**Professional Certificate in Machine Learning and Artificial Intelligence**

Required activity 25.3

Portfolio project on optimising a model for real-life data

The model analyses historical stock price and return prediction of the future stock price.

**Model description**

Input: Historical stock price of a specific stock (365days)

Output: Predicted stock price of a specific stock up to 5 days.

**Model architecture**

An extension of Recurrent Neural Networks (RNN), Long Short Term Memory (LSTM) are used to model sequential and chronological data. Bayesian optimisation was used to fine-tuned 4 parameters: hidden layers, neurons, epoch and learning rate.

**Performance**

Performance metric used to measure model is Mean Square Error (MSE).

For Bayesian optimisation, absolute summation of differences from predicted and actual are used to find the global minima.

**Limiting factors**

1. Inherently stochastic data:
   1. Stock prices are noisy by nature as data are driven by humans. Longer historical data used to train the model will result in a degradation of performance.
2. Sensitivity Hyperparameters:
   1. Using Bayesian optimisation, it is possible to fine-tuned hyperparameters.
   2. Note that this approach is computationally expensive.