Financial Mathematics 2019

Assignment

Prediction of Stock Prices

You are expected to submit your python notebook and the outputs of you code for the tasks below will be accessed.

1. Go on the **YAHOO** FINANCE website and download **daily**, **historical prices** of the **JSE LIMITED (JSEJF) Stock Prices** for the period **January 01, 2018** to **December 31, 2018**.
   (**Note:** *the default name of the data file should be* **JSEJF.csv**)

2. Make a new dataframe with only the columns: **Open**, **High**, **Low**, and **Close**. Use this dataframe as your dataset for the remaining tasks below.

3. Use ScikitLearn's **MinMaxScaler()** function to normalise your data to be between -1 and 1

4. Split your data into **training** and **testing** at a proportion of your choice. Justify why you used such a proportion.

5. Using a **rolling window** (look-back) of 10, create a labelled training and testing sets, and reshape these sets to have the format the sizes of [**samples, timesteps, features**].

6. Train and test a **Stateful** LSTM model. State your final training and testing losses.

7. Super-imposed on each other, plot the training, the predictions on the training, the testing and the predictions on the testing data in one figure.

8. (*Bonus points*) Repeat 7 using the actual prices of the stock instead of the normalised values used in 7 above.
   (**Hint:** *this involves using the inverse of* **MinMaxScaler()**)