

Time Series Classification with Transformers

BY Team Poriyiyal !

Some “Cool” terms



Time Series

- Seq of Observations over a certain period
- Univariate/Multivariate



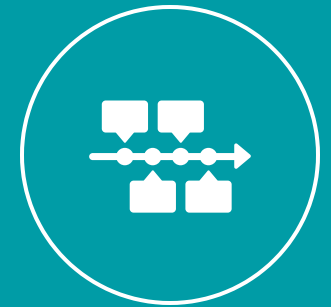
Attention

- Helps focus on relevant parts of the input sequence
- Passes all hidden data to decoder and allots scores to them. The largest weighted hidden data wins !



Transformer

- Encoder-Decoder with Self Attention and FF Layers.
- For More Info, we'll have a chat after the pitch !

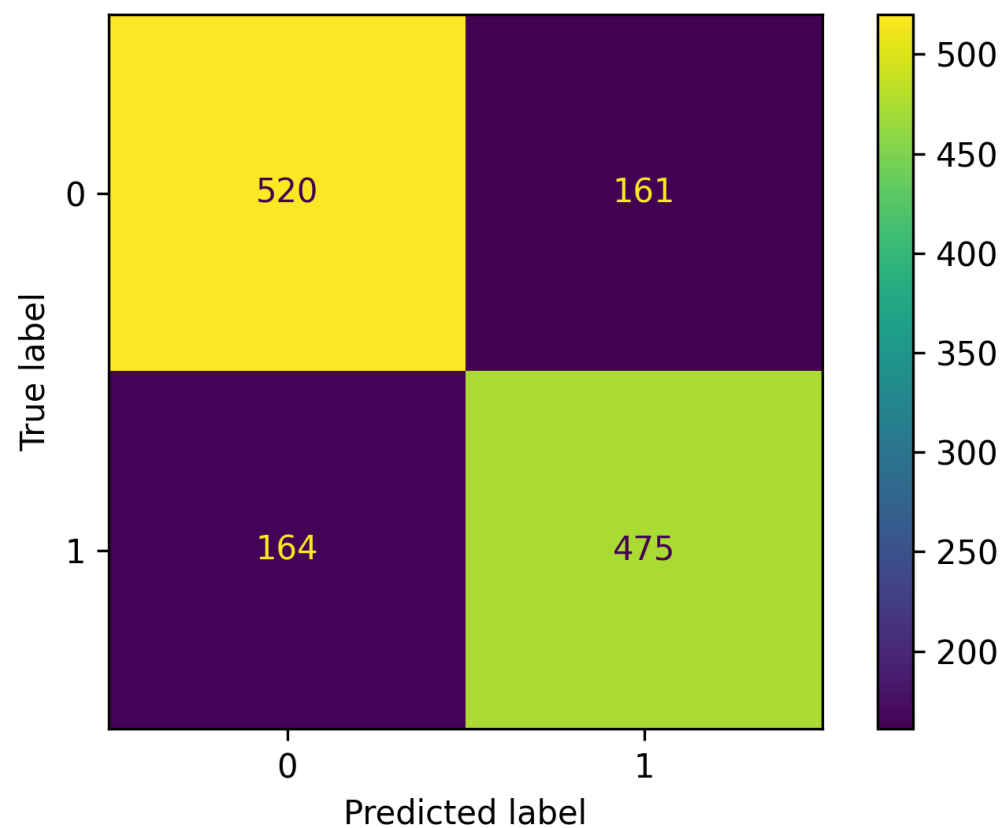


Voting Classifier

Tasks for the competition

- Implement transformer algorithm for classification of time series dataset
- Train the model and report your findings on the validation split
- Compare the results by running provided LSTM network

