LSTM Model & F score

Walk thru...

What is it?

- **Long Short-Term Memories (LSTM)** is a Recurrent Neural Network (RNN) based architecture that is widely used in natural language processing and time series forecasting.

- In another saying, it’s an artificial neural network used in AI and Deep Learning.
- This is the **most popular** model people use to **predict stock** | crypto trends (prices) now.

How accuracy is it?

- if using for stock | crypto trend prediction, this model doesn't need to reach high levels of accuracy because even **60%** **accuracy** can deliver solid returns. (**our Project we got 74% which is good**).

General step by step when implementing LSTM

Suppose that we completed all Data Preprocessing, cleaning steps, below is the step by step in applying LSTM

Data Normalization

```
from sklearn.preprocessing import MinMaxScaler

sc = MinMaxScaler(feature_range=(0,1))

training_set_scaled = sc.fit_transform(training_set)
```

Incorporating Timesteps Into Data

input our data in the form of a 3D array to prep for the LSTM model

```
X_train = []y_train = []for i in range(60, 2035):X_train.append(training_set_scaled[i-60:i, 0])y_train.append(training_set_scaled[i, 0])X_train, y_train = np.array(X_train), np.array(y_train)X_train = np.reshape(X_train, (X_train.shape[0], X_train.shape[1], 1))
```

Creating the LSTM Model

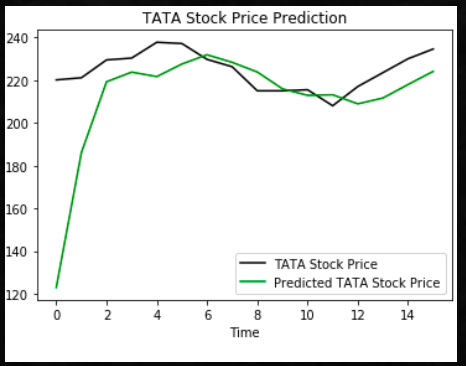
```
model.add(LSTM(units=50,return_sequences=True,input_shapmodel.add(LSTM(units=50,return_sequences=True,input_shape=(X_train.shape[1], 1)))e=(X_train.shape[1], 1)))
```

Making Predictions on the Test Set

Use MinMaxScaler and reshape data to modify the test (y); the transform to put the result in a normal readable format

Plotting the Results

Use matplotlib to visualize the result of our predicted stock price and the actual stock price.



Get the score to test the accuracy of LSTM model

- Use F_Score to evaluate the LSTM model or we can say, to make sure our prediction is reliable, by these steps:
  - Define a function in which covered our values of reshaped df; (MinMaxScaller; fit_transform(df) applied; return the variables represented for new df X and new y
  - Define an F score function that evaluate the outputs of the above function.
  - Get the score by math library Fscore = math.sqrt()

What is F score?

- F score is a configurable single-score metric for evaluating a binary classification model based on the predictions made for the Positive or Negative.
- In other words, F-score reveals the discriminative power of each feature independently from others.

Some key Dependencies

- from keras.models import Sequential
- from keras.layers import LSTM
- from keras.layers import Dropout
- from keras.layers import Dense
- model = Sequential()
- Below syntax is at the LSTM model building step:
  - model.add(LSTM(units=50,return_sequences=True,input_shape=(X_train.shape[1], 1)))