

CSE655 – Deep Learning (Spring 2025)

Homework #3

Hand-in Policy: Via Teams. Late submission rules are given in the course syllabus.

Collaboration Policy: You are expected to do your own work. No collaboration is permitted.

Grading: This homework will be graded on the scale 100.

Description: Time series analysis with LSTMs and transformers.

You are expected to use the Python language unless otherwise noted. You will prepare a report including your code and results (in a Jupyter Notebook). The report format is shown at the end of this document.

In this assignment, you will write a simple stock market predictor for Tesla. The historical data is provided in the attachment.

Part 1: Prediction with LSTM

Train a stock value predictor using LSTM for this company and report the performance of your predictor:

- Use an appropriate LSTM model. Train with the first 70 percent of the data and test with the rest. Report the performance of your model.
- Repeat the above using an additional feature. Add the value of gold as input for the same date intervals and retrain your model and report performance.

Part 2: Prediction with Transformers.

Repeat the above using transformers.

What to hand in: You are expected to hand in the following

- **Homework3_StudentNumber_LastName_FirstName.ipynb** (the Python Jupyter Notebook used to obtain the result provided in the report). You **MUST** follow this convention of submission file naming as some of your identities cannot be determined from your Teams profiles.

Report format should be something like the following:

Part 1: LSTM

Code:

Results:

Comments:

Part 2: Transformer

Code:

Results:

Comments: