DeepLearning.AI Tensorflow Developer

Sequences, Time Series and Prediction: Week 4

Time Series Convolution Model

For time series forecasting we add new Conv1D layer with filter, kernel, padding, activation and strides. Also, train LSTM model for higher epochs to calculate the optimal learning rate. Applying bidirectional LSTM generates higher MAE value, causing overfitting. Tweaking batch size improves the overfitting issue in gradient descent optimization model.

```
model = tf.keras.models.Sequential([

    tf.keras.Input(shape=(window_size,1)),

    tf.keras.layers.Conv1D(filters=64, kernel_size=3,

              strides=1, padding="causal", activation="relu"),

    tf.keras.layers.LSTM(64, return_sequences=True),

    tf.keras.layers.LSTM(64),

    tf.keras.layers.Dense(1),

    tf.keras.layers.Lambda(lambda x: x * 400)])
```

Kaggle sunspot dataset provides real life time series data of sunspots in monthly interval. Sunspot data contains seasonality and noise but lacks any trend. NN model training requires larger window size and training splits to capture the seasonality of the sunspot data. Tweaking batch size, window size, LSTM units and Conv1D filters yields different MAE error values.