

Exp:3

linear regression model for forecasting time series data

Aim:

Develop a linear regression model for forecasting time series data.

1. Importing Required Libraries

```
import pandas as pd
import numpy as np
from sklearn.metrics import mean_squared_error
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
import matplotlib.pyplot as plt
```

Explanation:

We import numpy (np) is used for numerical operations, pandas (pd) for data manipulation, matplotlib.pyplot (plt) for plotting.

2. Loading the Dataset

```
df=pd.read_csv("/content/cleaned_weather.csv")
```

Explanation:

We use pd.read_csv() to load a CSV file containing Gold data.

3. Describing the dataset

```
dataset.describe()
```

4. Formating the Date Column

```
dataset['Date'] = pd.to_datetime(dataset['Date'])
dataset['Year'] = dataset['Date'].dt.year
dataset['Month'] = dataset['Date'].dt.month
dataset['Day'] = dataset['Date'].dt.day
```

```
dataset['Weekday'] = dataset['Date'].dt.weekday
X = dataset[['Year', 'Month', 'Day', 'Weekday']]
y = dataset['USD (PM)']
```

5.Splitting the Dataset

```
x_train, x_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42)
y_train = y_train.fillna(y_train.mean())
y_test=y_test.fillna(y_test.mean())
```

6.Initialise the model and train the model

```
# Train the model
model = LinearRegression()
model.fit(x_train, y_train)
```

7.Fit the test set to the model

```
y_pred=model.predict(x_test)
```

8.method for prediction

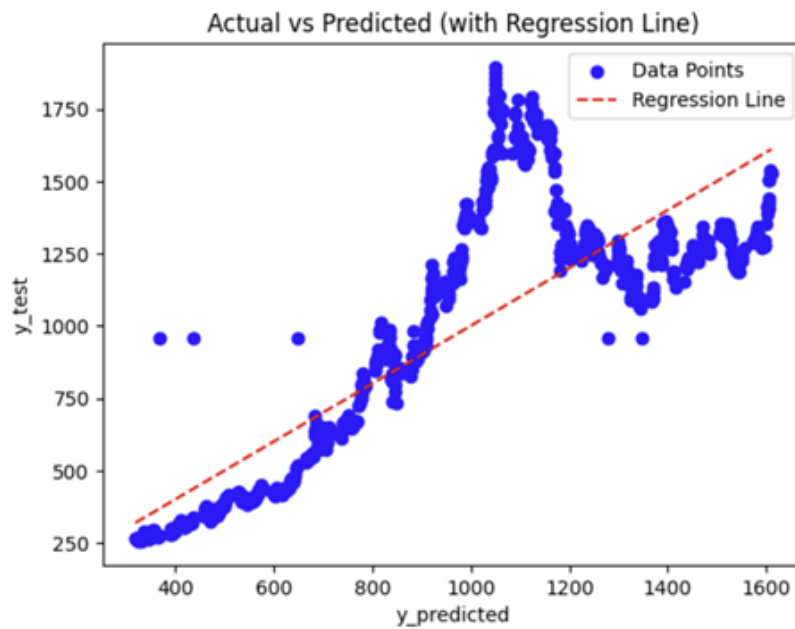
```
def predict(data):
    print(model.predict(data))
print(y_pred[0])
```

9.Calculating accuracy

```
accuracy=mean_squared_error(y_test,y_pred)
```

10.Plotting the data

```
import matplotlib.pyplot as plt
import numpy as np
plt.scatter(y_pred, y_test, color='blue', label='Data Points')
plt.plot([min(y_pred), max(y_pred)], [min(y_pred), max(y_pred)], color='red')
plt.show()
```



RESULT:

Thus a program has been implemented successfully to implement a linear regression model for time series data