Assignment: RNN and ConvNets (60 points)

The data file "data.csv" contains 3 time series x1, x2, and y along with the corresponding date column. The data ranges from beginning of 2019 to the end of Feb. of 2020. The objective of this problem is to make predictions for y for March 1st and 2nd in 2020.

1. Explore regular feedforward neural network models for this problem. (10 points)
   (a) Report the unnormalized MAE of the test set on your best model.
   (b) Plot the loss curves for training and validation sets for the best model.
   (c) What are the predicted values of y for March 1st and March 2nd?
2. Explore recurrent neural network models for this problem. (10 points)
   (a) Report the unnormalized MAE of the test set on your best model.
   (b) Plot the loss curves for training and validation sets for the best model.
   (c) What are the predicted values of y for March 1st and March 2nd?
3. Explore 1d convolutional neural network models for this problem. (10 points)
   (a) Report the unnormalized MAE of the test set on your best model.
   (b) Plot the loss curves for training and validation sets for the best model.
   (c) What are the predicted values of y for March 1st and March 2nd?

In this problem, you need to apply all ML foundation and techniques that you've learned in the program so far. These include but are not limited to: **data cleaning, data imputation for missing values, full exploratory analysis along with relative visualisations, statistical tests, data normalization, data split, addressing overfitting/underfitting, tuning hyperparameters, model assessment, etc.. Feel free to apply the techniques you've learned in your time-series course here when relevant.** (30 points)