation:**

* R² = 1 → perfect prediction
* R² = 0 → model is no better than predicting the mean
* R² < 0 → model is worse than just using the mean

**Logic for R² score:**

function r2\_score (predicted\_scores, true\_scores)

ss\_res = sum((true\_scores .- predicted\_scores).^2)

ss\_tot = sum((true\_scores .- mean(true\_scores)).^2)

return 1 - (ss\_res / ss\_tot)

end

(As we had error loading NAB scorer for benchmarking, the results of anomaly scores are compared directly with the results of the corresponding NAB data results)