Date: 17-10-2023

Project Title: Stock Price Prediction

Team ID: 3892

1.Importing required packages:

In [51]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import MinMaxScaler
import seaborn as sns
```

2. Loading the dataset:

In [2]:
```
data = pd.read_csv("MSFT.csv")
```

3.Display the maximum columns:

In [5]:
```
pd.options.display.max_columns = None
```

In [6]:
```
data
```

Out[6]:

	Date	Open	High	Low	Close	Adj Close	Volume
0	1986-03-13	0.088542	0.101563	0.088542	0.097222	0.062549	1031788800
1	1986-03-14	0.097222	0.102431	0.097222	0.100694	0.064783	308160000
2	1986-03-17	0.100694	0.103299	0.100694	0.102431	0.065899	133171200
3	1986-03-18	0.102431	0.103299	0.098958	0.099826	0.064224	67766400
4	1986-03-19	0.099826	0.100694	0.097222	0.098090	0.063107	47894400
...	...	...	...	...	...	...	...
8520	2019-12-31	156.770004	157.770004	156.449997	157.699997	157.699997	18369400
8521	2020-01-02	158.779999	160.729996	158.330002	160.619995	160.619995	22622100
8522	2020-01-03	158.320007	159.949997	158.059998	158.619995	158.619995	21116200
8523	2020-01-06	157.080002	159.100006	156.509995	159.029999	159.029999	20813700
8524	2020-01-07	159.320007	159.669998	157.330002	157.580002	157.580002	18017762

8525 rows × 7 columns

4.Displaying top 5 Rows of data:

In [7]:
```
data.head()
```

Out[7]:

	Date	Open	High	Low	Close	Adj Close	Volume
0	1986-03-13	0.088542	0.101563	0.088542	0.097222	0.062549	1031788800
1	1986-03-14	0.097222	0.102431	0.097222	0.100694	0.064783	308160000
2	1986-03-17	0.100694	0.103299	0.100694	0.102431	0.065899	133171200
3	1986-03-18	0.102431	0.103299	0.098958	0.099826	0.064224	67766400
4	1986-03-19	0.099826	0.100694	0.097222	0.098090	0.063107	47894400

5.Displaying last 5 rows of data:

In [9]:
```
data.tail()
```

Out[9]:

	Date	Open	High	Low	Close	Adj Close	Volume
8520	2019-12-31	156.770004	157.770004	156.449997	157.699997	157.699997	18369400
8521	2020-01-02	158.779999	160.729996	158.330002	160.619995	160.619995	22622100
8522	2020-01-03	158.320007	159.949997	158.059998	158.619995	158.619995	21116200
8523	2020-01-06	157.080002	159.100006	156.509995	159.029999	159.029999	20813700
8524	2020-01-07	159.320007	159.669998	157.330002	157.580002	157.580002	18017762

6.Shows number of rows and columns:

In [10]:
```
print("Number of columns ",data.shape[1])
print("Number of rows ",data.shape[0])
```

```
Number of columns  7
Number of rows  8525
```

7.Getting basic information about the dataset:

In [11]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8525 entries, 0 to 8524
Data columns (total 7 columns):
 #   Column     Non-Null Count  Dtype  
---  ------     --------------  -----  
 0   Date       8525 non-null   object 
 1   Open       8525 non-null   float64
 2   High       8525 non-null   float64
 3   Low        8525 non-null   float64
 4   Close      8525 non-null   float64
 5   Adj Close  8525 non-null   float64
 6   Volume     8525 non-null   int64  
dtypes: float64(5), int64(1), object(1)
memory usage: 466.3+ KB
```

8.Data Exploration:

In [13]:
```
data['Date'].unique()
```

Out[13]:
```
array(['1986-03-13', '1986-03-14', '1986-03-17', ..., '2020-01-03',
       '2020-01-06', '2020-01-07'], dtype=object)
```

In [14]:
```
data['Date'].nunique()
```

Out[14]:
```
8525
```

In [17]:
```
data['Date'].head(2)
```

Out[17]:
```
0    1986-03-13
1    1986-03-14
Name: Date, dtype: object
```

9.Checking null values presence:

In [20]:
```
data.isnull().sum()
```

Out[20]:
```
Date         0
Open         0
High         0
Low          0
Close        0
Adj Close    0
Volume       0
dtype: int64
```

10.Handling Missing Values:

In [22]:
```
data.dropna(inplace=True)
```

In [23]:
```
# Print the first 5 rows of the dataframe
print(data.head())
```

```
         Date      Open      High       Low     Close  Adj Close      Volume
0  1986-03-13  0.088542  0.101563  0.088542  0.097222   0.062549  1031788800
1  1986-03-14  0.097222  0.102431  0.097222  0.100694   0.064783   308160000
2  1986-03-17  0.100694  0.103299  0.100694  0.102431   0.065899   133171200
3  1986-03-18  0.102431  0.103299  0.098958  0.099826   0.064224    67766400
4  1986-03-19  0.099826  0.100694  0.097222  0.098090   0.063107    47894400
```

