AI & Pattern Recognition Classwork 07 RNN

ID： _____ **Name：** _____ **May 14, 2025**

1. Generate 4000 time series with 80 time steps. The 80% of the generated data is used for training and the rest is used as validation data.

   (a) Build a linear regression model to predict 10 values time steps ahead. Plot the waveform and its prediction in the 5^{th} generated time series in train set and the 10^{th} generated time series in validation set.

   (b) Build a LSTM model to predict 10 values time steps ahead. The LSTM contains two layers with 10 and 10 units, respectively. Plot the waveform and its prediction in the 5^{th} generated time series in train set and the 10^{th} generated time series in validation set.

   (c) Build a RNN model to predict 10 values time steps ahead. The RNN contains two layers with 10 and 10 units, respectively. Plot the waveform and its prediction in the 5^{th} generated time series in train set and the 10^{th} generated time series in validation set.

   (d) Compare the generated waveform and MSE among the aforementioned models.