LSTM Stats



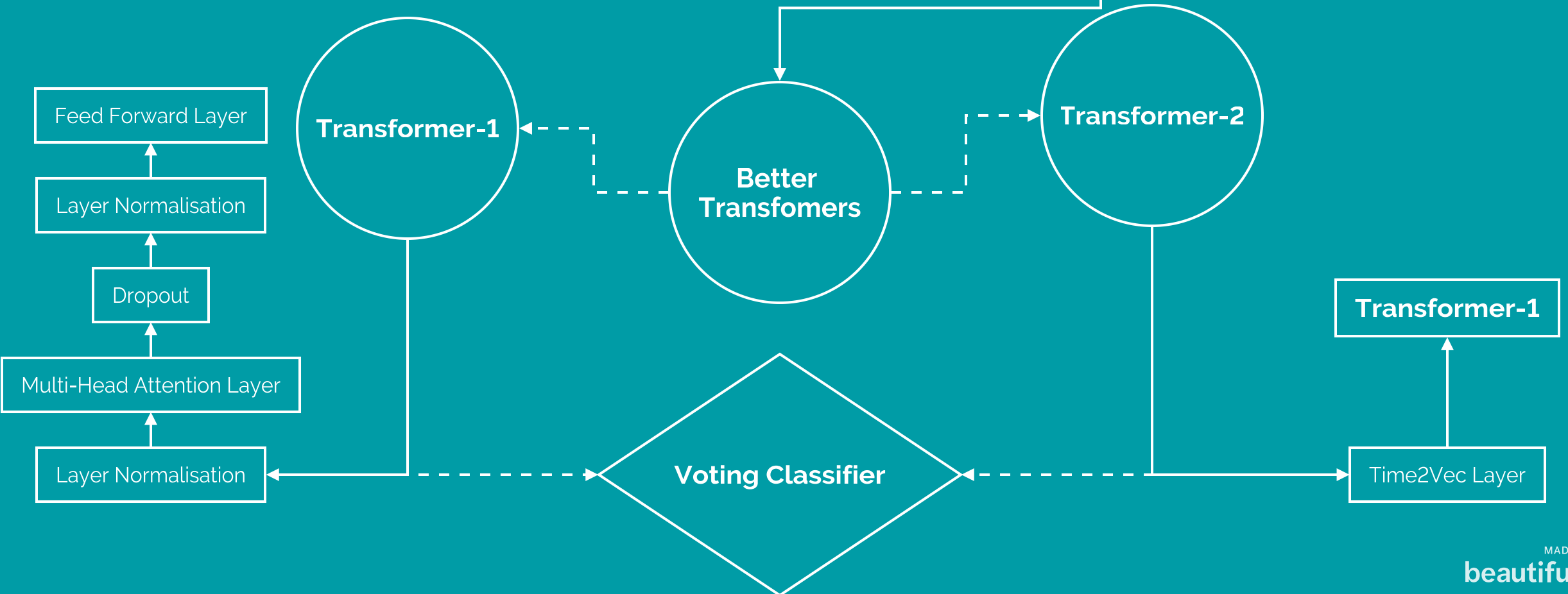
- An Accuracy of 75% after 100 Epochs

Architecture !

