In [1]:
```
# import libraries
import boto3, re, sys, math, json, os, sagemaker, urllib.request
from sagemaker import get_execution_role
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from IPython.display import Image
from IPython.display import display
from time import gmtime, strftime
from sagemaker.predictor import csv_serializer

# Define IAM role
role = get_execution_role()
prefix = 'sagemaker/DEMO-xgboost-dm'
my_region = boto3.session.Session().region_name # set the region of the instan

# this line automatically looks for the XGBoost image URI and builds an XGBoos
xgboost_container = sagemaker.image_uris.retrieve("xgboost", my_region, "lates

print("Success - the MySageMakerInstance is in the " + my_region + " region. Y
```

```
Success - the MySageMakerInstance is in the us-west-2 region. You will use th
e 433757028032.dkr.ecr.us-west-2.amazonaws.com/xgboost:latest container for y
our SageMaker endpoint.
```

In [2]:
```
bucket_name = 'raw-sample-file'
s3 = boto3.resource('s3')
try:
    if  my_region == 'us-east-1':
      s3.create_bucket(Bucket=bucket_name)
    else:
      s3.create_bucket(Bucket=bucket_name, CreateBucketConfiguration={ 'Locati
    print('S3 bucket created successfully')
except Exception as e:
```

```
S3 bucket created successfully
```

In [3]:
```
try:
  urllib.request.urlretrieve ("https://raw-sample-file.s3.us-west-2.amazonaws.
  print('Success: downloaded ethereum_price.csv.')
except Exception as e:
  print('Data load error: ',e)

try:
  model_data = pd.read_csv('./ethereum_price.csv',index_col=0)
  print('Success: Data loaded into dataframe.')
except Exception as e:
```

```
  Cell In[3], line 2
    urllib.request.urlretrieve ("https://raw-sample-file.s3.us-west-2.amazona
ws.com/ethereum_price.csv", "ethereum_price.csv)

^
SyntaxError: unterminated string literal (detected at line 2)
```

In [4]:
```
try:
  urllib.request.urlretrieve ("https://raw-sample-file.s3.us-west-2.amazonaws.
  print('Success: downloaded ethereum_price.csv.')
except Exception as e:
  print('Data load error: ',e)

try:
  model_data = pd.read_csv('./ethereum_price.csv',index_col=0)
  print('Success: Data loaded into dataframe.')
except Exception as e:
    print('Data load error: ',e)
```

```
Success: downloaded ethereum_price.csv.
Success: Data loaded into dataframe.
```

In [5]:

```
import pandas as pd
import datetime
import regex as re
import math
import matplotlib.pyplot as plt
import plotly.graph_objects as go
import plotly.express as px
from itertools import cycle
import numpy as np
from sklearn.metrics import mean_squared_error, mean_absolute_error, explained
from sklearn.metrics import mean_poisson_deviance, mean_gamma_deviance, accura
from sklearn.preprocessing import MinMaxScaler

import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Dropout
from tensorflow.keras.layers import LSTM, GRU

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

```
---------------------------------------------------------------------------
ModuleNotFoundError                       Traceback (most recent call last)
Cell In[5], line 14
     11 from sklearn.metrics import mean_poisson_deviance, mean_gamma_devianc
e, accuracy_score
     12 from sklearn.preprocessing import MinMaxScaler
---> 14 import tensorflow as tf
     15 from tensorflow.keras.models import Sequential
     16 from tensorflow.keras.layers import Dense, Dropout

ModuleNotFoundError: No module named 'tensorflow'
```

In [6]:

In [7]:

Out[7]:

	Date	Price	Open	High	Low	Vol.	Change %
0	8-Mar-23	1,553.49	1,561.79	1,569.70	1,548.98	498.57K	-0.53%
1	7-Mar-23	1,561.78	1,565.84	1,580.95	1,536.31	460.10K	-0.26%
2	6-Mar-23	1,565.84	1,564.36	1,581.13	1,555.43	322.16K	0.09%
3	5-Mar-23	1,564.37	1,566.73	1,587.95	1,556.84	313.01K	-0.15%
4	4-Mar-23	1,566.73	1,569.45	1,577.02	1,550.10	247.02K	-0.14%

In [8]:
```
eth['Date'] = pd.to_datetime(eth.Date)

for i in range(len(eth)):
    eth['Price'][i] = float(re.sub(',', '', eth['Price'][i]))
    eth['Open'][i] = float(re.sub(',', '', eth['Open'][i]))
    eth['High'][i] = float(re.sub(',', '', eth['High'][i]))
    eth['Low'][i] = float(re.sub(',', '', eth['Low'][i]))
    eth['Change %'][i] = float(re.sub('%', '', eth['Change %'][i]))
    if eth['Vol.'][i][-1] == 'K':
        eth['Vol.'][i] = int(float(re.sub('K', '', eth['Vol.'][i])) * 1000)
    elif eth['Vol.'][i][-1] == 'M':
        eth['Vol.'][i] = int(float(re.sub('M', '', eth['Vol.'][i])) * 1000000)
```

```
/tmp/ipykernel_7421/2147789252.py:4: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)
  eth['Price'][i] = float(re.sub(',', '', eth['Price'][i]))
/tmp/ipykernel_7421/2147789252.py:5: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)
  eth['Open'][i] = float(re.sub(',', '', eth['Open'][i]))
/tmp/ipykernel_7421/2147789252.py:6: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)
  eth['High'][i] = float(re.sub(',', '', eth['High'][i]))
/tmp/ipykernel_7421/2147789252.py:7: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)
  eth['Low'][i] = float(re.sub(',', '', eth['Low'][i]))
/tmp/ipykernel_7421/2147789252.py:8: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)
  eth['Change %'][i] = float(re.sub('%', '', eth['Change %'][i]))
/tmp/ipykernel_7421/2147789252.py:10: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame
```

```
See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)
  eth['Vol.'][i] = int(float(re.sub('K', '', eth['Vol.'][i])) * 1000)
/tmp/ipykernel_7421/2147789252.py:12: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)
  eth['Vol.'][i] = int(float(re.sub('M', '', eth['Vol.'][i])) * 1000000)
```

Out[8]:

	Date	Price	Open	High	Low	Vol.	Change %
0	2023-03-08	1553.49	1561.79	1569.7	1548.98	498570	-0.53
1	2023-03-07	1561.78	1565.84	1580.95	1536.31	460100	-0.26
2	2023-03-06	1565.84	1564.36	1581.13	1555.43	322160	0.09
3	2023-03-05	1564.37	1566.73	1587.95	1556.84	313010	-0.15
4	2023-03-04	1566.73	1569.45	1577.02	1550.1	247020	-0.14

In [9]:

Out[9]: (2555, 7)

In [10]:
```
print('Total number of days :', eth.Date.nunique())
```

```
Total number of days : 2555
Total number of fields : 7
```

In [11]:
```
print("Null values :", eth.isnull().values.sum())
```

```
Null values : 0
NA values : False
```

In [12]:
```
print("Starting date :", eth.iloc[-1][0])
print("Ending date :", eth.iloc[0][0])
```

```
Starting date : 2016-03-10 00:00:00
Ending date : 2023-03-08 00:00:00
Duration : 2554 days 00:00:00
```

In [13]:
```
monthwise = eth.groupby(pd.DatetimeIndex(eth.Date).month)[['Open']].mean()
new_order = ['January', 'February', 'March', 'April', 'May', 'June', 'July', '
             'September', 'October', 'November', 'December']
monthwise = monthwise.reset_index()
monthwise['Date'] = new_order
```

Out[13]:

	Date	Open
0	January	1012.926636
1	February	1057.254670
2	March	856.974306
3	April	897.661762
4	May	940.999447
5	June	729.158619
6	July	666.152673
7	August	857.359770
8	September	848.079286
9	October	888.357926
10	November	989.121476
11	December	971.279631

In [14]:
```
fig = go.Figure()

fig.add_trace(go.Bar(
    x = monthwise.Date,
    y = monthwise['Open'],
    name = 'Stock Open Price',
    marker_color = 'pink'
))
fig.update_layout(barmode = 'group', xaxis_tickangle = -45,
                  title = 'Monthwise comparision for Open Prices')
```

In [15]:
```
monthwise_high = eth.groupby(pd.DatetimeIndex(eth.Date).month)['High'].max()
monthwise_high = monthwise_high.reset_index()
monthwise_high['Date'] = new_order

monthwise_low = eth.groupby(pd.DatetimeIndex(eth.Date).month)['Low'].min()
monthwise_low = monthwise_low.reset_index()
```

In [16]:
```
fig = go.Figure()
fig.add_trace(go.Bar(
    x = monthwise_high.Date,
    y = monthwise_high.High,
    name = 'Stock High Price',
    marker_color = 'purple'
))
fig.add_trace(go.Bar(
    x = monthwise_low.Date,
    y = monthwise_low.Low,
    name = 'Stock Low Price',
    marker_color='pink'
))

fig.update_layout(barmode='group', xaxis_tickangle = -45,
                  title=' Monthwise High and Low Price')
```

In [17]:
```
names = cycle(['Eth Open Price','Eth High Price','Eth Low Price'])

fig = px.line(eth, x = eth.Date, y = [eth['Open'], eth['High'], eth['Low']],
              labels = {'date': 'Date','value':'Eth value'})
fig.update_layout(title_text = 'Ethereum Price analysis chart', font_size = 15
fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)

fig.show()
```

In [18]:
```
open_eth = eth[['Date', 'Open']]
print(open_eth.shape)
```

```
(2555, 2)
```

Out[18]:

	Date	Open
0	2023-03-08	1561.79
1	2023-03-07	1565.84
2	2023-03-06	1564.36
3	2023-03-05	1566.73
4	2023-03-04	1569.45

In [19]:
```
fig = px.line(open_eth, x = open_eth.Date, y = open_eth.Open,labels = {'date':
fig.update_traces(marker_line_width = 2, opacity = 0.8)
fig.update_layout(title_text = 'Stock close price chart', plot_bgcolor = 'whit
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
```

In [20]:
```
open_eth = open_eth[open_eth['Date'] > '2022-03-08']
open_stock = open_eth.copy()
```

```
Total data for prediction:  365
```

In [21]:
```
fig = px.line(open_stock, x = open_stock.Date, y = open_stock.Open, labels = {
fig.update_traces(marker_line_width = 2, opacity = 0.8, marker_line_color = 'o
fig.update_layout(title_text = 'Considered period to predict Ethereum close pr
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
fig.show()
```

In [22]:
```
del open_stock['Date']
scaler = MinMaxScaler(feature_range = (0,1))
open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))
```

```
(365, 1)
```

In [23]:
```
train_size = int(len(open_stock)*0.75)
test_size = len(open_stock) - train_size
train_data , test_data = open_stock[0:train_size, :] ,open_stock[train_size:le
print("Train_data :", train_data.shape)
```

```
Train_data : (273, 1)
Test_data : (92, 1)
```

In [24]:
```
def create_dataset(dataset, time_step = 1):
    dataX, dataY = [], []
    for i in range(len(dataset) - time_step - 1):
        a = dataset[i:(i + time_step), 0]
        dataX.append(a)
        dataY.append(dataset[i + time_step, 0])
```

In [25]:
```
time_step = 15
x_train, y_train = create_dataset(train_data, time_step)
x_test, y_test = create_dataset(test_data, time_step)

print("X_train: ", x_train.shape)
print("y_train: ", y_train.shape)
print("X_test: ", x_test.shape)
```

```
X_train:  (257, 15)
y_train:  (257,)
X_test:  (76, 15)
y_test (76,)
```

In [26]:
```
#Reshaping input to be of format [samples, time steps, features] which is reuq
x_train_lstm = x_train.reshape(x_train.shape[0], x_train.shape[1], 1)
x_test_lstm = x_test.reshape(x_test.shape[0], x_test.shape[1], 1)
```

```
(257, 15, 1) (76, 15, 1)
```

In [27]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[27], line 1
----> 1 tf.keras.backend.clear_session()
      2 model = Sequential()
      3 model.add(GRU(32, return_sequences = True, input_shape = (time_step,
1)))

NameError: name 'tf' is not defined
```

In [28]:
```
model.summary()
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[28], line 1
----> 1 model.summary()

NameError: name 'model' is not defined
```

In [29]:
```
history = model.fit(x_train_lstm, y_train, validation_data = (x_test_lstm, y_t
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[29], line 1
----> 1 history = model.fit(x_train_lstm, y_train, validation_data = (x_test_
lstm, y_test), epochs = 200, batch_size = 32, verbose = 1)

NameError: name 'model' is not defined
```

In [30]:
```
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.2)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[30], line 1
----> 1 x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.2)

NameError: name 'train_test_split' is not defined
```

In [31]:
```
pd.concat([train_data['y_yes'], train_data.drop(['y_no', 'y_yes'], axis=1)], a
boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.join(prefix,
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}/train'.for
```

```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
Cell In[31], line 1
----> 1 pd.concat([train_data['y_yes'], train_data.drop(['y_no', 'y_yes'], ax
is=1)], axis=1).to_csv('train.csv', index=False, header=False)
      2 boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.joi
n(prefix, 'train/train.csv')).upload_file('train.csv')
      3 s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}/t
rain'.format(bucket_name, prefix), content_type='csv')

IndexError: only integers, slices (`:`), ellipsis (`...`), numpy.newaxis (`No
ne`) and integer or boolean arrays are valid indices
```

In [32]:
```
pd.concat([train_data['y_yes'], train_data.drop(['y_no', 'y_yes'], axis=1)], a
boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.join(prefix,
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}/train'.for
```

```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
Cell In[32], line 1
----> 1 pd.concat([train_data['y_yes'], train_data.drop(['y_no', 'y_yes'], ax
is=1)], axis=1).to_csv('train.csv', index=False, header=False)
      2 boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.joi
n(prefix, 'train/train.csv')).upload_file('train.csv')
      3 s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}/t
rain'.format(bucket_name, prefix), content_type='csv')

IndexError: only integers, slices (`:`), ellipsis (`...`), numpy.newaxis (`No
ne`) and integer or boolean arrays are valid indices
```

In [33]:
```
train_data, test_data = np.split(model_data.sample(frac=1, random_state=1729),
```

```
(1788, 6) (767, 6)
```

In [34]:
```
boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.join(prefix,
```

```
---------------------------------------------------------------------------
FileNotFoundError                         Traceback (most recent call last)
Cell In[34], line 1
----> 1 boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.joi
n(prefix, 'train/train.csv')).upload_file('train.csv')
      2 s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}/t
rain'.format(bucket_name, prefix), content_type='csv')

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/inject.p
y:318, in object_upload_file(self, Filename, ExtraArgs, Callback, Config)
    287 def object_upload_file(
    288     self, Filename, ExtraArgs=None, Callback=None, Config=None
    289 ):
    290     """Upload a file to an S3 object.
    291
    292     Usage::
   (...)
    316         transfer.
    317     """
```

In [35]:
```
bucket_name='raw-sample-file'
boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.join(prefix,
```

```
---------------------------------------------------------------------------
FileNotFoundError                         Traceback (most recent call last)
Cell In[35], line 2
      1 bucket_name='raw-sample-file'
----> 2 boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.joi
n(prefix, 'train/train.csv')).upload_file('train.csv')
      3 s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}/t
rain'.format(bucket_name, prefix), content_type='csv')

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/inject.p
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    288     self, Filename, ExtraArgs=None, Callback=None, Config=None
    289 ):
    290     """Upload a file to an S3 object.
    291
    292     Usage::
   (...)
    316         transfer.
    317     """
```

In [36]:
```
import boto3
s3 = boto3.resource('s3')
for key in bucket.objects.all():
```

```
  Cell In[36], line 4
    print 's3://{}/{}.format(bucket,key.key)
          ^
SyntaxError: unterminated string literal (detected at line 4)
```

In [37]:
```
import boto3
s3 = boto3.resource('s3')
for key in bucket.objects.all():
```

```
  Cell In[37], line 4
    print 's3://{}.format(bucket,key.key)
          ^
SyntaxError: unterminated string literal (detected at line 4)
```

In [38]:
```
import boto3
s3 = boto3.resource('s3')
for key in bucket.objects.all():
    print key
```

```
  Cell In[38], line 4
    print key
    ^
SyntaxError: Missing parentheses in call to 'print'. Did you mean print(...)?
```

In [39]:
```
import boto3
s3 = boto3.resource('s3')
for key in bucket.objects.all():
    print(key)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[39], line 3
      1 import boto3
      2 s3 = boto3.resource('s3')
----> 3 for key in bucket.objects.all():
      4   print(key)

NameError: name 'bucket' is not defined
```

In [40]:
```
import boto3
s3 = boto3.resource('s3')
for my_bucket_object in s3.objects.all():
    print(my_bucket_object)
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[40], line 3
      1 import boto3
      2 s3 = boto3.resource('s3')
----> 3 for my_bucket_object in s3.objects.all():
      4     print(my_bucket_object)

AttributeError: 's3.ServiceResource' object has no attribute 'objects'
```

In [41]:
```
import boto3
s3 = boto3.resource('s3')
my_bucket = s3.Bucket('raw-sample-file')

for file in my_bucket.objects.all():
    print(file.key)
```

```
ethereum_price.csv
train/
```

In [42]:
```
bucket_name='raw-sample-file'
boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.join(prefix,
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3:/train'.format(buc
```

```
---------------------------------------------------------------------------
FileNotFoundError                         Traceback (most recent call last)
Cell In[42], line 2
      1 bucket_name='raw-sample-file'
----> 2 boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.joi
n(prefix, 'train/train.csv')).upload_file('train.csv')
      3 s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3:/train'.f
ormat(bucket_name, prefix), content_type='csv')

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/inject.p
y:318, in object_upload_file(self, Filename, ExtraArgs, Callback, Config)
    287 def object_upload_file(
    288     self, Filename, ExtraArgs=None, Callback=None, Config=None
    289 ):
    290     """Upload a file to an S3 object.
    291
    292     Usage::
   (...)
    316         transfer.
    317     """
```

In [43]:
```
bucket_name='raw-sample-file'
boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.join(prefix,
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}'.format(bu
```

```
---------------------------------------------------------------------------
FileNotFoundError                         Traceback (most recent call last)
Cell In[43], line 2
      1 bucket_name='raw-sample-file'
----> 2 boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.joi
n(prefix, 'train/train.csv')).upload_file('train.csv')
      3 s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}'.
format(bucket_name, prefix), content_type='csv')

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/inject.p
y:318, in object_upload_file(self, Filename, ExtraArgs, Callback, Config)
    287 def object_upload_file(
    288     self, Filename, ExtraArgs=None, Callback=None, Config=None
    289 ):
    290     """Upload a file to an S3 object.
    291
    292     Usage::
   (...)
    316         transfer.
    317     """
```

In [44]:
```
train_data, test_data = np.split(model_data.sample(frac=1, random_state=1729),
```

```
(1788, 6) (767, 6)
```

In [45]:
```
bucket_name='raw-sample-file'
boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.join(prefix,
```

```
---------------------------------------------------------------------------
FileNotFoundError                         Traceback (most recent call last)
Cell In[45], line 2
      1 bucket_name='raw-sample-file'
----> 2 boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.joi
n(prefix, 'train/train.csv')).upload_file('train.csv')
      3 s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}'.
format(bucket_name, prefix), content_type='csv')

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/inject.p
y:318, in object_upload_file(self, Filename, ExtraArgs, Callback, Config)
    287 def object_upload_file(
    288     self, Filename, ExtraArgs=None, Callback=None, Config=None
    289 ):
    290     """Upload a file to an S3 object.
    291
    292     Usage::
   (...)
    316         transfer.
    317     """
```

In [ ]:
```
bucket_name='raw-sample-file'
boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.join(prefix,
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}'.format(bu
```

In [46]:
```
sess = sagemaker.Session()
xgb = sagemaker.estimator.Estimator(xgboost_container,role, instance_count=1,
xgb.set_hyperparameters(max_depth=5,eta=0.2,gamma=4,min_child_weight=6,subsamp
```

In [47]:
```
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[47], line 1
----> 1 xgb.fit({'train': s3_input_train})

NameError: name 's3_input_train' is not defined
```

In [48]:
```
sess = sagemaker.Session()
xgb = sagemaker.estimator.Estimator(xgboost_container,role, instance_count=1,
xgb.set_hyperparameters(max_depth=5,eta=0.2,gamma=4,min_child_weight=6,subsamp
```

In [49]:
```
```

In [50]:

```
INFO:sagemaker:Creating training-job with name: xgboost-2023-05-30-09-18-24-2
32

---------------------------------------------------------------------------
ResourceLimitExceeded                     Traceback (most recent call last)
Cell In[50], line 1
----> 1 xgb.fit({'train': s3_input_train})

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/workflow
/pipeline_context.py:284, in runnable_by_pipeline.<locals>.wrapper(*args, **k
wargs)
    280         return context
    282     return _StepArguments(retrieve_caller_name(self_instance), run_fu
nc, *args, **kwargs)
--> 284 return run_func(*args, **kwargs)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/estimato
r.py:1195, in EstimatorBase.fit(self, inputs, wait, logs, job_name, experimen
t_config)
   1192 self._prepare_for_training(job_name=job_name)
   1194 experiment_config = check_and_get_run_experiment_config(experiment_co
nfig)
-> 1195 self.latest_training_job = _TrainingJob.start_new(self, inputs, exper
iment_config)
   1196 self.jobs.append(self.latest_training_job)
   1197 if wait:

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/estimato
r.py:2131, in _TrainingJob.start_new(cls, estimator, inputs, experiment_confi
g)
   2106 """Create a new Amazon SageMaker training job from the estimator.
   2107
   2108 Args:
   (...)
   2127     all information about the started training job.
   2128 """
   2129 train_args = cls._get_train_args(estimator, inputs, experiment_confi
g)
-> 2131 estimator.sagemaker_session.train(**train_args)
   2133 return cls(estimator.sagemaker_session, estimator._current_job_name)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/session.
py:848, in Session.train(self, input_mode, input_config, role, job_name, outp
ut_config, resource_config, vpc_config, hyperparameters, stop_condition, tag
s, metric_definitions, enable_network_isolation, image_uri, training_image_co
nfig, algorithm_arn, encrypt_inter_container_traffic, use_spot_instances, che
ckpoint_s3_uri, checkpoint_local_path, experiment_config, debugger_rule_confi
gs, debugger_hook_config, tensorboard_output_config, enable_sagemaker_metric
s, profiler_rule_configs, profiler_config, environment, retry_strategy)
    845     LOGGER.debug("train request: %s", json.dumps(request, indent=4))
    846     self.sagemaker_client.create_training_job(**request)
--> 848 self._intercept_create_request(train_request, submit, self.train.__na
me__)
```

```
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/session.
py:5375, in Session._intercept_create_request(self, request, create, func_nam
e)
   5358 def _intercept_create_request(
   5359     self,
   5360     request: typing.Dict,
   (...)
   5363     # pylint: disable=unused-argument
   5364 ):
   5365     """This function intercepts the create job request.
   5366
   5367     PipelineSession inherits this Session class and will override
   (...)
   5373         func_name (str): the name of the function needed intercepting
   5374     """
-> 5375     return create(request)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/session.
py:846, in Session.train.<locals>.submit(request)
    844 LOGGER.info("Creating training-job with name: %s", job_name)
    845 LOGGER.debug("train request: %s", json.dumps(request, indent=4))
--> 846 self.sagemaker_client.create_training_job(**request)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/botocore/client.p
y:530, in ClientCreator._create_api_method.<locals>._api_call(self, *args, **
kwargs)
    526     raise TypeError(
    527         f"{py_operation_name}() only accepts keyword arguments."
    528     )
    529 # The "self" in this scope is referring to the BaseClient.
--> 530 return self._make_api_call(operation_name, kwargs)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/botocore/client.p
y:960, in BaseClient._make_api_call(self, operation_name, api_params)
    958     error_code = parsed_response.get("Error", {}).get("Code")
    959     error_class = self.exceptions.from_code(error_code)
--> 960     raise error_class(parsed_response, operation_name)
    961 else:
    962     return parsed_response

ResourceLimitExceeded: An error occurred (ResourceLimitExceeded) when calling
the CreateTrainingJob operation: The account-level service limit 'ml.m4.xlarg
e for training job usage' is 0 Instances, with current utilization of 0 Insta
nces and a request delta of 1 Instances. Please use AWS Service Quotas to req
uest an increase for this quota. If AWS Service Quotas is not available, cont
act AWS support to request an increase for this quota.
```

In [1]:
```
try:
  urllib.request.urlretrieve ("https://raw-sample-file.s3.us-west-2.amazonaws.
  print('Success: downloaded 2023-06-01-13-18-37.csv.')
except Exception as e:
  print('Data load error: ',e)

try:
  model_data = pd.read_csv('./2023-06-01-13-18-37.csv',index_col=0)
  print('Success: Data loaded into dataframe.')
except Exception as e:
    print('Data load error: ',e)
```

```
Data load error:  name 'urllib' is not defined
Data load error:  name 'pd' is not defined
```

In [2]:
```
# import libraries
import boto3, re, sys, math, json, os, sagemaker, urllib.request
from sagemaker import get_execution_role
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from IPython.display import Image
from IPython.display import display
from time import gmtime, strftime
from sagemaker.predictor import csv_serializer

# Define IAM role
role = get_execution_role()
prefix = 'sagemaker/DEMO-xgboost-dm'
my_region = boto3.session.Session().region_name # set the region of the instan

# this line automatically looks for the XGBoost image URI and builds an XGBoos
xgboost_container = sagemaker.image_uris.retrieve("xgboost", my_region, "lates

print("Success - the MySageMakerInstance is in the " + my_region + " region. Y
```

```
Success - the MySageMakerInstance is in the us-west-2 region. You will use th
e 433757028032.dkr.ecr.us-west-2.amazonaws.com/xgboost:latest container for y
our SageMaker endpoint.
```

In [3]:
```
try:
  urllib.request.urlretrieve ("https://raw-sample-file.s3.us-west-2.amazonaws.
  print('Success: downloaded 2023-06-01-13-18-37.csv.')
except Exception as e:
  print('Data load error: ',e)

try:
  model_data = pd.read_csv('./2023-06-01-13-18-37.csv',index_col=0)
  print('Success: Data loaded into dataframe.')
except Exception as e:
    print('Data load error: ',e)
```

```
Success: downloaded 2023-06-01-13-18-37.csv.
Success: Data loaded into dataframe.
```

In [4]:
```
train_data, test_data = np.split(model_data.sample(frac=1, random_state=1729),
```

```
(1788, 6) (767, 6)
```

In [5]:
```
pd.to_csv('train.csv', index=False, header=False)
boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.join(prefix,
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[5], line 1
----> 1 pd.to_csv('train.csv', index=False, header=False)
      2 boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.joi
n(prefix, 'train/train.csv')).upload_file('train.csv')
      3 s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}/t
rain'.format(bucket_name, prefix), content_type='csv')

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/__init__.p
y:264, in __getattr__(name)
    260     from pandas.core.arrays.sparse import SparseArray as _SparseArray
    262     return _SparseArray
--> 264 raise AttributeError(f"module 'pandas' has no attribute '{name}'")

AttributeError: module 'pandas' has no attribute 'to_csv'
```

In [6]:
```
model_data.to_csv('train.csv', index=False, header=False)
boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.join(prefix,
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[6], line 2
      1 model_data.to_csv('train.csv', index=False, header=False)
----> 2 boto3.Session().resource('s3').Bucket(bucket_name).Object(os.path.joi
n(prefix, 'train/train.csv')).upload_file('train.csv')
      3 s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}/t
rain'.format(bucket_name, prefix), content_type='csv')

NameError: name 'bucket_name' is not defined
```

In [7]:
```
model_data.to_csv('train.csv', index=False, header=False)
boto3.Session().resource('s3').Bucket("raw-sample-data").Object(os.path.join(p
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://{}/{}/train'.for
```

```
---------------------------------------------------------------------------
ClientError                               Traceback (most recent call last)
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/transfer.
py:292, in S3Transfer.upload_file(self, filename, bucket, key, callback, extr
a_args)
    291 try:
--> 292     future.result()
    293 # If a client error was raised, add the backwards compatibility layer
    294 # that raises a S3UploadFailedError. These specific errors were only
    295 # ever thrown for upload_parts but now can be thrown for any related
    296 # client error.

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/s3transfer/future
s.py:103, in TransferFuture.result(self)
     99 try:
    100     # Usually the result() method blocks until the transfer is done,
    101     # however if a KeyboardInterrupt is raised we want want to exit
    102     # out of this and propagate the exception.
--> 103     return self._coordinator.result()
```

In [8]:
```
model_data.to_csv('train.csv', index=False, header=False)
boto3.Session().resource('s3').Bucket("raw-sample-data").Object(os.path.join(p
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://"raw-sample-data
```

```
---------------------------------------------------------------------------
ClientError                               Traceback (most recent call last)
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/transfer.
py:292, in S3Transfer.upload_file(self, filename, bucket, key, callback, extr
a_args)
    291 try:
--> 292     future.result()
    293 # If a client error was raised, add the backwards compatibility layer
    294 # that raises a S3UploadFailedError. These specific errors were only
    295 # ever thrown for upload_parts but now can be thrown for any related
    296 # client error.

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/s3transfer/future
s.py:103, in TransferFuture.result(self)
     99 try:
    100     # Usually the result() method blocks until the transfer is done,
    101     # however if a KeyboardInterrupt is raised we want want to exit
    102     # out of this and propagate the exception.
--> 103     return self._coordinator.result()
```

In [9]:
```
model_data.to_csv('train.csv', index=False, header=False)
boto3.Session().resource('s3').Bucket("raw-sample-data").Object(os.path.join(p
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://"raw-sample-data
```

```
---------------------------------------------------------------------------
ClientError                               Traceback (most recent call last)
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/transfer.
py:292, in S3Transfer.upload_file(self, filename, bucket, key, callback, extr
a_args)
    291 try:
--> 292     future.result()
    293 # If a client error was raised, add the backwards compatibility layer
    294 # that raises a S3UploadFailedError. These specific errors were only
    295 # ever thrown for upload_parts but now can be thrown for any related
    296 # client error.

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/s3transfer/future
s.py:103, in TransferFuture.result(self)
     99 try:
    100     # Usually the result() method blocks until the transfer is done,
    101     # however if a KeyboardInterrupt is raised we want want to exit
    102     # out of this and propagate the exception.
--> 103     return self._coordinator.result()
```

In [ ]:
```
boto3.Session().resource('s3').Bucket("raw-sample-data").Object(os.path.join(p
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://"raw-sample-data
```

In [10]:
```
model_data.to_csv('train.csv', index=False, header=False)
boto3.Session().resource('s3').Bucket("raw-sample-data").Object(os.path.join(p
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://"raw-sample-data
```

```
---------------------------------------------------------------------------
ClientError                               Traceback (most recent call last)
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/transfer.
py:292, in S3Transfer.upload_file(self, filename, bucket, key, callback, extr
a_args)
    291 try:
--> 292     future.result()
    293 # If a client error was raised, add the backwards compatibility layer
    294 # that raises a S3UploadFailedError. These specific errors were only
    295 # ever thrown for upload_parts but now can be thrown for any related
    296 # client error.

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/s3transfer/future
s.py:103, in TransferFuture.result(self)
     99 try:
    100     # Usually the result() method blocks until the transfer is done,
    101     # however if a KeyboardInterrupt is raised we want want to exit
    102     # out of this and propagate the exception.
--> 103     return self._coordinator.result()
```

In [11]:
```
boto3.Session().resource('s3').Bucket("raw-sample-data").Object(os.path.join(p
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://"raw-sample-data
```

```
---------------------------------------------------------------------------
ClientError                               Traceback (most recent call last)
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/transfer.
py:292, in S3Transfer.upload_file(self, filename, bucket, key, callback, extr
a_args)
    291 try:
--> 292     future.result()
    293 # If a client error was raised, add the backwards compatibility layer
    294 # that raises a S3UploadFailedError. These specific errors were only
    295 # ever thrown for upload_parts but now can be thrown for any related
    296 # client error.

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/s3transfer/future
s.py:103, in TransferFuture.result(self)
     99 try:
    100     # Usually the result() method blocks until the transfer is done,
    101     # however if a KeyboardInterrupt is raised we want want to exit
    102     # out of this and propagate the exception.
--> 103     return self._coordinator.result()
```

In [12]:
```
boto3.Session().resource('s3').Bucket("raw-sample-data").Object(os.path.join(p
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://"raw-sample-data
```

```
---------------------------------------------------------------------------
ClientError                               Traceback (most recent call last)
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/boto3/s3/transfer.
py:292, in S3Transfer.upload_file(self, filename, bucket, key, callback, extr
a_args)
    291 try:
--> 292     future.result()
    293 # If a client error was raised, add the backwards compatibility layer
    294 # that raises a S3UploadFailedError. These specific errors were only
    295 # ever thrown for upload_parts but now can be thrown for any related
    296 # client error.

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/s3transfer/future
s.py:103, in TransferFuture.result(self)
     99 try:
    100     # Usually the result() method blocks until the transfer is done,
    101     # however if a KeyboardInterrupt is raised we want want to exit
    102     # out of this and propagate the exception.
--> 103     return self._coordinator.result()
```

In [14]:
```
bucket_name = 'model_data.to_csv('train.csv', index=False, header=False)
boto3.Session().resource('s3').Bucket("raw-processed-file").Object(os.path.joi
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://"raw-processed-f
s3 = boto3.resource('s3')
try:
    if  my_region == 'us-weast-2':
      s3.create_bucket(Bucket=bucket_name)
    else:
      s3.create_bucket(Bucket=bucket_name, CreateBucketConfiguration={ 'Locati
    print('S3 bucket created successfully')
except Exception as e:
    print('S3 error: ',e)
```

```
  Cell In[14], line 1
    bucket_name = 'model_data.to_csv('train.csv', index=False, header=False)
                                                 ^
SyntaxError: unterminated string literal (detected at line 1)
```

In [15]:
```
model_data.to_csv('train.csv', index=False, header=False)
boto3.Session().resource('s3').Bucket("raw-processed-file").Object(os.path.joi
s3_input_train = sagemaker.inputs.TrainingInput(s3_data='s3://"raw-processed-f
```

In [16]:
```
sess = sagemaker.Session()
xgb = sagemaker.estimator.Estimator(xgboost_container,role, instance_count=1,
xgb.set_hyperparameters(max_depth=5,eta=0.2,gamma=4,min_child_weight=6,subsamp
```

In [17]:

```
INFO:sagemaker:Creating training-job with name: xgboost-2023-06-02-08-34-28-2
87

---------------------------------------------------------------------------
ResourceLimitExceeded                     Traceback (most recent call last)
Cell In[17], line 1
----> 1 xgb.fit({'train': s3_input_train})

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/workflow
/pipeline_context.py:284, in runnable_by_pipeline.<locals>.wrapper(*args, **k
wargs)
    280         return context
    282     return _StepArguments(retrieve_caller_name(self_instance), run_fu
nc, *args, **kwargs)
--> 284 return run_func(*args, **kwargs)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/estimato
r.py:1195, in EstimatorBase.fit(self, inputs, wait, logs, job_name, experimen
t_config)
   1192 self._prepare_for_training(job_name=job_name)
   1194 experiment_config = check_and_get_run_experiment_config(experiment_co
nfig)
-> 1195 self.latest_training_job = _TrainingJob.start_new(self, inputs, exper
iment_config)
   1196 self.jobs.append(self.latest_training_job)
   1197 if wait:

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/estimato
r.py:2131, in _TrainingJob.start_new(cls, estimator, inputs, experiment_confi
g)
   2106 """Create a new Amazon SageMaker training job from the estimator.
   2107
   2108 Args:
   (...)
   2127     all information about the started training job.
   2128 """
   2129 train_args = cls._get_train_args(estimator, inputs, experiment_confi
g)
-> 2131 estimator.sagemaker_session.train(**train_args)
   2133 return cls(estimator.sagemaker_session, estimator._current_job_name)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/session.
py:848, in Session.train(self, input_mode, input_config, role, job_name, outp
ut_config, resource_config, vpc_config, hyperparameters, stop_condition, tag
s, metric_definitions, enable_network_isolation, image_uri, training_image_co
nfig, algorithm_arn, encrypt_inter_container_traffic, use_spot_instances, che
ckpoint_s3_uri, checkpoint_local_path, experiment_config, debugger_rule_confi
gs, debugger_hook_config, tensorboard_output_config, enable_sagemaker_metric
s, profiler_rule_configs, profiler_config, environment, retry_strategy)
    845     LOGGER.debug("train request: %s", json.dumps(request, indent=4))
    846     self.sagemaker_client.create_training_job(**request)
--> 848 self._intercept_create_request(train_request, submit, self.train.__na
me__)
```

```
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/session.
py:5375, in Session._intercept_create_request(self, request, create, func_nam
e)
   5358 def _intercept_create_request(
   5359     self,
   5360     request: typing.Dict,
   (...)
   5363     # pylint: disable=unused-argument
   5364 ):
   5365     """This function intercepts the create job request.
   5366
   5367     PipelineSession inherits this Session class and will override
   (...)
   5373         func_name (str): the name of the function needed intercepting
   5374     """
-> 5375     return create(request)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sagemaker/session.
py:846, in Session.train.<locals>.submit(request)
    844 LOGGER.info("Creating training-job with name: %s", job_name)
    845 LOGGER.debug("train request: %s", json.dumps(request, indent=4))
--> 846 self.sagemaker_client.create_training_job(**request)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/botocore/client.p
y:530, in ClientCreator._create_api_method.<locals>._api_call(self, *args, **
kwargs)
    526     raise TypeError(
    527         f"{py_operation_name}() only accepts keyword arguments."
    528     )
    529 # The "self" in this scope is referring to the BaseClient.
--> 530 return self._make_api_call(operation_name, kwargs)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/botocore/client.p
y:960, in BaseClient._make_api_call(self, operation_name, api_params)
    958     error_code = parsed_response.get("Error", {}).get("Code")
    959     error_class = self.exceptions.from_code(error_code)
--> 960     raise error_class(parsed_response, operation_name)
    961 else:
    962     return parsed_response

ResourceLimitExceeded: An error occurred (ResourceLimitExceeded) when calling
the CreateTrainingJob operation: The account-level service limit 'ml.m4.xlarg
e for training job usage' is 0 Instances, with current utilization of 0 Insta
nces and a request delta of 1 Instances. Please use AWS Service Quotas to req
uest an increase for this quota. If AWS Service Quotas is not available, cont
act AWS support to request an increase for this quota.
```

In [18]:
```
df_total = pd.read_csv("./2023-06-01-13-18-37.csv")
df_total = df_total.drop("Unnamed: 0", 1)
```

```
/tmp/ipykernel_6987/2907503666.py:2: FutureWarning: In a future version of pa
ndas all arguments of DataFrame.drop except for the argument 'labels' will be
keyword-only.
  df_total = df_total.drop("Unnamed: 0", 1)

---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
Cell In[18], line 2
      1 df_total = pd.read_csv("./2023-06-01-13-18-37.csv")
----> 2 df_total = df_total.drop("Unnamed: 0", 1)
      3 df_total

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/util/_decor
ators.py:331, in deprecate_nonkeyword_arguments.<locals>.decorate.<locals>.wr
apper(*args, **kwargs)
    325 if len(args) > num_allow_args:
    326     warnings.warn(
    327         msg.format(arguments=_format_argument_list(allow_args)),
    328         FutureWarning,
    329         stacklevel=find_stack_level(),
    330     )
--> 331 return func(*args, **kwargs)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/core/frame.
py:5396, in DataFrame.drop(self, labels, axis, index, columns, level, inplac
e, errors)
   5248 @deprecate_nonkeyword_arguments(version=None, allowed_args=["self", "
labels"])
   5249 def drop(  # type: ignore[override]
   5250     self,
   (...)
   5257     errors: IgnoreRaise = "raise",
   5258 ) -> DataFrame | None:
   5259     """
   5260     Drop specified labels from rows or columns.
   5261
   (...)
   5394             weight  1.0     0.8
   5395     """
-> 5396     return super().drop(
   5397         labels=labels,
   5398         axis=axis,
   5399         index=index,
   5400         columns=columns,
   5401         level=level,
   5402         inplace=inplace,
   5403         errors=errors,
   5404     )

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/util/_decor
ators.py:331, in deprecate_nonkeyword_arguments.<locals>.decorate.<locals>.wr
apper(*args, **kwargs)
    325 if len(args) > num_allow_args:
```

```
    326     warnings.warn(
    327         msg.format(arguments=_format_argument_list(allow_args)),
    328         FutureWarning,
    329         stacklevel=find_stack_level(),
    330     )
--> 331 return func(*args, **kwargs)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/core/generi
c.py:4505, in NDFrame.drop(self, labels, axis, index, columns, level, inplac
e, errors)
   4503 for axis, labels in axes.items():
   4504     if labels is not None:
-> 4505         obj = obj._drop_axis(labels, axis, level=level, errors=error
s)
   4507 if inplace:
   4508     self._update_inplace(obj)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/core/generi
c.py:4546, in NDFrame._drop_axis(self, labels, axis, level, errors, only_slic
e)
   4544         new_axis = axis.drop(labels, level=level, errors=errors)
   4545     else:
-> 4546         new_axis = axis.drop(labels, errors=errors)
   4547     indexer = axis.get_indexer(new_axis)
   4549 # Case for non-unique axis
   4550 else:

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/core/indexe
s/base.py:6977, in Index.drop(self, labels, errors)
   6975 if mask.any():
   6976     if errors != "ignore":
-> 6977         raise KeyError(f"{list(labels[mask])} not found in axis")
   6978     indexer = indexer[~mask]
   6979 return self.delete(indexer)

KeyError: "['Unnamed: 0'] not found in axis"
```

In [19]:
```
df_total = pd.read_csv("./2023-06-01-13-18-37.csv")
```

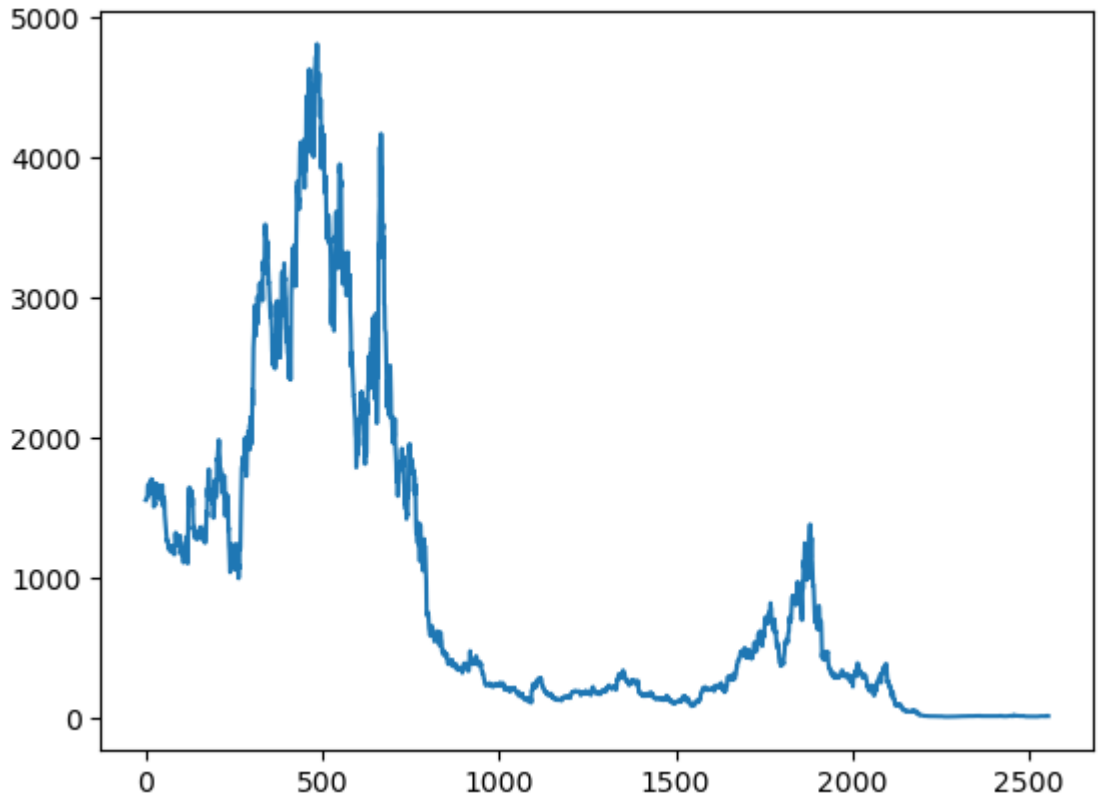
Out[19]:

	Date	Price	Open	High	Low	Vol	Change
0	8-Mar-23	1553.49	1561.79	1569.70	1548.98	498570	-0.53
1	7-Mar-23	1561.78	1565.84	1580.95	1536.31	460100	-0.26
2	6-Mar-23	1565.84	1564.36	1581.13	1555.43	322160	0.09
3	5-Mar-23	1564.37	1566.73	1587.95	1556.84	313010	-0.15
4	4-Mar-23	1566.73	1569.45	1577.02	1550.10	247020	-0.14
...	...	...	...	...	...	...	...
2550	14-Mar-16	12.50	15.07	15.07	11.40	92180	-17.05
2551	13-Mar-16	15.07	12.92	15.07	12.92	1300	16.64
2552	12-Mar-16	12.92	11.95	13.45	11.95	830	8.12
2553	11-Mar-16	11.95	11.75	11.95	11.75	180	1.7
2554	10-Mar-16	11.75	11.20	11.85	11.07	0.00K	4.91%

2555 rows × 7 columns

In [20]:
```
import matplotlib.pyplot as plt

df_total["Price"].plot()
```



In [21]:
```
import tensorflow as tf
```

```
---------------------------------------------------------------------------
ModuleNotFoundError                       Traceback (most recent call last)
Cell In[21], line 1
----> 1 import tensorflow as tf

ModuleNotFoundError: No module named 'tensorflow'
```

In [22]:
```
!conda install -c conda-forge tensorflow
```

```
Collecting package metadata (current_repodata.json): done
Solving environment: /
The environment is inconsistent, please check the package plan carefully
The following packages are causing the inconsistency:

  - conda-forge/noarch::bleach==5.0.1=pyhd8ed1ab_0
  - conda-forge/noarch::pytest==7.2.0=pyhd8ed1ab_2
  - conda-forge/noarch::python-lsp-jsonrpc==1.0.0=pyhd8ed1ab_0
  - conda-forge/noarch::qtpy==2.3.0=pyhd8ed1ab_0
  - conda-forge/linux-64::sip==6.7.5=py310hd8f1fbe_0
  - conda-forge/noarch::tqdm==4.64.1=pyhd8ed1ab_0
  - conda-forge/linux-64::watchdog==2.2.1=py310hff52083_0
  - conda-forge/noarch::dask-core==2022.11.0=pyhd8ed1ab_0
  - conda-forge/noarch::flask==2.2.2=pyhd8ed1ab_0
  - conda-forge/noarch::importlib_metadata==6.0.0=hd8ed1ab_0
  - conda-forge/noarch::nltk==3.8.1=pyhd8ed1ab_0
  - conda-forge/linux-64::pyqt5-sip==12.11.0=py310hd8f1fbe_2
  - conda-forge/noarch::python-lsp-server-base==1.7.0=pyhd8ed1ab_0
  - conda-forge/noarch::pytoolconfig==1.2.4=pyhd8ed1ab_1
  - conda-forge/noarch::qdarkstyle==3.0.3=pyhd8ed1ab_0
```

In [ ]:
```
!conda install -c conda-forge tensorflow
```

```
Collecting package metadata (current_repodata.json): done
Solving environment: /
```

In [ ]:
```
!conda install -c conda-forge tensorflow
```

In [ ]:
```
import tensorflow as tf
```

In [ ]:
```
from sklearn.preprocessing import MinMaxScaler
import numpy as np

series = df_total[[column for column in df_total.columns if column not in ["Da
series = series.applymap(lambda value: value.replace(",", "") if type(value) i
series = series.to_numpy()
scaler = MinMaxScaler()
scaler.fit(series)
```

In [1]:

```
---------------------------------------------------------------------------
ModuleNotFoundError                       Traceback (most recent call last)
Cell In[1], line 1
----> 1 import tensorflow as tf

ModuleNotFoundError: No module named 'tensorflow'
```

