jupyter cambodia_greenpaper_price_prediction (autosaved)

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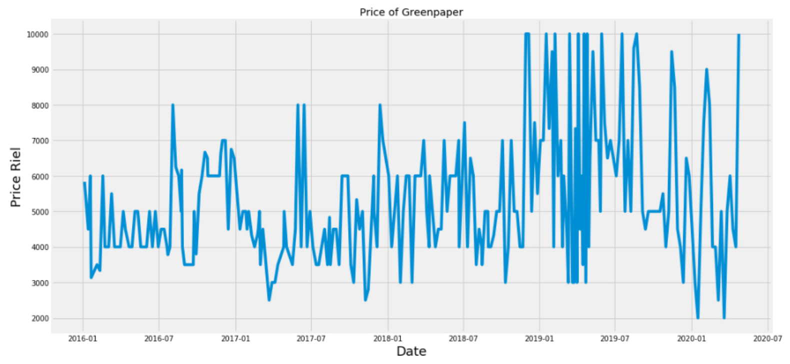
#In this program we will use LSTM to predict the agriculture product price in Cambodia

```
In [1]: #import lib
        import math
        import numpy as np
        import pandas as pd
        from sklearn.preprocessing import MinMaxScaler
        from keras.models import Sequential
        from keras.layers import Dense, LSTM
        import matplotlib.pyplot as plt
        import json
        from datetime import datetime
        plt.style.use('fivethirtyeight')

        Using TensorFlow backend.
```

```
In [2]: #get price list
        filepath = "greenpaper_price.json"
        with open(filepath, 'r') as file:
          content = file.read()

        json_content = json.loads(content)
        dates = [datetime.strptime(json_content[0]['prices'][index]['date'][0:10], "%Y-%m-%d").date() for index in range(0, len(json_con
        # dates = [json_content[0]['prices'][index]['date'][0:10] for index in range(0, len(json_content[0]['prices']))]
        prices = [float(json_content[0]['prices'][index]['price']) for index in range(0, len(json_content[0]['prices']))]

        df = pd.DataFrame(data=prices, index=dates, columns=['Prices'], dtype=None, copy=False)
```

```
In [3]: #vitualization
        plt.figure(figsize=(16, 8))
        plt.title('Price of Greenpaper')
        plt.plot(df['Prices'])
        plt.xlabel('Date', fontsize=18)
        plt.ylabel('Price Riel', fontsize=18)
        plt.show()

        C:\ProgramData\Anaconda3\lib\site-packages\pandas\plotting\_matplotlib\converter.py:103: FutureWarning: Using an implicitly reg
        istered datetime converter for a matplotlib plotting method. The converter was registered by pandas on import. Future versions
        of pandas will require you to explicitly register matplotlib converters.

        To register the converters:
                >>> from pandas.plotting import register_matplotlib_converters
                >>> register_matplotlib_converters()
          warnings.warn(msg, FutureWarning)
```



```
In [4]: #create new dataframe with only the prices column
        data = df.filter(['Prices'])
        #conver the dataframe to a numpy array
        dataset = data.values
        #get the number of rows to train model on
        training_data_len = math.ceil(len(dataset) * .8)
        training_data_len

Out[4]: 194
```

```
In [5]: #scale the data
        scaler = MinMaxScaler(feature_range=(0, 1))
        scaled_data = scaler.fit_transform(dataset)
```

```
In [6]: #create the training dataset
        #create the scaled training dataset
        train_data = scaled_data[0:training_data_len, :]
        #split the data into x_train and y_train dataset
        x_train, y_train = [], []
        for i in range(60, len(train_data)):
          x_train.append(train_data[i-60:i])
          y_train.append(train_data[i, 0])
```

```
In [7]: #convert x_train and y_train to numpy arrays
        x_train, y_train = np.array(x_train), np.array(y_train)
```

```
In [8]: #reshape the data
        x_train = np.reshape(x_train, (x_train.shape[0], x_train.shape[1], 1))
        x_train.shape

Out[8]: (134, 60, 1)
```

```
In [9]: #build the LSTM model
        model = Sequential()
        model.add(LSTM(50, return_sequences=True, input_shape=(x_train.shape[1], 1)))
        model.add(LSTM(50, return_sequences=False))
        model.add(Dense(25))
        model.add(Dense(1))
```

```
In [10]: #compile the model
         model.compile(optimizer='adam', loss='mean_squared_error')
```

```
In [11]: #train the model
         model.fit(x_train, y_train, batch_size=1, epochs=1)

         Epoch 1/1
         134/134 [==============================] - 4s 30ms/step - loss: 0.0618

Out[11]: <keras.callbacks.callbacks.History at 0x27dea56d188>
```

```
In [12]: #create the testing dataset
         #create new array containing scaled value from 143 to 203
         test_data = scaled_data[training_data_len - 60: , :]
         #create dataset x_test and y_test
         x_test, y_test = [], dataset[training_data_len: , :]
         for i in range(60, len(test_data)):
           x_test.append(test_data[i-60:i, 0])
```

```
In [13]: #convert the data to numpy array
         x_test = np.array(x_test)
```

```
In [14]: #reshape the data
         x_test = np.reshape(x_test, (x_test.shape[0], x_test.shape[1], 1))
```

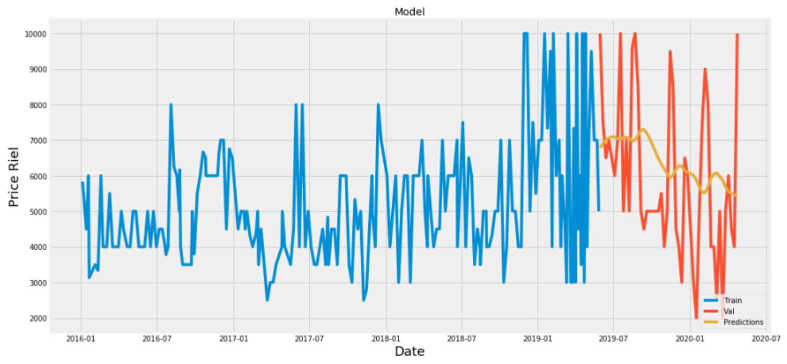
```
In [15]: #get the models predicted price values
         predictions = model.predict(x_test)
         predictions = scaler.inverse_transform(predictions)
```

```
In [16]: #get the root mean square error (RMSE)
         rmse = np.sqrt(np.mean(((predictions - y_test)**2)))
         rmse
```

```
Out[16]: 2199.4385196406333
```

```
In [17]: #plot the data
         train = data[:training_data_len]
         valid = data[training_data_len:]
         valid['Predictions'] = predictions
         #vitualize the data
         plt.figure(figsize=(16, 8))
         plt.title('Model')
         plt.xlabel('Date', fontsize=18)
         plt.ylabel('Price Riel', fontsize=18)
         plt.plot(train['Prices'])
         plt.plot(valid[['Prices', 'Predictions']])
         plt.legend(['Train', 'Val', 'Predictions'], loc='lower right')
         plt.show()
```

```
C:\ProgramData\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ver
sus-a-copy
  after removing the cwd from sys.path.
```


Model
Price Riel
Date
Train
Val
Predictions