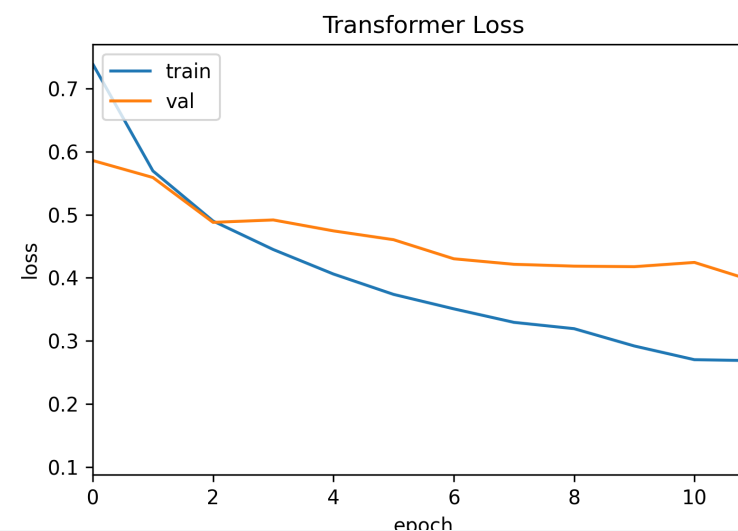
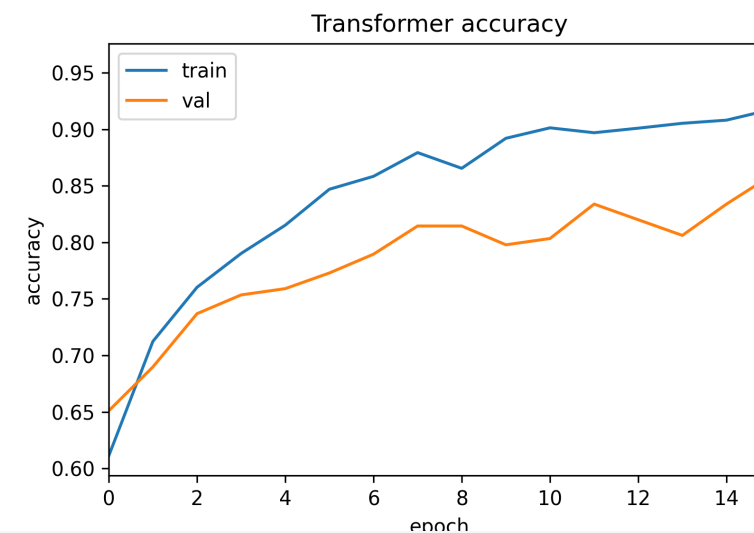
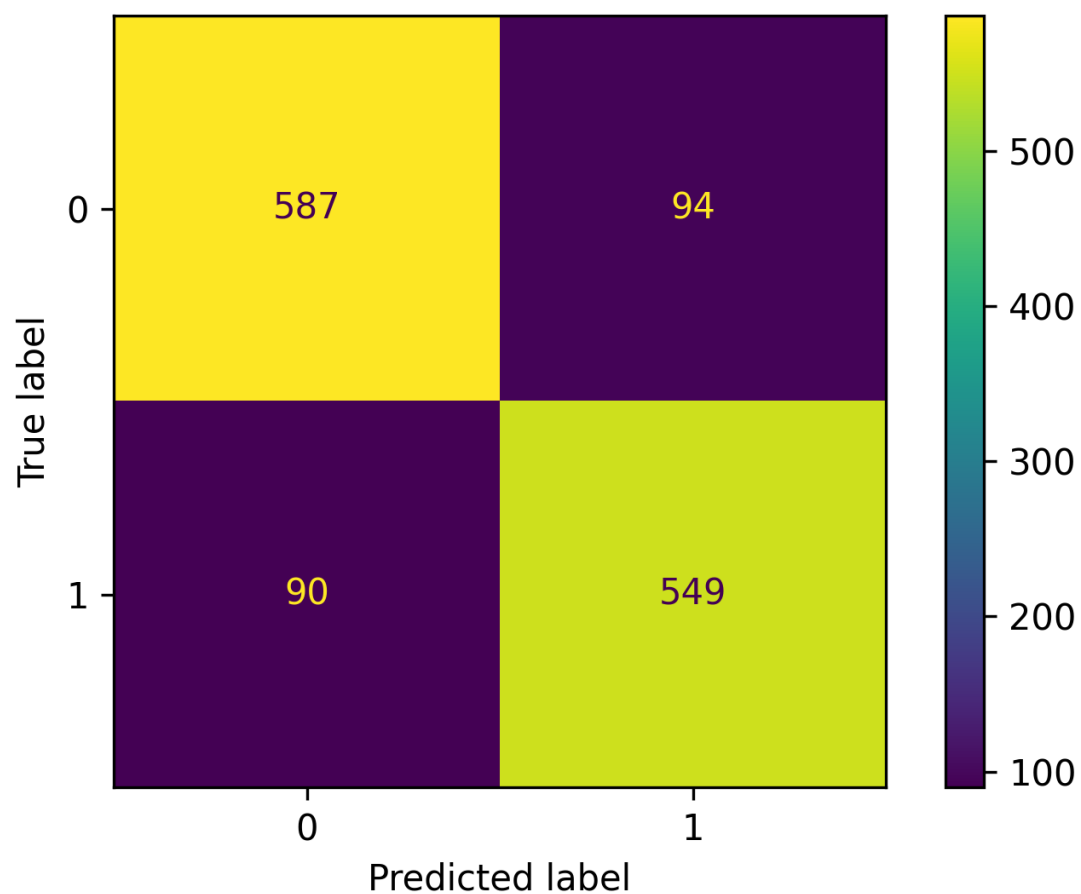
When CNN is used here, we get good test accuracy (~94%)