In [26]:
```
data
```

Out[26]:

	Date	Open	High	Low	Close	Adj Close	Volume
0	1986-03-13	0.088542	0.101563	0.088542	0.097222	0.062549	1031788800
1	1986-03-14	0.097222	0.102431	0.097222	0.100694	0.064783	308160000
2	1986-03-17	0.100694	0.103299	0.100694	0.102431	0.065899	133171200
3	1986-03-18	0.102431	0.103299	0.098958	0.099826	0.064224	67766400
4	1986-03-19	0.099826	0.100694	0.097222	0.098090	0.063107	47894400
...	...	...	...	...	...	...	...
8520	2019-12-31	156.770004	157.770004	156.449997	157.699997	157.699997	18369400
8521	2020-01-02	158.779999	160.729996	158.330002	160.619995	160.619995	22622100
8522	2020-01-03	158.320007	159.949997	158.059998	158.619995	158.619995	21116200
8523	2020-01-06	157.080002	159.100006	156.509995	159.029999	159.029999	20813700
8524	2020-01-07	159.320007	159.669998	157.330002	157.580002	157.580002	18017762

8525 rows × 7 columns

11.Split the dataset into features (X) and target (Y):

In [ ]:
```
X = df.drop('Date', axis=1)
Y = df['Open']
```

12.Print the shape of the training and testing sets:

In [43]:
```
print('X_train shape:', X_train.shape)
print('X_test shape:', X_test.shape)
print('Y_train shape:', Y_train.shape)
print('Y_test shape:', Y_test.shape)
```

```
X_train shape: (6820, 6)
X_test shape: (1705, 6)
Y_train shape: (6820,)
Y_test shape: (1705,)
```

13.Feature Scaling.(import StandardScaler):

In [44]:
```
import pandas as pd
from sklearn.preprocessing import StandardScaler
```

In [45]:
```
#Select the columns you want to scale
cols_to_scale = ['Open', 'High', 'Low', 'Close', 'Adj Close', 'Volume']
```

In [46]:
```
#Create a Standard Scalar object
scaler = StandardScaler()
```

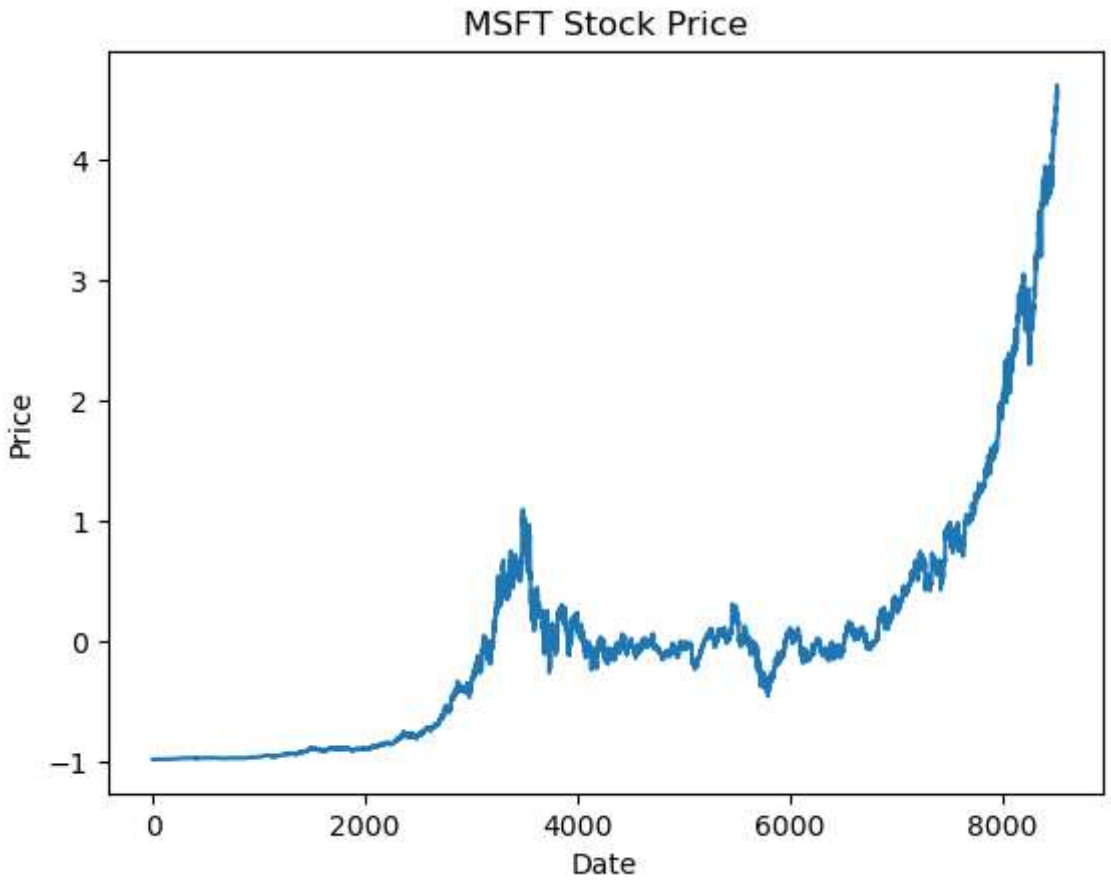
In [47]:
```
#Fit the scalar to the selected coloumn
df[cols_to_scale] = scaler.fit_transform(df[cols_to_scale])
```

In [48]:
```
print(df.head())
```

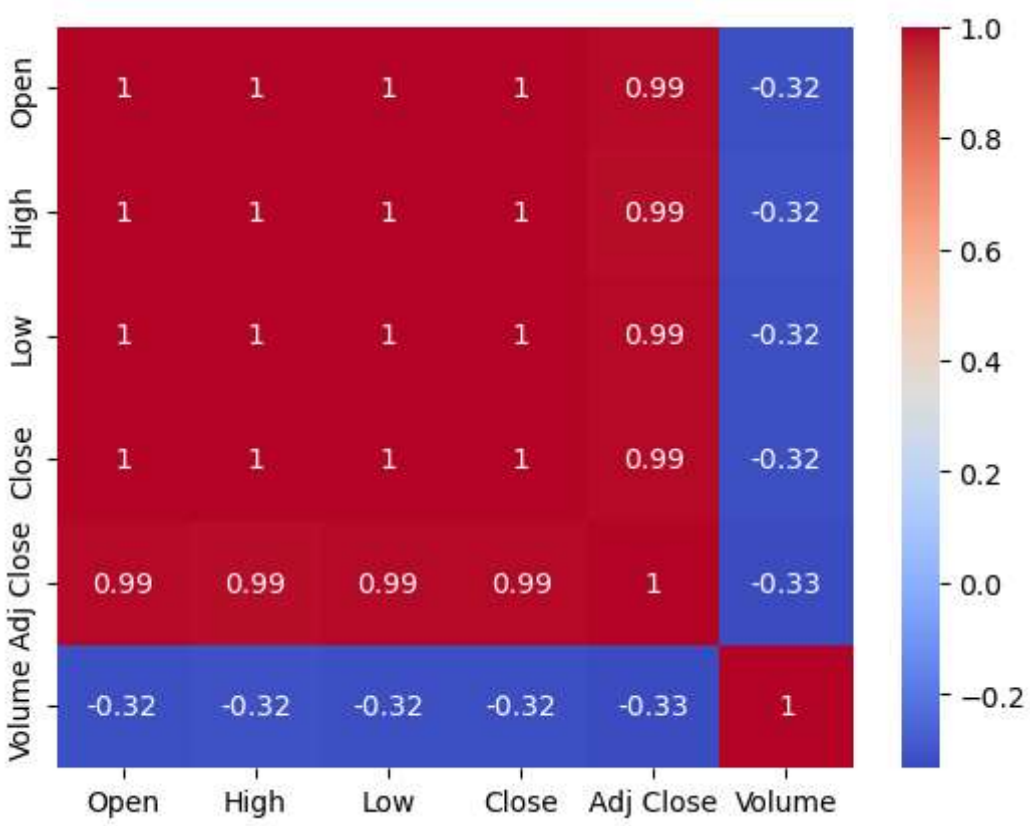
```
         Date      Open      High       Low     Close  Adj Close     Volume
0  1986-03-13 -0.982764 -0.984942 -0.981026 -0.982615  -0.828391  24.963577
1  1986-03-14 -0.982461 -0.984912 -0.980720 -0.982494  -0.828312   6.366058
2  1986-03-17 -0.982340 -0.984882 -0.980598 -0.982433  -0.828272   1.868783
3  1986-03-18 -0.982279 -0.984882 -0.980659 -0.982524  -0.828331   0.187856
4  1986-03-19 -0.982370 -0.984972 -0.980720 -0.982585  -0.828371  -0.322861
```

14.Finding relationship each column using heatmap:

In [49]:
```
# Plot the 'Close' column
plt.plot(df['Close'])
plt.title('MSFT Stock Price')
plt.xlabel('Date')
plt.ylabel('Price')
plt.show()
```



In [52]:
```
# Load the dataset into a pandas dataframe:

df = pd.read_csv('MSFT.csv', index_col=0, parse_dates=True)


# Create a correlation matrix:

corr_matrix = df.corr()


# Create a heatmap using seaborn:

sns.heatmap(corr_matrix, annot=True, cmap='coolwarm')
plt.show()
```



In [ ]:
```
```