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [1]:

```
Collecting package metadata (current_repodata.json): done
Solving environment: -
The environment is inconsistent, please check the package plan carefully
The following packages are causing the inconsistency:

  - conda-forge/noarch::bleach==5.0.1=pyhd8ed1ab_0
  - conda-forge/noarch::pytest==7.2.0=pyhd8ed1ab_2
  - conda-forge/noarch::python-lsp-jsonrpc==1.0.0=pyhd8ed1ab_0
  - conda-forge/noarch::qtpy==2.3.0=pyhd8ed1ab_0
  - conda-forge/linux-64::sip==6.7.5=py310hd8f1fbe_0
  - conda-forge/noarch::tqdm==4.64.1=pyhd8ed1ab_0
  - conda-forge/linux-64::watchdog==2.2.1=py310hff52083_0
  - conda-forge/noarch::dask-core==2022.11.0=pyhd8ed1ab_0
  - conda-forge/noarch::flask==2.2.2=pyhd8ed1ab_0
  - conda-forge/noarch::importlib_metadata==6.0.0=hd8ed1ab_0
  - conda-forge/noarch::nltk==3.8.1=pyhd8ed1ab_0
  - conda-forge/linux-64::pyqt5-sip==12.11.0=py310hd8f1fbe_2
  - conda-forge/noarch::python-lsp-server-base==1.7.0=pyhd8ed1ab_0
  - conda-forge/noarch::pytoolconfig==1.2.4=pyhd8ed1ab_1
```

In [ ]:

```
Collecting package metadata (current_repodata.json): done
Solving environment: failed with repodata from current_repodata.json, will re
try with next repodata source.
Collecting package metadata (repodata.json): -
```

In [1]:
```
import tensorflow as ft
```

```
---------------------------------------------------------------------------
ModuleNotFoundError                       Traceback (most recent call last)
Cell In[1], line 1
----> 1 import tensorflow as ft

ModuleNotFoundError: No module named 'tensorflow'
```

In [2]:
```
!pip install tensorflow
```

```
Looking in indexes: https://pypi.org/simple, (https://pypi.org/simple,) http
s://pip.repos.neuron.amazonaws.com (https://pip.repos.neuron.amazonaws.com)
Collecting tensorflow
  Downloading tensorflow-2.12.0-cp310-cp310-manylinux_2_17_x86_64.manylinux20
14_x86_64.whl (585.9 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 585.9/585.9 MB 575.2 kB/s eta 0:0
0:0000:0100:01
Collecting gast<=0.4.0,>=0.2.1
  Downloading gast-0.4.0-py3-none-any.whl (9.8 kB)
Collecting keras<2.13,>=2.12.0
  Downloading keras-2.12.0-py2.py3-none-any.whl (1.7 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 1.7/1.7 MB 43.6 MB/s eta 0:00:0
000:01
Collecting flatbuffers>=2.0
  Downloading flatbuffers-23.5.26-py2.py3-none-any.whl (26 kB)
Requirement already satisfied: wrapt<1.15,>=1.11.0 in /home/ec2-user/anaconda
3/envs/python3/lib/python3.10/site-packages (from tensorflow) (1.14.1)
Collecting opt-einsum>=2.3.2
  Downloading opt_einsum-3.3.0-py3-none-any.whl (65 kB)
```

In [3]:
```
rom sklearn.preprocessing import MinMaxScaler
import numpy as np

series = df_total[[column for column in df_total.columns if column not in ["Da
series = series.applymap(lambda value: value.replace(",", "") if type(value) i
series = series.to_numpy()
scaler = MinMaxScaler()
series = scaler.fit_transform(series)
```

```
  Cell In[3], line 1
    rom sklearn.preprocessing import MinMaxScaler
        ^
SyntaxError: invalid syntax
```

In [4]:
```
from sklearn.preprocessing import MinMaxScaler
import numpy as np

series = df_total[[column for column in df_total.columns if column not in ["Da
series = series.applymap(lambda value: value.replace(",", "") if type(value) i
series = series.to_numpy()
scaler = MinMaxScaler()
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[4], line 4
      1 from sklearn.preprocessing import MinMaxScaler
      2 import numpy as np
----> 4 series = df_total[[column for column in df_total.columns if column no
t in ["Date(UTC)"]]]
      5 series = series.applymap(lambda value: value.replace(",", "") if type
(value) is str else value)
      6 series = series.to_numpy()

NameError: name 'df_total' is not defined
```

In [5]:
```
import matplotlib.pyplot as plt

df_total["price"].plot()
plt.show()
```

```
Matplotlib is building the font cache; this may take a moment.

---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[5], line 3
      1 import matplotlib.pyplot as plt
----> 3 df_total["price"].plot()
      4 plt.show()

NameError: name 'df_total' is not defined
```

In [6]:
```
from functools import reduce

df_total = reduce(lambda df1, df2: pd.merge(df1, df2, on='Date(UTC)'), df_list
df_total = df_total.rename(columns={"Value (Wei)": "avg gas price"})
df_total
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[6], line 3
      1 from functools import reduce
----> 3 df_total = reduce(lambda df1, df2: pd.merge(df1, df2, on='Date(UT
C)'), df_list)
      4 df_total = df_total.rename(columns={"Value (Wei)": "avg gas price"})
      5 df_total

NameError: name 'df_list' is not defined
```

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

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[7], line 1
----> 1 eth.head()

NameError: name 'eth' is not defined
```

In [8]:
```
eth = pd.read_csv('./2023-06-01-13-18-37.csv')
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[8], line 1
----> 1 eth = pd.read_csv('./2023-06-01-13-18-37.csv')

NameError: name 'pd' is not defined
```

In [9]:
```
import pandas as pd
import datetime
import regex as re
import math
import matplotlib.pyplot as plt
import plotly.graph_objects as go
import plotly.express as px
from itertools import cycle
import numpy as np
from sklearn.metrics import mean_squared_error, mean_absolute_error, explained
from sklearn.metrics import mean_poisson_deviance, mean_gamma_deviance, accura
from sklearn.preprocessing import MinMaxScaler

import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Dropout
from tensorflow.keras.layers import LSTM, GRU

import warnings
```

```
2023-06-03 15:47:36.962061: I tensorflow/core/platform/cpu_feature_guard.cc:1
82] This TensorFlow binary is optimized to use available CPU instructions in
performance-critical operations.
To enable the following instructions: AVX2 FMA, in other operations, rebuild
TensorFlow with the appropriate compiler flags.
2023-06-03 15:47:38.445465: W tensorflow/compiler/tf2tensorrt/utils/py_utils.
cc:38] TF-TRT Warning: Could not find TensorRT
```

In [10]:

In [11]:

Out[11]:

	Date	Price	Open	High	Low	Vol	Change
0	8-Mar-23	1553.49	1561.79	1569.70	1548.98	498570	-0.53
1	7-Mar-23	1561.78	1565.84	1580.95	1536.31	460100	-0.26
2	6-Mar-23	1565.84	1564.36	1581.13	1555.43	322160	0.09
3	5-Mar-23	1564.37	1566.73	1587.95	1556.84	313010	-0.15
4	4-Mar-23	1566.73	1569.45	1577.02	1550.10	247020	-0.14

In [12]:

In [13]:

Out[13]: (2555, 7)

In [14]:
```
print('Total number of days :', eth.Date.nunique())
```

```
Total number of days : 2555
Total number of fields : 7
```

In [15]:
```
print("Null values :", eth.isnull().values.sum())
```

```
Null values : 0
NA values : False
```

In [16]:
```
monthwise = eth.groupby(pd.DatetimeIndex(eth.Date).month)[['Open']].mean()
new_order = ['January', 'February', 'March', 'April', 'May', 'June', 'July', '
             'September', 'October', 'November', 'December']
monthwise = monthwise.reset_index()
monthwise['Date'] = new_order
```

Out[16]:

	Date	Open
0	January	1012.926636
1	February	1057.254670
2	March	856.974306
3	April	897.661762
4	May	940.999447
5	June	729.158619
6	July	666.152673
7	August	857.359770
8	September	848.079286
9	October	888.357926
10	November	989.121476
11	December	971.279631

In [17]:
```
fig = go.Figure()

fig.add_trace(go.Bar(
    x = monthwise.Date,
    y = monthwise['Open'],
    name = 'Stock Open Price',
    marker_color = 'pink'
))
fig.update_layout(barmode = 'group', xaxis_tickangle = -45,
                  title = 'Monthwise comparision for Open Prices')
```

In [18]:
```
monthwise_high = eth.groupby(pd.DatetimeIndex(eth.Date).month)['High'].max()
monthwise_high = monthwise_high.reset_index()
monthwise_high['Date'] = new_order

monthwise_low = eth.groupby(pd.DatetimeIndex(eth.Date).month)['Low'].min()
monthwise_low = monthwise_low.reset_index()
```

In [19]:
```
fig = go.Figure()
fig.add_trace(go.Bar(
    x = monthwise_high.Date,
    y = monthwise_high.High,
    name = 'Stock High Price',
    marker_color = 'purple'
))
fig.add_trace(go.Bar(
    x = monthwise_low.Date,
    y = monthwise_low.Low,
    name = 'Stock Low Price',
    marker_color='pink'
))

fig.update_layout(barmode='group', xaxis_tickangle = -45,
                  title=' Monthwise High and Low Price')
```

In [20]:
```
names = cycle(['Eth Open Price','Eth High Price','Eth Low Price'])

fig = px.line(eth, x = eth.Date, y = [eth['Open'], eth['High'], eth['Low']],
              labels = {'date': 'Date','value':'Eth value'})
fig.update_layout(title_text = 'Ethereum Price analysis chart', font_size = 15
fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)

fig.show()
```

In [21]:
```
names = cycle(['Etherium Open Price','Etherium High Price','Etherium Low Price

fig = px.line(eth, x = eth.Date, y = [eth['Open'], eth['High'], eth['Low']],
              labels = {'date': 'Date','value':'Eth value'})
fig.update_layout(title_text = 'Ethereum Price  variation during 2017-2023', f
fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)

fig.show()
```

In [22]:
```
open_eth = eth[['Date', 'Open']]
print(open_eth.shape)
```

```
(2555, 2)
```

Out[22]:

	Date	Open
0	2023-03-08	1561.79
1	2023-03-07	1565.84
2	2023-03-06	1564.36
3	2023-03-05	1566.73
4	2023-03-04	1569.45

In [23]:
```
fig = px.line(open_eth, x = open_eth.Date, y = open_eth.Open,labels = {'date':
fig.update_traces(marker_line_width = 2, opacity = 0.8)
fig.update_layout(title_text = 'Stock close & price chart', plot_bgcolor = 'wh
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
```

In [24]:
```
open_eth = open_eth[open_eth['Date'] > '2022-03-08']
open_stock = open_eth.copy()
```

```
Total data for prediction:  365
```

In [25]:
```
fig = px.line(open_stock, x = open_stock.Date, y = open_stock.Open, labels = {
fig.update_traces(marker_line_width = 2, opacity = 0.8, marker_line_color = 'o
fig.update_layout(title_text = 'Considered period to predict Ethereum close pr
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
fig.show()
```

In [26]:
```
del open_stock['Date']
scaler = MinMaxScaler(feature_range = (0,1))
open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))
```

```
(365, 1)
```

In [27]:
```
train_size = int(len(open_stock)*0.75)
test_size = len(open_stock) - train_size
train_data , test_data = open_stock[0:train_size, :] ,open_stock[train_size:le
print("Train_data :", train_data.shape)
```

```
Train_data : (273, 1)
Test_data : (92, 1)
```

In [28]:
```
def create_dataset(dataset, time_step = 1):
    dataX, dataY = [], []
    for i in range(len(dataset) - time_step - 1):
        a = dataset[i:(i + time_step), 0]
        dataX.append(a)
        dataY.append(dataset[i + time_step, 0])
```

In [29]:
```
time_step = 15
x_train, y_train = create_dataset(train_data, time_step)
x_test, y_test = create_dataset(test_data, time_step)

print("X_train: ", x_train.shape)
print("y_train: ", y_train.shape)
print("X_test: ", x_test.shape)
```

```
X_train:  (257, 15)
y_train:  (257,)
X_test:  (76, 15)
y_test (76,)
```

In [30]:
```
x_train_lstm = x_train.reshape(x_train.shape[0], x_train.shape[1], 1)
x_test_lstm = x_test.reshape(x_test.shape[0], x_test.shape[1], 1)
```

```
(257, 15, 1) (76, 15, 1)
```

In [31]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
2023-06-03 16:03:46.175123: E tensorflow/compiler/xla/stream_executor/cuda/cu
da_driver.cc:266] failed call to cuInit: CUDA_ERROR_NO_DEVICE: no CUDA-capabl
e device is detected

---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
Cell In[31], line 3
      1 tf.keras.backend.clear_session()
      2 model = Sequential()
----> 3 model.add(GRU(32, return_sequences = True, input_shape = (time_step,
1)))
      4 model.add(GRU(32, return_sequences = True))
      5 model.add(GRU(32))

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/tensorflow/python/
trackable/base.py:205, in no_automatic_dependency_tracking.<locals>._method_w
rapper(self, *args, **kwargs)
    203 self._self_setattr_tracking = False  # pylint: disable=protected-acce
ss
    204 try:
--> 205   result = method(self, *args, **kwargs)
    206 finally:
    207   self._self_setattr_tracking = previous_value  # pylint: disable=pro
tected-access

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceb
ack_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/backend.py:6
780, in bias_add(x, bias, data_format)
   6778 if len(bias_shape) == 1:
   6779     if data_format == "channels_first":
-> 6780         return tf.nn.bias_add(x, bias, data_format="NCHW")
   6781     return tf.nn.bias_add(x, bias, data_format="NHWC")
   6782 if ndim(x) in (3, 4, 5):

ValueError: Exception encountered when calling layer "gru" (type GRU).

Shape must be at least rank 3 but is rank 2 for '{{node BiasAdd}} = BiasAdd[T
=DT_FLOAT, data_format="NCHW"](MatMul, unstack)' with input shapes: [?,96],
[96].
```

```
Call arguments received by layer "gru" (type GRU):
  • inputs=tf.Tensor(shape=(None, 15, 1), dtype=float32)
  • mask=None
  • training=None
  • initial_state=None
```

In [32]:

```
Looking in indexes: https://pypi.org/simple, (https://pypi.org/simple,) http
s://pip.repos.neuron.amazonaws.com (https://pip.repos.neuron.amazonaws.com)
ERROR: Could not find a version that satisfies the requirement tensorflow==2.
2-rc3 (from versions: 2.8.0rc0, 2.8.0rc1, 2.8.0, 2.8.1, 2.8.2, 2.8.3, 2.8.4,
2.9.0rc0, 2.9.0rc1, 2.9.0rc2, 2.9.0, 2.9.1, 2.9.2, 2.9.3, 2.10.0rc0, 2.10.0rc
1, 2.10.0rc2, 2.10.0rc3, 2.10.0, 2.10.1, 2.11.0rc0, 2.11.0rc1, 2.11.0rc2, 2.1
1.0, 2.11.1, 2.12.0rc0, 2.12.0rc1, 2.12.0, 2.13.0rc0, 2.13.0rc1)
ERROR: No matching distribution found for tensorflow==2.2-rc3
```

In [33]:

```
ERROR: tensorflow-2.2-rc3-py3-none-any.whl is not a valid wheel filename.
Note: you may need to restart the kernel to use updated packages.
```

In [1]:

```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[1], line 1
----> 1 tf.keras.backend.clear_session()
      2 model = Sequential()
      3 model.add(GRU(32, return_sequences = True, input_shape = (time_step,
1)))

NameError: name 'tf' is not defined
```

In [2]:

```
2023-06-03 16:08:26.787795: I tensorflow/core/platform/cpu_feature_guard.cc:1
82] This TensorFlow binary is optimized to use available CPU instructions in
performance-critical operations.
To enable the following instructions: AVX2 FMA, in other operations, rebuild
TensorFlow with the appropriate compiler flags.
2023-06-03 16:08:27.802721: W tensorflow/compiler/tf2tensorrt/utils/py_utils.
cc:38] TF-TRT Warning: Could not find TensorRT
```

In [3]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[3], line 2
      1 tf.keras.backend.clear_session()
----> 2 model = Sequential()
      3 model.add(GRU(32, return_sequences = True, input_shape = (time_step,
1)))
      4 model.add(GRU(32, return_sequences = True))