However, when we scale up the data (increase datapoints), CNN CANNOT be the right tool

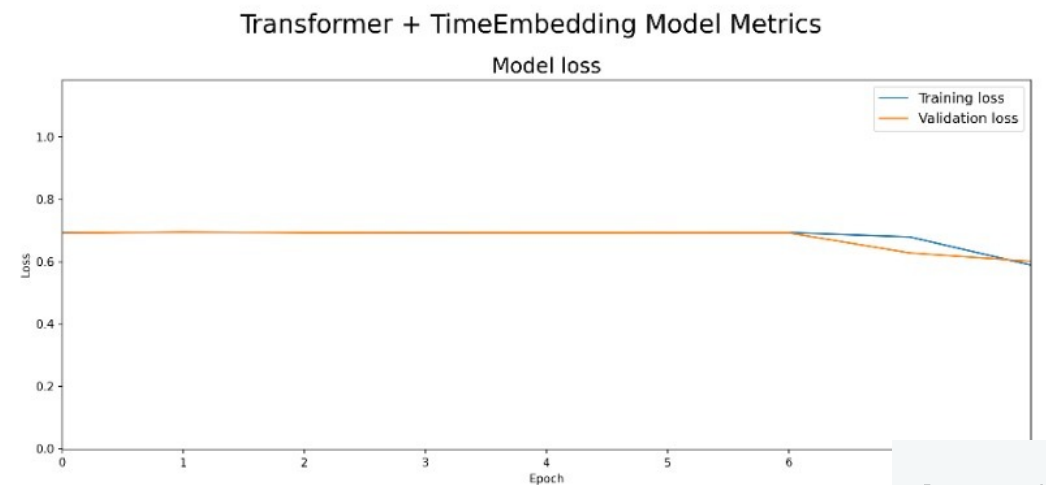
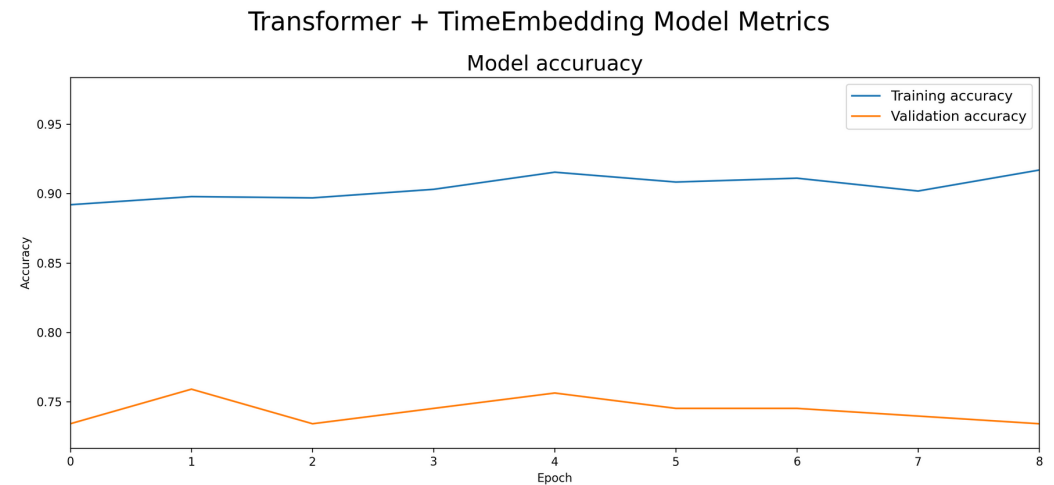
