STOCK PRICE PREDICTION

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STOCK MARKET

A stock market is a public market where you can buy and sell shares for publicly listed companies. The stocks, also known as equities, represent ownership in the company. The stock exchange is the mediator that allows the buying and selling of shares.

IMPORTANT OF STOCK MARKET:

- Stock markets help companies to raise capacities.
- It helps generate personal wealth.
- Stock markets serve as an indicator of the state of the economy.
- It is a widely used source for people to invest money in companies with hig

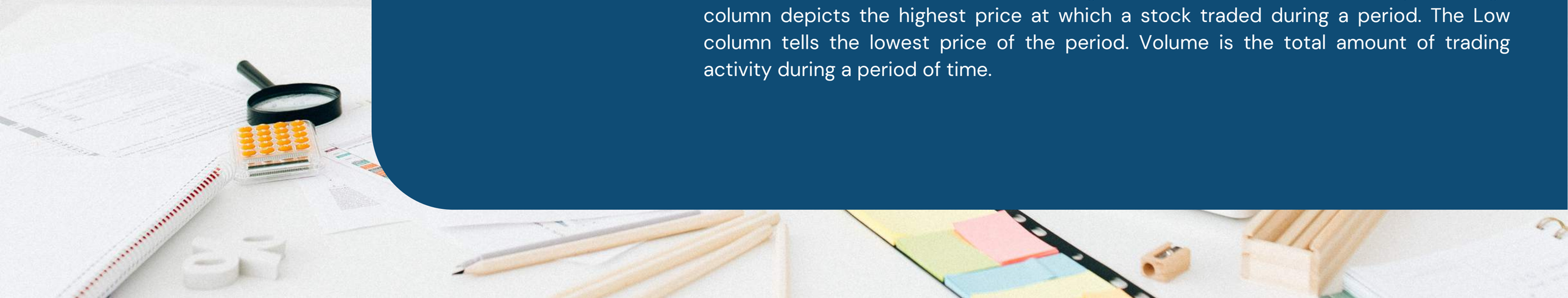
Google Stock Price Prediction Using LSTM

Importing Libraries

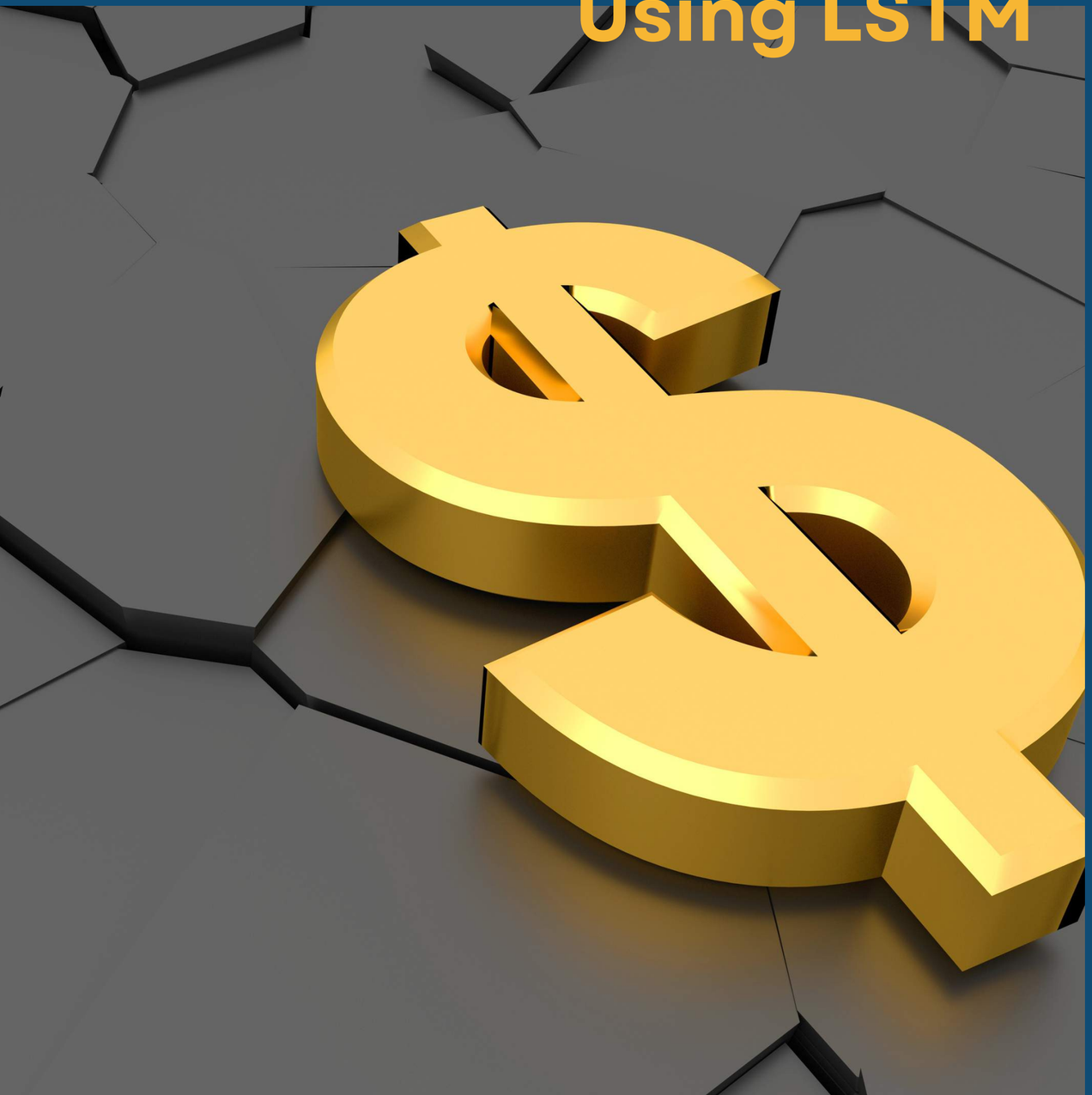
```
#Import libraries
import os
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
```