NameError: name 'Sequential' is not defined
```

In [4]:

In [5]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
2023-06-03 16:09:53.116241: E tensorflow/compiler/xla/stream_executor/cuda/cu
da_driver.cc:266] failed call to cuInit: CUDA_ERROR_NO_DEVICE: no CUDA-capabl
e device is detected

---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[5], line 3
      1 tf.keras.backend.clear_session()
      2 model = Sequential()
----> 3 model.add(GRU(32, return_sequences = True, input_shape = (time_step,
1)))
      4 model.add(GRU(32, return_sequences = True))
      5 model.add(GRU(32))

NameError: name 'GRU' is not defined
```

In [6]:

In [7]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[7], line 3
      1 tf.keras.backend.clear_session()
      2 model = Sequential()
----> 3 model.add(GRU(32, return_sequences = True, input_shape = (time_step,
1)))
      4 model.add(GRU(32, return_sequences = True))
      5 model.add(GRU(32))

NameError: name 'time_step' is not defined
```

In [8]:

In [9]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
Cell In[9], line 3
      1 tf.keras.backend.clear_session()
      2 model = Sequential()
----> 3 model.add(GRU(32, return_sequences = True, input_shape = (time_step,
1)))
      4 model.add(GRU(32, return_sequences = True))
      5 model.add(GRU(32))

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/tensorflow/python/
trackable/base.py:205, in no_automatic_dependency_tracking.<locals>._method_w
rapper(self, *args, **kwargs)
    203 self._self_setattr_tracking = False  # pylint: disable=protected-acce
ss
    204 try:
--> 205   result = method(self, *args, **kwargs)
    206 finally:
    207   self._self_setattr_tracking = previous_value  # pylint: disable=pro
tected-access

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceb
ack_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/backend.py:6
780, in bias_add(x, bias, data_format)
   6778 if len(bias_shape) == 1:
   6779     if data_format == "channels_first":
-> 6780         return tf.nn.bias_add(x, bias, data_format="NCHW")
   6781     return tf.nn.bias_add(x, bias, data_format="NHWC")
   6782 if ndim(x) in (3, 4, 5):

ValueError: Exception encountered when calling layer "gru" (type GRU).

Shape must be at least rank 3 but is rank 2 for '{{node BiasAdd}} = BiasAdd[T
=DT_FLOAT, data_format="NCHW"](MatMul, unstack)' with input shapes: [?,96],
[96].

Call arguments received by layer "gru" (type GRU):
  • inputs=tf.Tensor(shape=(None, 15, 1), dtype=float32)
  • mask=None
  • training=None
```

- initial_state=None

In [10]:

In [11]:
```
import sys
```

```
Looking in indexes: https://pypi.org/simple, (https://pypi.org/simple,) http
s://pip.repos.neuron.amazonaws.com (https://pip.repos.neuron.amazonaws.com)
Requirement already satisfied: pip in /home/ec2-user/anaconda3/envs/python3/l
ib/python3.10/site-packages (22.3.1)
Collecting pip
  Downloading pip-23.1.2-py3-none-any.whl (2.1 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 2.1/2.1 MB 8.8 MB/s eta 0:00:0
0:00:0100:01
Requirement already satisfied: tensorflow in /home/ec2-user/anaconda3/envs/py
thon3/lib/python3.10/site-packages (2.12.0)
Requirement already satisfied: numpy in /home/ec2-user/anaconda3/envs/python3
/lib/python3.10/site-packages (1.22.3)
Collecting numpy
  Downloading numpy-1.24.3-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x8
6_64.whl (17.3 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 17.3/17.3 MB 14.4 MB/s eta 0:0
0:0000:0100:01
Requirement already satisfied: scikit-learn in /home/ec2-user/anaconda3/envs/
python3/lib/python3.10/site-packages (1.2.0)
```

In [12]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
2023-06-03 16:14:01.478074: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:14:01.480112: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 16:14:01.481730: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 16:14:01.720012: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:14:01.721794: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 16:14:01.723798: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 16:14:01.973573: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:14:01.975974: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
```

```
2023-06-03 16:14:01.977631: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]

---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[12], line 6
      4 model.add(GRU(32, return_sequences = True))
      5 model.add(GRU(32))
----> 6 model.add(Dropout(0.20))
      7 model.add(Dense(1))
      8 model.compile(loss = 'mean_squared_error', optimizer = 'adam')

NameError: name 'Dropout' is not defined
```

In [13]:

In [14]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
2023-06-03 16:16:48.433835: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:16:48.436016: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 16:16:48.437681: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 16:16:48.666316: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:16:48.668517: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 16:16:48.670073: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 16:16:48.902791: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:16:48.905223: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
```

```
2023-06-03 16:16:48.906912: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
```

In [15]:

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 gru (GRU)                   (None, 15, 32)            3360

 gru_1 (GRU)                 (None, 15, 32)            6336

 gru_2 (GRU)                 (None, 32)                6336

 dropout (Dropout)           (None, 32)                0

 dense (Dense)               (None, 1)                 33

=================================================================
Total params: 16,065
Trainable params: 16,065
Non-trainable params: 0
_________________________________________________________________
```

In [16]:

```
history = model.fit(x_train_lstm, y_train, validation_data = (x_test_lstm, y_t
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[16], line 1
----> 1 history = model.fit(x_train_lstm, y_train, validation_data = (x_test_
lstm, y_test), epochs = 200, batch_size = 32, verbose = 1)

NameError: name 'x_train_lstm' is not defined
```

In [17]:

```
x_train_lstm = x_train.reshape(x_train.shape[0], x_train.shape[1], 1)
x_test_lstm = x_test.reshape(x_test.shape[0], x_test.shape[1], 1)
```

```
  Cell In[17], line 4
    print(x_train_lstm.shape, x_test_lstm.shape
                                               ^
SyntaxError: incomplete input
```

In [18]:
```
x_train_lstm = x_train.reshape(x_train.shape[0], x_train.shape[1], 1)
x_test_lstm = x_test.reshape(x_test.shape[0], x_test.shape[1], 1)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[18], line 1
----> 1 x_train_lstm = x_train.reshape(x_train.shape[0], x_train.shape[1], 1)
      2 x_test_lstm = x_test.reshape(x_test.shape[0], x_test.shape[1], 1)
      4 print(x_train_lstm.shape, x_test_lstm.shape)

NameError: name 'x_train' is not defined
```

In [19]:
```
time_step = 15
x_train, y_train = create_dataset(train_data, time_step)
x_test, y_test = create_dataset(test_data, time_step)

print("X_train: ", x_train.shape)
print("y_train: ", y_train.shape)
print("X_test: ", x_test.shape)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[19], line 2
      1 time_step = 15
----> 2 x_train, y_train = create_dataset(train_data, time_step)
      3 x_test, y_test = create_dataset(test_data, time_step)
      5 print("X_train: ", x_train.shape)

NameError: name 'create_dataset' is not defined
```

In [20]:
```
train_size = int(len(open_stock)*0.75)
test_size = len(open_stock) - train_size
train_data , test_data = open_stock[0:train_size, :] ,open_stock[train_size:le
print("Train_data :", train_data.shape)
print("Test_data :", test_data.shape)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[20], line 1
----> 1 train_size = int(len(open_stock)*0.75)
      2 test_size = len(open_stock) - train_size
      3 train_data , test_data = open_stock[0:train_size, :] ,open_stock[trai
n_size:len(open_stock),:1]

NameError: name 'open_stock' is not defined
```

In [21]:
```
open_eth = open_eth[open_eth['Date'] > '2022-03-08']
open_stock = open_eth.copy()
print("Total data for prediction: ",open_stock.shape[0])
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[21], line 1
----> 1 open_eth = open_eth[open_eth['Date'] > '2022-03-08']
      2 open_stock = open_eth.copy()
      3 print("Total data for prediction: ",open_stock.shape[0])

NameError: name 'open_eth' is not defined
```

In [22]:
```
open_eth = eth[['Date', 'Open']]
print(open_eth.shape)
open_eth.head()
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[22], line 1
----> 1 open_eth = eth[['Date', 'Open']]
      2 print(open_eth.shape)
      3 open_eth.head()

NameError: name 'eth' is not defined
```

In [23]:
```
fig = px.line(open_eth, x = open_eth.Date, y = open_eth.Open,labels = {'date':
fig.update_traces(marker_line_width = 2, opacity = 0.8)
fig.update_layout(title_text = 'Stock close & price chart', plot_bgcolor = 'wh
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[23], line 1
----> 1 fig = px.line(open_eth, x = open_eth.Date, y = open_eth.Open,labels =
{'date':'Date','close':'Close Time'})
      2 fig.update_traces(marker_line_width = 2, opacity = 0.8)
      3 fig.update_layout(title_text = 'Stock close & price chart', plot_bgco
lor = 'white', font_size = 15, font_color = 'yellow')

NameError: name 'px' is not defined
```

In [ ]:

In [ ]:
```
fig = px.line(open_eth, x = open_eth.Date, y = open_eth.Open,labels = {'date':

fig.update_traces(marker_line_width = 2, opacity = 0.8)

fig.update_layout(title_text = 'Stock close & price chart', plot_bgcolor = 'wh

fig.update_xaxes(showgrid = False)

fig.update_yaxes(showgrid = False)

fig.show()
```

In [26]:
```
open_eth = eth[['Date', 'Open']]
print(open_eth.shape)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[26], line 1
----> 1 open_eth = eth[['Date', 'Open']]
      2 print(open_eth.shape)
      3 open_eth.head()

NameError: name 'eth' is not defined
```

In [27]:
```

```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[27], line 1
----> 1 eth = pd.read_csv('./2023-06-01-13-18-37.csv')

NameError: name 'pd' is not defined
```

In [28]:
```
import pandas as pd
import datetime
import regex as re
import math
import matplotlib.pyplot as plt
import plotly.graph_objects as go
import plotly.express as px
from itertools import cycle
import numpy as np
from sklearn.metrics import mean_squared_error, mean_absolute_error, explained
from sklearn.metrics import mean_poisson_deviance, mean_gamma_deviance, accura
from sklearn.preprocessing import MinMaxScaler

import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Dropout
from tensorflow.keras.layers import LSTM, GRU

import warnings
```

```
---------------------------------------------------------------------------
RuntimeError                              Traceback (most recent call last)
RuntimeError: module compiled against API version 0x10 but this version of nu
mpy is 0xf


---------------------------------------------------------------------------
ImportError                               Traceback (most recent call last)
Cell In[28], line 10
      8 from itertools import cycle
      9 import numpy as np
---> 10 from sklearn.metrics import mean_squared_error, mean_absolute_error,
explained_variance_score, r2_score
     11 from sklearn.metrics import mean_poisson_deviance, mean_gamma_devianc
e, accuracy_score
     12 from sklearn.preprocessing import MinMaxScaler

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/__init__.p
y:82
     80 from . import _distributor_init  # noqa: F401
     81 from . import __check_build  # noqa: F401
---> 82 from .base import clone
     83 from .utils._show_versions import show_versions
     85 __all__ = [
     86     "calibration",
     87     "cluster",
   (...)
    128     "show_versions",
    129 ]

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/base.py:17
     15 from . import __version__
     16 from ._config import get_config
---> 17 from .utils import _IS_32BIT
     18 from .utils._set_output import _SetOutputMixin
     19 from .utils._tags import (
```

```
     20     _DEFAULT_TAGS,
     21 )

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/utils/__in
it__.py:25
     23 from .deprecation import deprecated
     24 from .discovery import all_estimators
---> 25 from .fixes import parse_version, threadpool_info
     26 from ._estimator_html_repr import estimator_html_repr
     27 from .validation import (
     28     as_float_array,
     29     assert_all_finite,
   (...)
     38     _is_arraylike_not_scalar,
     39 )

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/utils/fixe
s.py:19
     17 import numpy as np
     18 import scipy
---> 19 import scipy.stats
     20 import threadpoolctl
     22 from .deprecation import deprecated

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/scipy/stats/__init
__.py:485
      1 """
      2 .. _statsrefmanual:
      3
   (...)
    480
    481 """
    483 from ._warnings_errors import (ConstantInputWarning, NearConstantInpu
tWarning,
    484                                DegenerateDataWarning, FitError)
--> 485 from ._stats_py import *
    486 from ._variation import variation
    487 from .distributions import *

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/scipy/stats/_stats
_py.py:37
     35 from numpy import array, asarray, ma
     36 from numpy.lib import NumpyVersion
---> 37 from numpy.testing import suppress_warnings
     39 from scipy.spatial.distance import cdist
     40 from scipy.ndimage import _measurements

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/numpy/testing/__in
it__.py:10
      1 """Common test support for all numpy test scripts.
      2
      3 This single module should provide all the common functionality for nu
mpy tests
   (...)
      6
      7 """
```

```
      8 from unittest import TestCase
---> 10 from ._private.utils import *
     11 from ._private.utils import (_assert_valid_refcount, _gen_alignment_d
ata)
     12 from ._private import extbuild, decorators as dec

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/numpy/testing/_pri
vate/utils.py:23
     20 import numpy as np
     21 from numpy.core import(
     22      intp, float32, empty, arange, array_repr, ndarray, isnat, array)
---> 23 import numpy.linalg.lapack_lite
     25 from io import StringIO
     27 __all__ = [
     28         'assert_equal', 'assert_almost_equal', 'assert_approx_equal',
     29         'assert_array_equal', 'assert_array_less', 'assert_string_equ
al',
   (...)
     38         'assert_no_gc_cycles', 'break_cycles', 'HAS_LAPACK64', 'IS_PY
STON',
     39         ]

ImportError: numpy.core.multiarray failed to import
```

In [29]:

In [30]:

In [31]:

Out[31]:

	Date	Price	Open	High	Low	Vol	Change
0	8-Mar-23	1553.49	1561.79	1569.70	1548.98	498570	-0.53
1	7-Mar-23	1561.78	1565.84	1580.95	1536.31	460100	-0.26
2	6-Mar-23	1565.84	1564.36	1581.13	1555.43	322160	0.09
3	5-Mar-23	1564.37	1566.73	1587.95	1556.84	313010	-0.15
4	4-Mar-23	1566.73	1569.45	1577.02	1550.10	247020	-0.14

In [32]:

In [33]:
```
names = cycle(['Etherium Open Price','Etherium High Price','Etherium Low Price

fig = px.line(eth, x = eth.Date, y = [eth['Open'], eth['High'], eth['Low']],
              labels = {'date': 'Date','value':'Eth value'})
fig.update_layout(title_text = 'Ethereum Price  variation during 2017-2023', f
fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)

fig.show()
```

In [34]:
```
open_eth = eth[['Date', 'Open']]
print(open_eth.shape)
open_eth.head()
```

```
(2555, 2)
```

Out[34]:

	Date	Open
0	2023-03-08	1561.79
1	2023-03-07	1565.84
2	2023-03-06	1564.36
3	2023-03-05	1566.73
4	2023-03-04	1569.45

In [35]:
```
monthwise_high = eth.groupby(pd.DatetimeIndex(eth.Date).month)['High'].max()
monthwise_high = monthwise_high.reset_index()
monthwise_high['Date'] = new_order

monthwise_low = eth.groupby(pd.DatetimeIndex(eth.Date).month)['Low'].min()
monthwise_low = monthwise_low.reset_index()
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[35], line 3
      1 monthwise_high = eth.groupby(pd.DatetimeIndex(eth.Date).month)['High
'].max()
      2 monthwise_high = monthwise_high.reset_index()
----> 3 monthwise_high['Date'] = new_order
      5 monthwise_low = eth.groupby(pd.DatetimeIndex(eth.Date).month)['Low'].
min()
      6 monthwise_low = monthwise_low.reset_index()

NameError: name 'new_order' is not defined
```

In [36]:
```
print("Null values :", eth.isnull().values.sum())
print("NA values :", eth.isna().values.any())



monthwise = eth.groupby(pd.DatetimeIndex(eth.Date).month)[['Open']].mean()
new_order = ['January', 'February', 'March', 'April', 'May', 'June', 'July', '
             'September', 'October', 'November', 'December']
monthwise = monthwise.reset_index()
monthwise['Date'] = new_order
```

```
Null values : 0
NA values : False
```

Out[36]:

	Date	Open
0	January	1012.926636
1	February	1057.254670
2	March	856.974306
3	April	897.661762
4	May	940.999447
5	June	729.158619
6	July	666.152673
7	August	857.359770
8	September	848.079286
9	October	888.357926
10	November	989.121476
11	December	971.279631