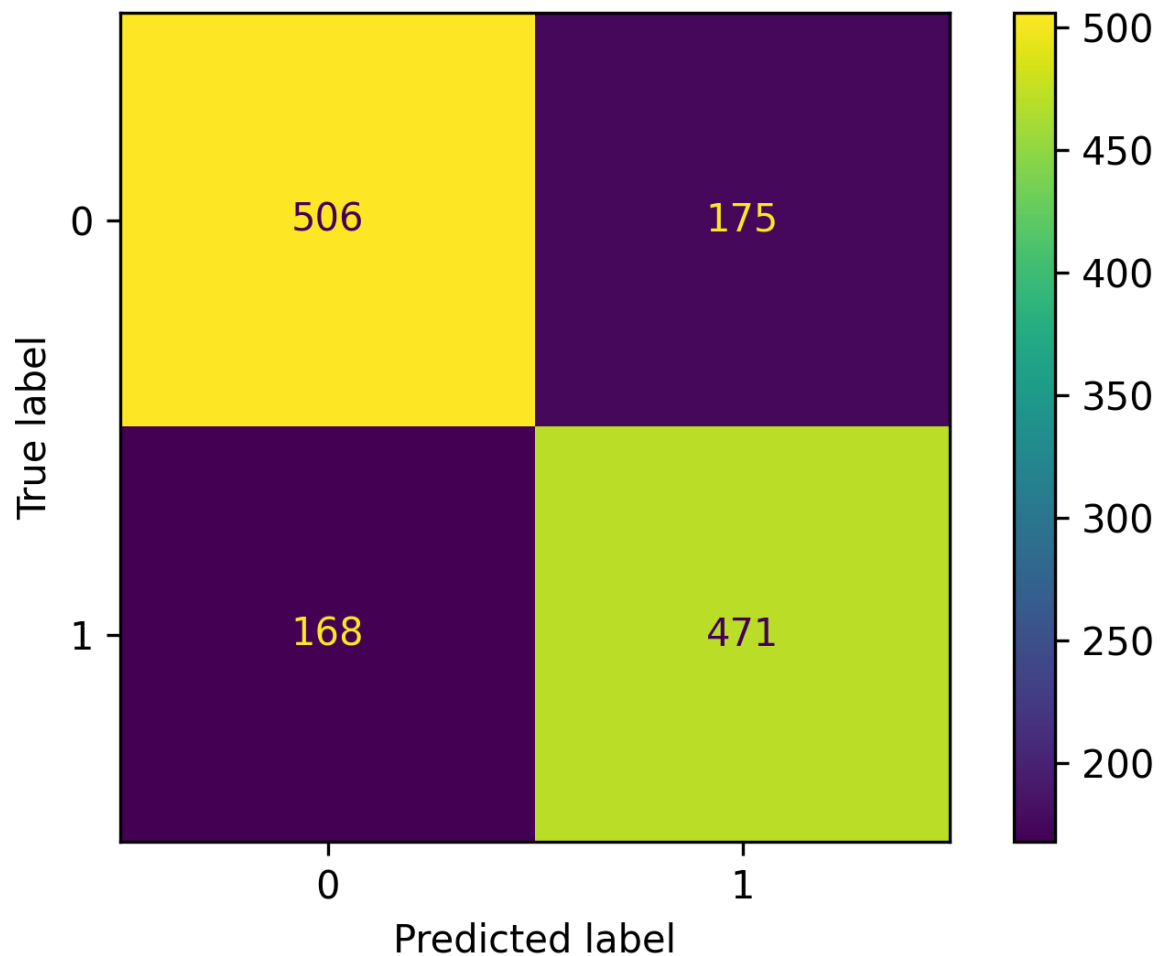
LSTM can be good for upto a series of 100 beyond which it suffers from "SHORT TERM MEMORY"



