Phase 2 : Innovation

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Project 4: Electricity Prices Prediction

Objective :

- The electricity price prediction task is based on a case study where you need to predict daily price of electricity based on the daily consumption of heavy machinery used by businessess.

Code :

Data Source : Utilize a dataset containing historical electricity prices and relevant factors like date, demand, supply, weather conditions, and economic indicators.

```
Load your electricity price dataset
import pandas as pd
data = pd.read_csv('Electricity.csv')
```

Data Preprocessing :

```
print(data.describe())  # Summary statistics
print(data.isnull().sum())  # Check for missing values


# Handle missing values (if any)
data.fillna(data.mean(), inplace=True)
```

```
# Remove duplicate values (if any)
data = data.drop_duplicates()
```

Feature Engineering :

```
# Time-based features
data['Date'] = pd.to_datetime(data['Date'])
data['Year'] = data['Date'].dt.year
data['Month'] = data['Date'].dt.month
data['DayOfWeek'] = data['Date'].dt.dayofweek

# Lagged variables
data['ElectricityPrice_Lag1'] = data['ElectricityPrice'].shift(1)
data['ElectricityPrice_Lag7'] = data['ElectricityPrice'].shift(7)
```

Model Selection :

```
from statsmodels.tsa.arima_model import ARIMA

# Define the ARIMA order (p, d, q)
p = 1  # Example value
d = 1  # Example value
q = 1  # Example value
```

```
# Create the ARIMA model
model = ARIMA(data['ElectricityPrice'], order=(p, d, q))

# Fit the model to the data
model_fit = model.fit()

# Print the summary of the model
print(model_fit.summary())
```

Model Training :

```
# Split the data into training and testing sets
train_size = int(len(data) * 0.8)
train, test = data['ElectricityPrice'][:train_size],
data['ElectricityPrice'][train_size:]

# Initialize and fit the ARIMA model on the training data
model = ARIMA(train, order=(p, d, q))
model_fit = model.fit()

# Print the summary of the model
print(model_fit.summary())
```

Evaluation :

```
# Make predictions on the test set
predictions = model_fit.forecast(steps=len(test))


# Calculate MAE, MSE, RMSE (import necessary libraries)
from sklearn.metrics import mean_absolute_error, mean_squared_error
import math


mae = mean_absolute_error(test, predictions)
mse = mean_squared_error(test, predictions)
rmse = math.sqrt(mse)


# Print the evaluation results
print(f'Mean Absolute Error (MAE): {mae}')
print(f'Mean Squared Error (MSE): {mse}')
print(f'Root Mean Squared Error (RMSE): {rmse}')
```

codings:

Load your electricity price dataset

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import pandas as pd
data = pd.read_csv('Electricity.csv')
```

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print(data.isnull().sum())  # Check for missing values

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# Remove duplicate values (if any)
data = data.drop_duplicates()
# Time-based features
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data['ElectricityPrice_Lag1'] = data['ElectricityPrice'].shift(1)
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```

NOTE : Run the program with compiler with csv.file