In [37]:
```
monthwise_high = eth.groupby(pd.DatetimeIndex(eth.Date).month)['High'].max()
monthwise_high = monthwise_high.reset_index()
monthwise_high['Date'] = new_order

monthwise_low = eth.groupby(pd.DatetimeIndex(eth.Date).month)['Low'].min()
monthwise_low = monthwise_low.reset_index()
monthwise_low['Date'] = new_order
```

In [38]:
```
fig = px.line(open_eth, x = open_eth.Date, y = open_eth.Open,labels = {'date':
fig.update_traces(marker_line_width = 2, opacity = 0.8)
fig.update_layout(title_text = 'Stock close & price chart', plot_bgcolor = 'wh
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
```

In [39]:
```
open_eth = open_eth[open_eth['Date'] > '2022-03-08']
open_stock = open_eth.copy()
```

```
Total data for prediction:  365
```

In [40]:
```
fig = px.line(open_stock, x = open_stock.Date, y = open_stock.Open, labels = {
fig.update_traces(marker_line_width = 2, opacity = 0.8, marker_line_color = 'o
fig.update_layout(title_text = 'Considered period to predict Ethereum close pr
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
fig.show()
```

In [41]:
```
del open_stock['Date']
scaler = MinMaxScaler(feature_range = (0,1))
open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))
print(open_stock.shape)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[41], line 2
      1 del open_stock['Date']
----> 2 scaler = MinMaxScaler(feature_range = (0,1))
      3 open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))
      4 print(open_stock.shape)

NameError: name 'MinMaxScaler' is not defined
```

In [42]:

```
---------------------------------------------------------------------------
RuntimeError                              Traceback (most recent call last)
RuntimeError: module compiled against API version 0x10 but this version of nu
mpy is 0xf


---------------------------------------------------------------------------
ImportError                               Traceback (most recent call last)
Cell In[42], line 1
----> 1 from sklearn.preprocessing import MinMaxScaler

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/__init__.p
y:82
     80 from . import _distributor_init  # noqa: F401
     81 from . import __check_build  # noqa: F401
---> 82 from .base import clone
     83 from .utils._show_versions import show_versions
     85 __all__ = [
     86     "calibration",
     87     "cluster",
   (...)
    128     "show_versions",
    129 ]

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/base.py:17
     15 from . import __version__
     16 from ._config import get_config
---> 17 from .utils import _IS_32BIT
     18 from .utils._set_output import _SetOutputMixin
     19 from .utils._tags import (
     20     _DEFAULT_TAGS,
     21 )

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/utils/__in
it__.py:25
     23 from .deprecation import deprecated
     24 from .discovery import all_estimators
---> 25 from .fixes import parse_version, threadpool_info
     26 from ._estimator_html_repr import estimator_html_repr
     27 from .validation import (
     28     as_float_array,
     29     assert_all_finite,
   (...)
     38     _is_arraylike_not_scalar,
     39 )

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/utils/fixe
s.py:19
     17 import numpy as np
     18 import scipy
---> 19 import scipy.stats
     20 import threadpoolctl
     22 from .deprecation import deprecated
```

```
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/scipy/stats/__init
__.py:485
      1 """
      2 .. _statsrefmanual:
      3
   (...)
    480
    481 """
    483 from ._warnings_errors import (ConstantInputWarning, NearConstantInpu
tWarning,
    484                                DegenerateDataWarning, FitError)
--> 485 from ._stats_py import *
    486 from ._variation import variation
    487 from .distributions import *

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/scipy/stats/_stats
_py.py:37
     35 from numpy import array, asarray, ma
     36 from numpy.lib import NumpyVersion
---> 37 from numpy.testing import suppress_warnings
     39 from scipy.spatial.distance import cdist
     40 from scipy.ndimage import _measurements

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/numpy/testing/__in
it__.py:10
      1 """Common test support for all numpy test scripts.
      2
      3 This single module should provide all the common functionality for nu
mpy tests
   (...)
      6
      7 """
      8 from unittest import TestCase
---> 10 from ._private.utils import *
     11 from ._private.utils import (_assert_valid_refcount, _gen_alignment_d
ata)
     12 from ._private import extbuild, decorators as dec

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/numpy/testing/_pri
vate/utils.py:23
     20 import numpy as np
     21 from numpy.core import(
     22      intp, float32, empty, arange, array_repr, ndarray, isnat, array)
---> 23 import numpy.linalg.lapack_lite
     25 from io import StringIO
     27 __all__ = [
     28         'assert_equal', 'assert_almost_equal', 'assert_approx_equal',
     29         'assert_array_equal', 'assert_array_less', 'assert_string_equ
al',
   (...)
     38         'assert_no_gc_cycles', 'break_cycles', 'HAS_LAPACK64', 'IS_PY
STON',
     39         ]

ImportError: numpy.core.multiarray failed to import
```

In [43]:

```
Looking in indexes: https://pypi.org/simple, (https://pypi.org/simple,) http
s://pip.repos.neuron.amazonaws.com (https://pip.repos.neuron.amazonaws.com)
Requirement already satisfied: numpy in /home/ec2-user/anaconda3/envs/python3
/lib/python3.10/site-packages (1.23.5)
Collecting numpy
  Using cached numpy-1.24.3-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x
86_64.whl (17.3 MB)
Installing collected packages: numpy
  Attempting uninstall: numpy
    Found existing installation: numpy 1.23.5
    Uninstalling numpy-1.23.5:
      Successfully uninstalled numpy-1.23.5
ERROR: pip's dependency resolver does not currently take into account all the
packages that are installed. This behaviour is the source of the following de
pendency conflicts.
numba 0.56.4 requires numpy<1.24,>=1.18, but you have numpy 1.24.3 which is i
ncompatible.
sparkmagic 0.20.3 requires nest-asyncio==1.5.5, but you have nest-asyncio 1.
5.6 which is incompatible.
tensorflow 2.12.0 requires numpy<1.24,>=1.22, but you have numpy 1.24.3 which
is incompatible.
Successfully installed numpy-1.24.3
Note: you may need to restart the kernel to use updated packages.
```

In [44]:
```
del open_stock['Date']
scaler = MinMaxScaler(feature_range = (0,1))
open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/core/indexes/base.py:3803, in get_loc(self, key, method, tolerance)
   3801     return self._get_indexer(target, method, limit, tolerance)
-> 3803 def _get_indexer(
   3804     self,
   3805     target: Index,
   3806     method: str_t | None = None,
   3807     limit: int | None = None,
   3808     tolerance=None,
   3809 ) -> npt.NDArray[np.intp]:
   3810     if tolerance is not None:

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/_libs/index.pyx:138, in pandas._libs.index.IndexEngine.get_loc()

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/_libs/index.pyx:165, in pandas._libs.index.IndexEngine.get_loc()

File pandas/_libs/hashtable_class_helper.pxi:5745, in pandas._libs.hashtable.PyObjectHashTable.get_item()

File pandas/_libs/hashtable_class_helper.pxi:5753, in pandas._libs.hashtable.PyObjectHashTable.get_item()

KeyError: 'Date'

The above exception was the direct cause of the following exception:

KeyError                                  Traceback (most recent call last)
Cell In[44], line 1
----> 1 del open_stock['Date']
      2 scaler = MinMaxScaler(feature_range = (0,1))
      3 open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/core/generic.py:4243, in __delitem__(self, key)
   4226     t = (
   4227         "\n"
   4228         "A value is trying to be set on a copy of a slice from a "
   (...)
   4232         "indexing.html#returning-a-view-versus-a-copy"
   4233     )
   4235 else:
   4236     t = (
   4237         "\n"
   4238         "A value is trying to be set on a copy of a slice from a "
   4239         "DataFrame.\n"
   4240         "Try using .loc[row_indexer,col_indexer] = value "
   4241         "instead\n\nSee the caveats in the documentation: "
   4242         "https://pandas.pydata.org/pandas-docs/stable/user_guide/"
```

```
-> 4243         "indexing.html#returning-a-view-versus-a-copy"
   4244     )
   4246 if value == "raise":
   4247     raise SettingWithCopyError(t)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/core/indexe
s/base.py:3805, in get_loc(self, key, method, tolerance)
   3797         return this._get_indexer(
   3798             target, method=method, limit=limit, tolerance=tolerance
   3799         )
   3801     return self._get_indexer(target, method, limit, tolerance)
   3803 def _get_indexer(
   3804     self,
-> 3805     target: Index,
   3806     method: str_t | None = None,
   3807     limit: int | None = None,
   3808     tolerance=None,
   3809 ) -> npt.NDArray[np.intp]:
   3810     if tolerance is not None:
   3811         tolerance = self._convert_tolerance(tolerance, target)

KeyError: 'Date'
```

In [45]:
```
import pandas as pd
import datetime
import regex as re
import math
import matplotlib.pyplot as plt
import plotly.graph_objects as go
import plotly.express as px
from itertools import cycle
import numpy as np
from sklearn.metrics import mean_squared_error, mean_absolute_error, explained
from sklearn.metrics import mean_poisson_deviance, mean_gamma_deviance, accura
from sklearn.preprocessing import MinMaxScaler

import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Dropout
```

```
---------------------------------------------------------------------------
RuntimeError                              Traceback (most recent call last)
RuntimeError: module compiled against API version 0x10 but this version of nu
mpy is 0xf


---------------------------------------------------------------------------
ImportError                               Traceback (most recent call last)
Cell In[45], line 10
      8 from itertools import cycle
      9 import numpy as np
---> 10 from sklearn.metrics import mean_squared_error, mean_absolute_error,
explained_variance_score, r2_score
     11 from sklearn.metrics import mean_poisson_deviance, mean_gamma_devianc
e, accuracy_score
     12 from sklearn.preprocessing import MinMaxScaler

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/__init__.p
y:82
     80 from . import _distributor_init  # noqa: F401
     81 from . import __check_build  # noqa: F401
---> 82 from .base import clone
     83 from .utils._show_versions import show_versions
     85 __all__ = [
     86     "calibration",
     87     "cluster",
   (...)
    128     "show_versions",
    129 ]

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/base.py:17
     15 from . import __version__
     16 from ._config import get_config
---> 17 from .utils import _IS_32BIT
     18 from .utils._set_output import _SetOutputMixin
     19 from .utils._tags import (
     20     _DEFAULT_TAGS,
     21 )
```

```
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/utils/__in
it__.py:25
     23 from .deprecation import deprecated
     24 from .discovery import all_estimators
---> 25 from .fixes import parse_version, threadpool_info
     26 from ._estimator_html_repr import estimator_html_repr
     27 from .validation import (
     28     as_float_array,
     29     assert_all_finite,
   (...)
     38     _is_arraylike_not_scalar,
     39 )

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/utils/fixe
s.py:19
     17 import numpy as np
     18 import scipy
---> 19 import scipy.stats
     20 import threadpoolctl
     22 from .deprecation import deprecated

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/scipy/stats/__init
__.py:485
      1 """
      2 .. _statsrefmanual:
      3
   (...)
    480
    481 """
    483 from ._warnings_errors import (ConstantInputWarning, NearConstantInpu
tWarning,
    484                                DegenerateDataWarning, FitError)
--> 485 from ._stats_py import *
    486 from ._variation import variation
    487 from .distributions import *

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/scipy/stats/_stats
_py.py:37
     35 from numpy import array, asarray, ma
     36 from numpy.lib import NumpyVersion
---> 37 from numpy.testing import suppress_warnings
     39 from scipy.spatial.distance import cdist
     40 from scipy.ndimage import _measurements

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/numpy/testing/__in
it__.py:11
      8 from unittest import TestCase
     10 from . import _private
---> 11 from ._private.utils import *
     12 from ._private.utils import (_assert_valid_refcount, _gen_alignment_d
ata)
     13 from ._private import extbuild, decorators as dec

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/numpy/testing/_pri
vate/utils.py:23
     20 import numpy as np
```

```
     21 from numpy.core import(
     22      intp, float32, empty, arange, array_repr, ndarray, isnat, array)
---> 23 import numpy.linalg.lapack_lite
     25 from io import StringIO
     27 __all__ = [
     28         'assert_equal', 'assert_almost_equal', 'assert_approx_equal',
     29         'assert_array_equal', 'assert_array_less', 'assert_string_equ
al',
   (...)
     39         '_OLD_PROMOTION'
     40         ]

ImportError: numpy.core.multiarray failed to import
```

In [46]:

```
Looking in indexes: https://pypi.org/simple, (https://pypi.org/simple,) http
s://pip.repos.neuron.amazonaws.com (https://pip.repos.neuron.amazonaws.com)
Requirement already satisfied: numpy in /home/ec2-user/anaconda3/envs/python3
/lib/python3.10/site-packages (1.24.3)
Note: you may need to restart the kernel to use updated packages.
```

In [47]:
```
del open_stock['Date']
scaler = MinMaxScaler(feature_range = (0,1))
open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))
print(open_stock.shape)
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/core/indexe
s/base.py:3803, in get_loc(self, key, method, tolerance)
   3801     return self._get_indexer(target, method, limit, tolerance)
-> 3803 def _get_indexer(
   3804     self,
   3805     target: Index,
   3806     method: str_t | None = None,
   3807     limit: int | None = None,
   3808     tolerance=None,
   3809 ) -> npt.NDArray[np.intp]:
   3810     if tolerance is not None:

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/_libs/inde
x.pyx:138, in pandas._libs.index.IndexEngine.get_loc()

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/_libs/inde
x.pyx:165, in pandas._libs.index.IndexEngine.get_loc()

File pandas/_libs/hashtable_class_helper.pxi:5745, in pandas._libs.hashtable.
PyObjectHashTable.get_item()

File pandas/_libs/hashtable_class_helper.pxi:5753, in pandas._libs.hashtable.
PyObjectHashTable.get_item()

KeyError: 'Date'

The above exception was the direct cause of the following exception:

KeyError                                  Traceback (most recent call last)
Cell In[47], line 1
----> 1 del open_stock['Date']
      2 scaler = MinMaxScaler(feature_range = (0,1))
      3 open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/core/generi
c.py:4243, in __delitem__(self, key)
   4226     t = (
   4227         "\n"
   4228         "A value is trying to be set on a copy of a slice from a "
   (...)
   4232         "indexing.html#returning-a-view-versus-a-copy"
   4233     )
   4235 else:
   4236     t = (
   4237         "\n"
   4238         "A value is trying to be set on a copy of a slice from a "
   4239         "DataFrame.\n"
   4240         "Try using .loc[row_indexer,col_indexer] = value "
   4241         "instead\n\nSee the caveats in the documentation: "
```

```
   4242         "https://pandas.pydata.org/pandas-docs/stable/user_guide/"
-> 4243         "indexing.html#returning-a-view-versus-a-copy"
   4244     )
   4246 if value == "raise":
   4247     raise SettingWithCopyError(t)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/core/indexe
s/base.py:3805, in get_loc(self, key, method, tolerance)
   3797         return this._get_indexer(
   3798             target, method=method, limit=limit, tolerance=tolerance
   3799         )
   3801     return self._get_indexer(target, method, limit, tolerance)
   3803 def _get_indexer(
   3804     self,
-> 3805     target: Index,
   3806     method: str_t | None = None,
   3807     limit: int | None = None,
   3808     tolerance=None,
   3809 ) -> npt.NDArray[np.intp]:
   3810     if tolerance is not None:
   3811         tolerance = self._convert_tolerance(tolerance, target)

KeyError: 'Date'
```

In [1]:
```
del open_stock['Date']
scaler = MinMaxScaler(feature_range = (0,1))
open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[1], line 1
----> 1 del open_stock['Date']
      2 scaler = MinMaxScaler(feature_range = (0,1))
      3 open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))

NameError: name 'open_stock' is not defined
```