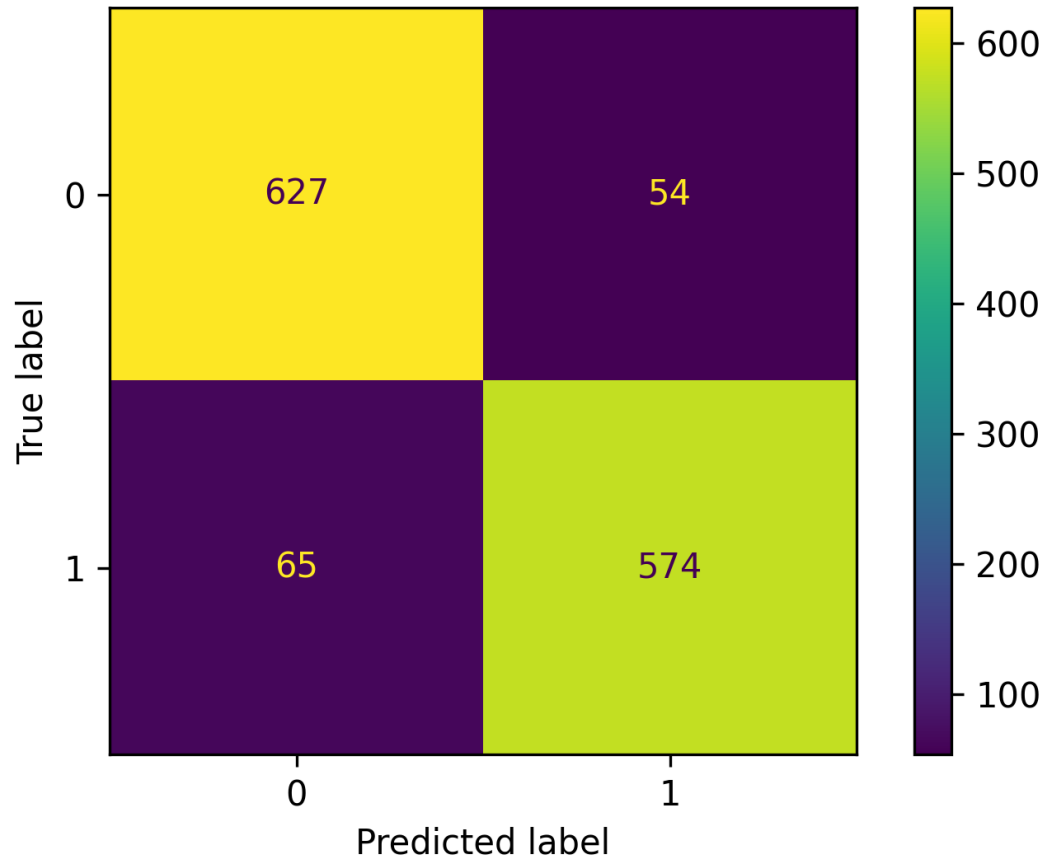
Transformer-1 (vanilla transformer) (86% Accuracy)



Transformer-2 (with time2vec) - (74% Accuracy)



Results - 90.9% accuracy



With Voting, we were able to reach 90.9% Accuracy.

Voting allow you to weight your models based on the probability of a right prediction, thus providing a powerful model

With the bonus assignment, the task required higher computation power, which we lack at the moment

Thank you for your time !



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