Load the Training Dataset.

The Google training data has information from 3 Jan 2012 to 30 Dec 2016. There are five columns. The Open column tells the price at which a stock started trading when the market opened on a particular day. The Close column refers to the price of an individual stock when the stock exchange closed the market for the day. The High column depicts the highest price at which a stock traded during a period. The Low column tells the lowest price of the period. Volume is the total amount of trading activity during a period of time.



Stock Price Prediction Using LSTM



```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sb

from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.linear_model import LogisticRegression
from sklearn.svm import SVC
from xgboost import XGBClassifier
from sklearn import metrics

import warnings
warnings.filterwarnings('ignore')
```

Normalizing Dataset

```
df = pd.read_csv('MSMT.csv')
df.head()
```

From the first five rows, we can see that data for some of the dates is missing the reason for that is on weekends and holidays Stock Market remains closed hence no trading happens on these days.

Exploratory Data Analysis

EDA is an approach to analyzing the data using visual techniques. It is used to discover trends, and patterns, or to check assumptions with the help of statistical summaries and graphical representations.

Creating X_train and y_train Data Structures.

```
plt.figure(figsize=(15,5))
plt.plot(df['Close'])
plt.title('MSMT', fontsize=15)
plt.ylabel('Price in dollars.')
plt.show()
```

There are two functions in the second layer. The first is the sigmoid function, and the second is the tanh function. The sigmoid function decides which values to let through (0 or 1). The tanh function gives the weightage to the values passed, deciding their level of importance from -1 to 1.

Reshape the Data.

```
X_train = np.reshape(X_train,(X_train.shape[0], X_train.shape[1], 1))

X_train.shape
```

```
(1198, 60, 1)
```

Building the Model by Importing the Crucial Libraries and Adding Different Layers to LSTM.

```
from keras.models import Sequential
from keras.layers import LSTM
from keras.layers import Dense
from keras.layers import Dropout
```

FITTING THE MODEL.

```
regressor.compile(optimizer = 'adam', loss = 'mean_squared_error')
regressor.fit(X_train, y_train, epochs=100, batch_size=32)
```

```
Epoch 1/100
38/38 [==============================] - 11s 114ms/step - loss: 0.1011
Epoch 2/100
38/38 [==============================] - 4s 117ms/step - loss: 0.0061
Epoch 3/100
38/38 [==============================] - 4s 118ms/step - loss: 0.0063
Epoch 4/100
```

```
dataset_test = pd.read_csv("Google_Stock_Price_Test.csv")
actual_stock_price = dataset_test.iloc[:,1:2].values
```

```
dataset_total = pd.concat((dataset_train['Open'], dataset_test['Open']), axis = 0)
inputs = dataset_total[len(dataset_total)- len(dataset_test)-60:].values

inputs = inputs.reshape(-1,1)
inputs = scaler.transform(inputs)

X_test = []
for i in range(60,80):
    X_test.append(inputs[i-60:i, 0])
X_test = np.array(X_test)
X_test = np.reshape(X_test,(X_test.shape[0], X_test.shape[1], 1))
```

```
predicted_stock_price = regressor.predict(X_test)
predicted_stock_price = scaler.inverse_transform(predicted_stock_price)
```

OUTPUT

As you can see above, the model can predict the trend of the actual stock prices very closely. The accuracy of the model can be enhanced by training with more data and increasing the LSTM layers.

```
plt.plot(actual_stock_price, color = 'red', label = 'Actual Google Stock Price')
plt.plot(predicted_stock_price, color = 'blue', label = 'Predicted Google Stock Price')
plt.title('Google Stock Price Prediction')
plt.xlabel('Time')
plt.ylabel('Google Stock Price')
plt.legend()
```

```
<matplotlib.legend.Legend at 0x7fbf71eb1b90>
```

CONCLUSION

ML applications across industries, do explore Simplilearn's Post Graduate Program in AI and Machine Learning in partnership with Purdue University, and in collaboration with IBM. This comprehensive 12-month program covers everything from Statistics, Machine Learning, Deep Learning, Reinforcement Learning, to Natural Language Programming and more. You get to learn from global experts and at the end of the program walk away with great endorsements from industry and academic leaders and a skillet that is today the most in-demand in organizations across the world.