In [2]:
```
import pandas as pd
import datetime
import regex as re
import math
import matplotlib.pyplot as plt
import plotly.graph_objects as go
import plotly.express as px
from itertools import cycle
import numpy as np
from sklearn.metrics import mean_squared_error, mean_absolute_error, explained
from sklearn.metrics import mean_poisson_deviance, mean_gamma_deviance, accura
from sklearn.preprocessing import MinMaxScaler

import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Dropout
from tensorflow.keras.layers import LSTM, GRU

import warnings
warnings.filterwarnings('ignore')



eth = pd.read_csv('./2023-06-01-13-18-37.csv')


eth.head()


eth['Date'] = pd.to_datetime(eth.Date)



print('Total number of days :', eth.Date.nunique())
print('Total number of fields :', eth.shape[1])




print("Null values :", eth.isnull().values.sum())
print("NA values :", eth.isna().values.any())



monthwise = eth.groupby(pd.DatetimeIndex(eth.Date).month)[['Open']].mean()
new_order = ['January', 'February', 'March', 'April', 'May', 'June', 'July', '
             'September', 'October', 'November', 'December']
monthwise = monthwise.reset_index()
monthwise['Date'] = new_order

monthwise
```

```
fig = go.Figure()
fig.add_trace(go.Bar(
    x = monthwise_high.Date,
    y = monthwise_high.High,
    name = 'Stock High Price',
    marker_color = 'purple'
))
fig.add_trace(go.Bar(
    x = monthwise_low.Date,
    y = monthwise_low.Low,
    name = 'Stock Low Price',
    marker_color='pink'
))

fig.update_layout(barmode='group', xaxis_tickangle = -45,
                  title=' Monthwise High and Low Price')
fig.show()
```

```
names = cycle(['Etherium Open Price','Etherium High Price','Etherium Low Price

fig = px.line(eth, x = eth.Date, y = [eth['Open'], eth['High'], eth['Low']],
              labels = {'date': 'Date','value':'Eth value'})
fig.update_layout(title_text = 'Ethereum Price  variation during 2017-2023', f
fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)

fig.show()
```

```
open_eth = eth[['Date', 'Open']]
print(open_eth.shape)
open_eth.head()
```

```
monthwise_high = eth.groupby(pd.DatetimeIndex(eth.Date).month)['High'].max()
monthwise_high = monthwise_high.reset_index()
monthwise_high['Date'] = new_order

monthwise_low = eth.groupby(pd.DatetimeIndex(eth.Date).month)['Low'].min()
monthwise_low = monthwise_low.reset_index()
monthwise_low['Date'] = new_order
```

```
fig = px.line(open_eth, x = open_eth.Date, y = open_eth.Open,labels = {'date':
fig.update_traces(marker_line_width = 2, opacity = 0.8)
fig.update_layout(title_text = 'Stock close & price chart', plot_bgcolor = 'wh
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
fig.show()
```

```
open_eth = open_eth[open_eth['Date'] > '2022-03-08']
open_stock = open_eth.copy()
print("Total data for prediction: ",open_stock.shape[0])
```

```
fig = px.line(open_stock, x = open_stock.Date, y = open_stock.Open, labels = {
fig.update_traces(marker_line_width = 2, opacity = 0.8, marker_line_color = 'o
fig.update_layout(title_text = 'Considered period to predict Ethereum close pr
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
fig.show()
```

```
del open_stock['Date']
scaler = MinMaxScaler(feature_range = (0,1))
open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))
print(open_stock.shape)
```

```
#check training data

train_size = int(len(open_stock)*0.75)
test_size = len(open_stock) - train_size
train_data , test_data = open_stock[0:train_size, :] ,open_stock[train_size:le
print("Train_data :", train_data.shape)
print("Test_data :", test_data.shape)
```

```
def create_dataset(dataset, time_step = 1):
    dataX, dataY = [], []
    for i in range(len(dataset) - time_step - 1):
        a = dataset[i:(i + time_step), 0]
        dataX.append(a)
        dataY.append(dataset[i + time_step, 0])
    return np.array(dataX), np.array(dataY)
```

```
time_step = 15
x_train, y_train = create_dataset(train_data, time_step)
x_test, y_test = create_dataset(test_data, time_step)

print("X_train: ", x_train.shape)
print("y_train: ", y_train.shape)
print("X_test: ", x_test.shape)
print("y_test", y_test.shape)



#start training



x_train_lstm = x_train.reshape(x_train.shape[0], x_train.shape[1], 1)
x_test_lstm = x_test.reshape(x_test.shape[0], x_test.shape[1], 1)

print(x_train_lstm.shape, x_test_lstm.shape


#dealing with GRU related issue
#from keras.models import Sequential
#import tensorflow as tf

#from tensorflow.keras.layers import LSTM, GRU

#tf.keras.backend.set_image_data_format("channels_last")

#import sys
#!{sys.executable} -m pip install --upgrade pip tensorflow numpy scikit-learn



tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
model.compile(loss = 'mean_squared_error', optimizer = 'adam')
```

```
  Cell In[12], line 190
    print(x_train_lstm.shape, x_test_lstm.shape
          ^
SyntaxError: '(' was never closed
```

In [3]:
```
import pandas as pd
import datetime
import regex as re
import math
import matplotlib.pyplot as plt
import plotly.graph_objects as go
import plotly.express as px
from itertools import cycle
import numpy as np
from sklearn.metrics import mean_squared_error, mean_absolute_error, explained
from sklearn.metrics import mean_poisson_deviance, mean_gamma_deviance, accura
from sklearn.preprocessing import MinMaxScaler

import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Dropout
from tensorflow.keras.layers import LSTM, GRU

import warnings
warnings.filterwarnings('ignore')



eth = pd.read_csv('./2023-06-01-13-18-37.csv')


eth.head()


eth['Date'] = pd.to_datetime(eth.Date)



print('Total number of days :', eth.Date.nunique())
print('Total number of fields :', eth.shape[1])




print("Null values :", eth.isnull().values.sum())
print("NA values :", eth.isna().values.any())



monthwise = eth.groupby(pd.DatetimeIndex(eth.Date).month)[['Open']].mean()
new_order = ['January', 'February', 'March', 'April', 'May', 'June', 'July', '
             'September', 'October', 'November', 'December']
monthwise = monthwise.reset_index()
monthwise['Date'] = new_order

monthwise
```

```
fig = go.Figure()
fig.add_trace(go.Bar(
    x = monthwise_high.Date,
    y = monthwise_high.High,
    name = 'Stock High Price',
    marker_color = 'purple'
))
fig.add_trace(go.Bar(
    x = monthwise_low.Date,
    y = monthwise_low.Low,
    name = 'Stock Low Price',
    marker_color='pink'
))

fig.update_layout(barmode='group', xaxis_tickangle = -45,
                  title=' Monthwise High and Low Price')
fig.show()
```

```
names = cycle(['Etherium Open Price','Etherium High Price','Etherium Low Price

fig = px.line(eth, x = eth.Date, y = [eth['Open'], eth['High'], eth['Low']],
              labels = {'date': 'Date','value':'Eth value'})
fig.update_layout(title_text = 'Ethereum Price  variation during 2017-2023', f
fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)

fig.show()
```

```
open_eth = eth[['Date', 'Open']]
print(open_eth.shape)
open_eth.head()
```

```
monthwise_high = eth.groupby(pd.DatetimeIndex(eth.Date).month)['High'].max()
monthwise_high = monthwise_high.reset_index()
monthwise_high['Date'] = new_order

monthwise_low = eth.groupby(pd.DatetimeIndex(eth.Date).month)['Low'].min()
monthwise_low = monthwise_low.reset_index()
monthwise_low['Date'] = new_order
```

```
fig = px.line(open_eth, x = open_eth.Date, y = open_eth.Open,labels = {'date':
fig.update_traces(marker_line_width = 2, opacity = 0.8)
fig.update_layout(title_text = 'Stock close & price chart', plot_bgcolor = 'wh
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
fig.show()
```

```
open_eth = open_eth[open_eth['Date'] > '2022-03-08']
open_stock = open_eth.copy()
print("Total data for prediction: ",open_stock.shape[0])
```

```
fig = px.line(open_stock, x = open_stock.Date, y = open_stock.Open, labels = {
fig.update_traces(marker_line_width = 2, opacity = 0.8, marker_line_color = 'o
fig.update_layout(title_text = 'Considered period to predict Ethereum close pr
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
fig.show()
```

```
del open_stock['Date']
scaler = MinMaxScaler(feature_range = (0,1))
open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))
print(open_stock.shape)
```

```
#check training data

train_size = int(len(open_stock)*0.75)
test_size = len(open_stock) - train_size
train_data , test_data = open_stock[0:train_size, :] ,open_stock[train_size:le
print("Train_data :", train_data.shape)
print("Test_data :", test_data.shape)
```

```
def create_dataset(dataset, time_step = 1):
    dataX, dataY = [], []
    for i in range(len(dataset) - time_step - 1):
        a = dataset[i:(i + time_step), 0]
        dataX.append(a)
        dataY.append(dataset[i + time_step, 0])
    return np.array(dataX), np.array(dataY)
```

```
time_step = 15
x_train, y_train = create_dataset(train_data, time_step)
x_test, y_test = create_dataset(test_data, time_step)

print("X_train: ", x_train.shape)
print("y_train: ", y_train.shape)
print("X_test: ", x_test.shape)
print("y_test", y_test.shape)
```

```
#start training
```

```
x_train_lstm = x_train.reshape(x_train.shape[0], x_train.shape[1], 1)
x_test_lstm = x_test.reshape(x_test.shape[0], x_test.shape[1], 1)

print(x_train_lstm.shape, x_test_lstm.shape)
```

```
#dealing with GRU related issue
#from keras.models import Sequential
#import tensorflow as tf

#from tensorflow.keras.layers import LSTM, GRU

#tf.keras.backend.set_image_data_format("channels_last")

#import sys
#!{sys.executable} -m pip install --upgrade pip tensorflow numpy scikit-learn
```

```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
model.compile(loss='mean_squared_error', optimizer='adam')
```

```
2023-06-03 16:31:53.321626: I tensorflow/core/platform/cpu_feature_guard.cc:1
82] This TensorFlow binary is optimized to use available CPU instructions in
performance-critical operations.
To enable the following instructions: AVX2 FMA, in other operations, rebuild
TensorFlow with the appropriate compiler flags.
2023-06-03 16:31:54.499708: W tensorflow/compiler/tf2tensorrt/utils/py_utils.
cc:38] TF-TRT Warning: Could not find TensorRT

Total number of days : 2555
Total number of fields : 7
Null values : 0
```

```
NA values : False
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[3], line 60
     54 monthwise
     58 fig = go.Figure()
     59 fig.add_trace(go.Bar(
---> 60     x = monthwise_high.Date,
     61     y = monthwise_high.High,
     62     name = 'Stock High Price',
     63     marker_color = 'purple'
     64 ))
     65 fig.add_trace(go.Bar(
     66     x = monthwise_low.Date,
     67     y = monthwise_low.Low,
     68     name = 'Stock Low Price',
     69     marker_color='pink'
     70 ))
     72 fig.update_layout(barmode='group', xaxis_tickangle = -45,
     73                   title=' Monthwise High and Low Price')

NameError: name 'monthwise_high' is not defined
```

In [4]:
```
fig = go.Figure()
fig.add_trace(go.Bar(
    x = monthwise_high.Date,
    y = monthwise_high.High,
    name = 'Stock High Price',
    marker_color = 'purple'
))
fig.add_trace(go.Bar(
    x = monthwise_low.Date,
    y = monthwise_low.Low,
    name = 'Stock Low Price',
    marker_color='pink'
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[4], line 3
      1 fig = go.Figure()
      2 fig.add_trace(go.Bar(
----> 3     x = monthwise_high.Date,
      4     y = monthwise_high.High,
      5     name = 'Stock High Price',
      6     marker_color = 'purple'
      7 ))
      8 fig.add_trace(go.Bar(
      9     x = monthwise_low.Date,
     10     y = monthwise_low.Low,
     11     name = 'Stock Low Price',
     12     marker_color='pink'
     13 ))

NameError: name 'monthwise_high' is not defined
```

In [5]:
```
monthwise_high = eth.groupby(pd.DatetimeIndex(eth.Date).month)['High'].max()
monthwise_high = monthwise_high.reset_index()
monthwise_high['Date'] = new_order

monthwise_low = eth.groupby(pd.DatetimeIndex(eth.Date).month)['Low'].min()
monthwise_low = monthwise_low.reset_index()
```

In [6]:
```
fig = go.Figure()
fig.add_trace(go.Bar(
    x = monthwise_high.Date,
    y = monthwise_high.High,
    name = 'Stock High Price',
    marker_color = 'purple'
))
fig.add_trace(go.Bar(
    x = monthwise_low.Date,
    y = monthwise_low.Low,
    name = 'Stock Low Price',
    marker_color='pink'
))

fig.update_layout(barmode='group', xaxis_tickangle = -45,
                  title=' Monthwise High and Low Price')
```

In [7]:
```
names = cycle(['Eth Open Price','Eth High Price','Eth Low Price'])

fig = px.line(eth, x = eth.Date, y = [eth['Open'], eth['High'], eth['Low']],
              labels = {'date': 'Date','value':'Eth value'})
fig.update_layout(title_text = 'Ethereum Price analysis chart', font_size = 15
fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)

fig.show()
```

In [8]:
```
open_eth = eth[['Date', 'Open']]
print(open_eth.shape)
```

```
(2555, 2)
```

Out[8]:

	Date	Open
0	2023-03-08	1561.79
1	2023-03-07	1565.84
2	2023-03-06	1564.36
3	2023-03-05	1566.73
4	2023-03-04	1569.45

In [9]:
```
fig = px.line(open_eth, x = open_eth.Date, y = open_eth.Open,labels = {'date':
fig.update_traces(marker_line_width = 2, opacity = 0.8)
fig.update_layout(title_text = 'Stock close price chart', plot_bgcolor = 'whit
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
```

In [10]:
```
open_eth = open_eth[open_eth['Date'] > '2022-03-08']
open_stock = open_eth.copy()
```

```
Total data for prediction:  365
```

In [11]:
```
fig = px.line(open_stock, x = open_stock.Date, y = open_stock.Open, labels = {
fig.update_traces(marker_line_width = 2, opacity = 0.8, marker_line_color = 'o
fig.update_layout(title_text = 'Considered period to predict Ethereum close pr
fig.update_xaxes(showgrid = False)
fig.update_yaxes(showgrid = False)
fig.show()
```

In [12]:
```
del open_stock['Date']
scaler = MinMaxScaler(feature_range = (0,1))
open_stock = scaler.fit_transform(np.array(open_stock).reshape(-1,1))
```

```
(365, 1)
```

In [13]:
```
train_size = int(len(open_stock)*0.75)
test_size = len(open_stock) - train_size
train_data , test_data = open_stock[0:train_size, :] ,open_stock[train_size:le
print("Train_data :", train_data.shape)
```

```
Train_data : (273, 1)
Test_data : (92, 1)
```

In [14]:
```
def create_dataset(dataset, time_step = 1):
    dataX, dataY = [], []
    for i in range(len(dataset) - time_step - 1):
        a = dataset[i:(i + time_step), 0]
        dataX.append(a)
        dataY.append(dataset[i + time_step, 0])
```

In [15]:
```
time_step = 15
x_train, y_train = create_dataset(train_data, time_step)
x_test, y_test = create_dataset(test_data, time_step)

print("X_train: ", x_train.shape)
print("y_train: ", y_train.shape)
print("X_test: ", x_test.shape)
```

```
X_train:  (257, 15)
y_train:  (257,)
X_test:  (76, 15)
y_test (76,)
```

In [ ]:
```
x_train_lstm = x_train.reshape(x_train.shape[0], x_train.shape[1], 1)
x_test_lstm = x_test.reshape(x_test.shape[0], x_test.shape[1], 1)
```

In [16]:
```
x_train_lstm = x_train.reshape(x_train.shape[0], x_train.shape[1], 1)
x_test_lstm = x_test.reshape(x_test.shape[0], x_test.shape[1], 1)
```

```
(257, 15, 1) (76, 15, 1)
```

In [17]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
2023-06-03 16:36:17.657759: E tensorflow/compiler/xla/stream_executor/cuda/cu
da_driver.cc:266] failed call to cuInit: CUDA_ERROR_NO_DEVICE: no CUDA-capabl
e device is detected

---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
Cell In[17], line 3
      1 tf.keras.backend.clear_session()
      2 model = Sequential()
----> 3 model.add(GRU(32, return_sequences = True, input_shape = (time_step,
1)))
      4 model.add(GRU(32, return_sequences = True))
      5 model.add(GRU(32))

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/tensorflow/python/
trackable/base.py:205, in no_automatic_dependency_tracking.<locals>._method_w
rapper(self, *args, **kwargs)
    203 self._self_setattr_tracking = False  # pylint: disable=protected-acce
ss
    204 try:
--> 205   result = method(self, *args, **kwargs)
    206 finally:
    207   self._self_setattr_tracking = previous_value  # pylint: disable=pro
tected-access

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceb
ack_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/backend.py:6
780, in bias_add(x, bias, data_format)
   6778 if len(bias_shape) == 1:
   6779     if data_format == "channels_first":
-> 6780         return tf.nn.bias_add(x, bias, data_format="NCHW")
   6781     return tf.nn.bias_add(x, bias, data_format="NHWC")
   6782 if ndim(x) in (3, 4, 5):

ValueError: Exception encountered when calling layer "gru" (type GRU).

Shape must be at least rank 3 but is rank 2 for '{{node BiasAdd}} = BiasAdd[T
=DT_FLOAT, data_format="NCHW"](MatMul, unstack)' with input shapes: [?,96],
[96].
```

```
Call arguments received by layer "gru" (type GRU):
  • inputs=tf.Tensor(shape=(None, 15, 1), dtype=float32)
  • mask=None
  • training=None
  • initial_state=None
```

In [18]:

In [19]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
2023-06-03 16:36:58.718575: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:36:58.720509: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 16:36:58.722557: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 16:36:58.964635: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:36:58.966807: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 16:36:58.968353: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 16:36:59.198863: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:36:59.200679: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
```

```
2023-06-03 16:36:59.202521: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
```

In [20]:

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 gru (GRU)                   (None, 15, 32)            3360

 gru_1 (GRU)                 (None, 15, 32)            6336

 gru_2 (GRU)                 (None, 32)                6336

 dropout (Dropout)           (None, 32)                0

 dense (Dense)               (None, 1)                 33

=================================================================
Total params: 16,065
Trainable params: 16,065
Non-trainable params: 0
_________________________________________________________________
```

In [21]:

```
history = model.fit(x_train_lstm, y_train, validation_data = (x_test_lstm, y_t
```

```
Epoch 1/200

2023-06-03 16:38:19.455062: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:38:19.457301: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 16:38:19.458935: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
```

In [22]:
```
train_predict = model.predict(x_train)
test_predict = model.predict(x_test)
```

```
2023-06-03 16:40:10.196806: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:40:10.198963: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 16:40:10.200499: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 16:40:10.423737: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:40:10.426108: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 16:40:10.427777: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 16:40:10.652401: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 16:40:10.654526: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 16:40:10.656194: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
```

```
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]

9/9 [==============================] - 1s 5ms/step
3/3 [==============================] - 0s 6ms/step
(257, 1) (76, 1)
```

In [23]:
```
train_predict = scaler.inverse_transform(train_predict)
test_predict = scaler.inverse_transform(test_predict)
original_ytrain = scaler.inverse_transform(y_train.reshape(-1,1))
```

In [24]:
```
print("Train data RMSE: ", math.sqrt(mean_squared_error(original_ytrain,train_
print("Train data MSE: ", mean_squared_error(original_ytrain,train_predict))
print("Train data MAE: ", mean_absolute_error(original_ytrain,train_predict))
print("-------------------------------------------------------------------------
print("Test data RMSE: ", math.sqrt(mean_squared_error(original_ytest,test_pre
print("Test data MSE: ", mean_squared_error(original_ytest,test_predict))
```

```
Train data RMSE:  66.55752062072685
Train data MSE:  4429.9035511784805
Train data MAE:  49.60936037056177
-------------------------------------------------------------------------------
--------
Test data RMSE:  251.4173785608084
Test data MSE:  63210.69824238884
Test data MAE:  218.62690076326066
```

In [25]:
```
print("Train data explained variance regression score:", explained_variance_sc
```

```
  Cell In[25], line 2
    print("Test data explained variance regression score:", explained_varianc
e_score(original_ytest, test_predict)

    ^
SyntaxError: incomplete input
```

In [26]:
```
print("Train data explained variance regression score:", explained_variance_sc
```

```
Train data explained variance regression score: 0.9070347090908348
Test data explained variance regression score: 0.901903546931152
```

In [27]:
```
print("Train data explained variance regression score:", explained_variance_sc
```

```
Train data explained variance regression score: 0.9070347090908348
Test data explained variance regression score: 0.901903546931152
```

In [28]:
```
print("Train data MGD: ", mean_gamma_deviance(original_ytrain, train_predict))
print("Test data MGD: ", mean_gamma_deviance(original_ytest, test_predict))
print("----------------------------------------------------------------------")
print("Train data MPD: ", mean_poisson_deviance(original_ytrain, train_predict
```

```
Train data MGD:  0.0023031705954778834
Test data MGD:  0.008451328288976392
----------------------------------------------------------------------
Train data MPD:  3.163801210026853
Test data MPD:  22.918403221058085
```

In [29]:
```
look_back = time_step
train_predict_plot = np.empty_like(open_stock)
train_predict_plot[:, :] = np.nan
train_predict_plot[look_back : len(train_predict) + look_back, :] = train_pred
print("Train predicted data: ", train_predict_plot.shape)

# shift test predictions for plotting
test_predict_plot = np.empty_like(open_stock)
test_predict_plot[:, :] = np.nan
test_predict_plot[len(train_predict) + (look_back * 2) + 1:len(open_stock) - 1
print("Test predicted data: ", test_predict_plot.shape)

names = cycle(['Original Open price','Train predicted Open price','Test predic

plotdf = pd.DataFrame({'Date': open_eth['Date'],
                       'original_open': open_eth['Open'],
                      'train_predicted_open': train_predict_plot.reshape(1,-1)
                      'test_predicted_open': test_predict_plot.reshape(1,-1)[0
plotdf['original_open'] = plotdf['original_open'].astype(np.float64)

fig = px.line(plotdf, x = plotdf['Date'], y = [plotdf['original_open'], plotdf
              labels = {'value':'Ethereum price','Date': 'Date'})
fig.update_layout(title_text = 'Comparision between original Open price vs pre
                  plot_bgcolor = 'white', font_size = 15, font_color = 'black'
fig.for_each_trace(lambda t:  t.update(name = next(names)))

fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)
fig.show()
```

```
Train predicted data:  (365, 1)
Test predicted data:  (365, 1)
```

In [30]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 45
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[30], line 32
     29 else:
     31     x_input = x_input.reshape((1, n_steps,1))
---> 32     yhat = model.predict(x_input, verbose=0)
     33     temp_input.extend(yhat[0].tolist())
     35     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [31]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[31], line 32
     29 else:
     31     x_input = x_input.reshape((1, n_steps,1))
---> 32     yhat = model.predict(x_input, verbose=0)
     33     temp_input.extend(yhat[0].tolist())
     35     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [32]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()
```

In [33]:
```
```

In [34]:
```
lst_output=[]
n_steps=time_step
i=0
```

In [35]:
```
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[35], line 22
     19 else:
     21     x_input = x_input.reshape((1, n_steps,1))
---> 22     yhat = model.predict(x_input, verbose=0)
     23     temp_input.extend(yhat[0].tolist())
     25     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb

File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(self), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:
```

```
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [36]:
```
print(test_data)
```

```
[[0.32370025]
 [0.34228541]
 [0.32095246]
 [0.3203546 ]
 [0.3087458 ]
 [0.33225639]
 [0.3256522 ]
 [0.37468078]
 [0.39711047]
 [0.32390217]
 [0.31546481]
 [0.28870755]
 [0.31583699]
 [0.37510839]
 [0.38956396]
 [0.38703394]
 [0.41482062]
 [0.38786936]
 [0.38179968]
 [0.4053855 ]
 [0.36366588]
 [0.43377005]
 [0.4068267 ]
 [0.45547122]
 [0.4200232 ]
 [0.40150138]
 [0.38013676]
 [0.43223382]
 [0.53323673]
 [0.48866241]
 [0.60359825]
 [0.64954646]
 [0.67207117]
 [0.69372087]
 [0.77017583]
 [0.70713118]
 [0.73664414]
 [0.72462357]
 [0.68564381]
 [0.72125416]
 [0.76871484]
 [0.74970998]
 [0.71859348]
 [0.7960462 ]
 [0.76278374]
 [0.76669161]
 [0.77900517]
 [0.78728417]
 [0.82376953]
 [0.83395693]
 [0.81577166]
 [0.78931927]
 [0.81699905]
 [0.81028796]
```

```
[0.8023376 ]
[0.84006224]
[0.80459838]
[0.78512236]
[0.87362957]
[0.8964354 ]
[0.87028392]
[0.88425645]
[0.86079733]
[0.9547328 ]
[0.99967929]
[1.        ]
[0.96879244]
[0.97427217]
[0.90543895]
[0.94632711]
[0.95276501]
[0.92418249]
[0.91074448]
[0.8514414 ]
[0.83460626]
[0.8375243 ]
[0.80797966]
[0.78163418]
[0.75066022]
[0.73888117]
[0.7738699 ]
[0.76980366]
[0.71933388]
[0.70409436]
[0.64218207]
[0.63113946]
[0.60231938]
[0.62332371]
[0.61823991]
[0.63785451]
[0.68554087]
[0.62625759]]
```

In [37]:

```
[[[0.78163418]
  [0.75066022]
  [0.73888117]
  [0.7738699 ]
  [0.76980366]
  [0.71933388]
  [0.70409436]
  [0.64218207]
  [0.63113946]
  [0.60231938]
  [0.62332371]
  [0.61823991]
  [0.63785451]
  [0.68554087]
  [0.62625759]]]
```

In [38]:

```
[0.781634180237323, 0.7506602208522886, 0.7388811681652789, 0.773869903827499
2, 0.7698036560595802, 0.7193338797230042, 0.7040943591205502, 0.642182074459
4502, 0.6311394600244686, 0.6023193845593446, 0.6233237121239117, 0.618239912
5776528, 0.6378545098924246, 0.6855408663839695, 0.6262575870957015]
```

In [39]:
```
lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[39], line 26
     23 else:
     25     x_input = x_input.reshape((1, n_steps,1))
---> 26     yhat = model.predict(x_input, verbose=0)
     27     temp_input.extend(yhat[0].tolist())
     29     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb

File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(self), ag__.ld(iterator)), None, fscope)
```

```
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [40]:
```
model.predict(x_input, verbose=0)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[40], line 1
----> 1 model.predict(x_input, verbose=0)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb

File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(self), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [41]:
```
look_back = time_step
train_predict_plot = np.empty_like(open_stock)
train_predict_plot[:, :] = np.nan
train_predict_plot[look_back : len(train_predict) + look_back, :] = train_pred
print("Train predicted data: ", train_predict_plot.shape)

# shift test predictions for plotting
test_predict_plot = np.empty_like(open_stock)
test_predict_plot[:, :] = np.nan
test_predict_plot[len(train_predict) + (look_back * 2) + 1:len(open_stock) - 1
print("Test predicted data: ", test_predict_plot.shape)

names = cycle(['Original Open price','Train predicted Open price','Test predic

plotdf = pd.DataFrame({'Date': open_eth['Date'],
                       'original_open': open_eth['Open'],
                      'train_predicted_open': train_predict_plot.reshape(1,-1)
                      'test_predicted_open': test_predict_plot.reshape(1,-1)[0
plotdf['original_open'] = plotdf['original_open'].astype(np.float64)

fig = px.line(plotdf, x = plotdf['Date'], y = [plotdf['original_open'], plotdf
              labels = {'value':'Ethereum price','Date': 'Date'})
fig.update_layout(title_text = 'Comparision between original Open price vs pre
                  plot_bgcolor = 'white', font_size = 15, font_color = 'black'
fig.for_each_trace(lambda t:  t.update(name = next(names)))

fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)
fig.show()
```

```
Train predicted data:  (365, 1)
Test predicted data:  (365, 1)
```

In [42]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[42], line 32
     29 else:
     31     x_input = x_input.reshape((1, n_steps,1))
---> 32     yhat = model.predict(x_input, verbose=0)
     33     temp_input.extend(yhat[0].tolist())
     35     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [43]:

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 gru (GRU)                   (None, 15, 32)            3360

 gru_1 (GRU)                 (None, 15, 32)            6336

 gru_2 (GRU)                 (None, 32)                6336

 dropout (Dropout)           (None, 32)                0

 dense (Dense)               (None, 1)                 33

=================================================================
Total params: 16,065
Trainable params: 16,065
Non-trainable params: 0
_________________________________________________________________
```

In [44]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[44], line 32
     29 else:
     31     x_input = x_input.reshape((1, n_steps,1))
---> 32     yhat = model.predict(x_input, verbose=0)
     33     temp_input.extend(yhat[0].tolist())
     35     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [45]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
```

In [46]:
```
```

In [47]:
```
lst_output=[]
n_steps=time_step
i=0
```

In [48]:
```
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))


        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))

        i=i+1
```

```
Output of predicted next days:  0
```

In [49]:
```
yhat = model.predict(x_input, verbose=0)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[49], line 1
----> 1 yhat = model.predict(x_input, verbose=0)
      2 print("{} day output {}".format(i,yhat))

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb

File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(self), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [50]:

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[50], line 1
----> 1 yhat = model.predict(x_input, verbose=0)

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb

File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(self), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [51]:

```
[[[0.78163418]
  [0.75066022]
  [0.73888117]
  [0.7738699 ]
  [0.76980366]
  [0.71933388]
  [0.70409436]
  [0.64218207]
  [0.63113946]
  [0.60231938]
  [0.62332371]
  [0.61823991]
  [0.63785451]
  [0.68554087]
  [0.62625759]]]
```

In [52]:

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[52], line 1
----> 1 print(modal)

NameError: name 'modal' is not defined
```

In [53]:

```
<keras.engine.sequential.Sequential object at 0x7f577f77fbb0>
```

In [54]:

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[54], line 1
----> 1 model.history()

TypeError: 'History' object is not callable
```

In [55]:

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[55], line 1
----> 1 model.sammary()

AttributeError: 'Sequential' object has no attribute 'sammary'
```

In [56]:

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 gru (GRU)                   (None, 15, 32)            3360

 gru_1 (GRU)                 (None, 15, 32)            6336

 gru_2 (GRU)                 (None, 32)                6336

 dropout (Dropout)           (None, 32)                0

 dense (Dense)               (None, 1)                 33

=================================================================
Total params: 16,065
Trainable params: 16,065
Non-trainable params: 0
_________________________________________________________________
```

In [57]:
```
lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(
    x_input, batch_size=None, verbose=0, steps=None, callbacks=None
)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(
    x_input, batch_size=None, verbose=0, steps=None, callbacks=None
)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[57], line 28
     25     else:
     27         x_input = x_input.reshape((1, n_steps,1))
---> 28         yhat = model.predict(
     29     x_input, batch_size=None, verbose=0, steps=None, callbacks=None
     30 )
     31         temp_input.extend(yhat[0].tolist())
     33         lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceb
ack_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [58]:
```
future = prophet.make_future_dataframe(periods=365, include_history=False)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[58], line 1
----> 1 future = prophet.make_future_dataframe(periods=365, include_history=F
alse)
      3 future.tail()

NameError: name 'prophet' is not defined
```

In [59]:

In [60]:
```
tf.keras.backend.clear_session()
model = Sequential()
model.add(GRU(32, return_sequences = True, input_shape = (time_step, 1)))
model.add(GRU(32, return_sequences = True))
model.add(GRU(32))
model.add(Dropout(0.20))
model.add(Dense(1))
```

```
2023-06-03 17:21:01.386848: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 17:21:01.389072: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 17:21:01.390685: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 17:21:01.625221: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 17:21:01.627358: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 17:21:01.628837: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 17:21:01.867184: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 17:21:01.869370: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
```

```
2023-06-03 17:21:01.871027: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
```

In [61]:

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 gru (GRU)                   (None, 15, 32)            3360

 gru_1 (GRU)                 (None, 15, 32)            6336

 gru_2 (GRU)                 (None, 32)                6336

 dropout (Dropout)           (None, 32)                0

 dense (Dense)               (None, 1)                 33

=================================================================
Total params: 16,065
Trainable params: 16,065
Non-trainable params: 0
_________________________________________________________________
```

In [62]:

```
history = model.fit(x_train_lstm, y_train, validation_data = (x_test_lstm, y_t
```

```
Epoch 1/200

2023-06-03 17:21:25.877524: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 17:21:25.879988: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 17:21:25.881751: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
```

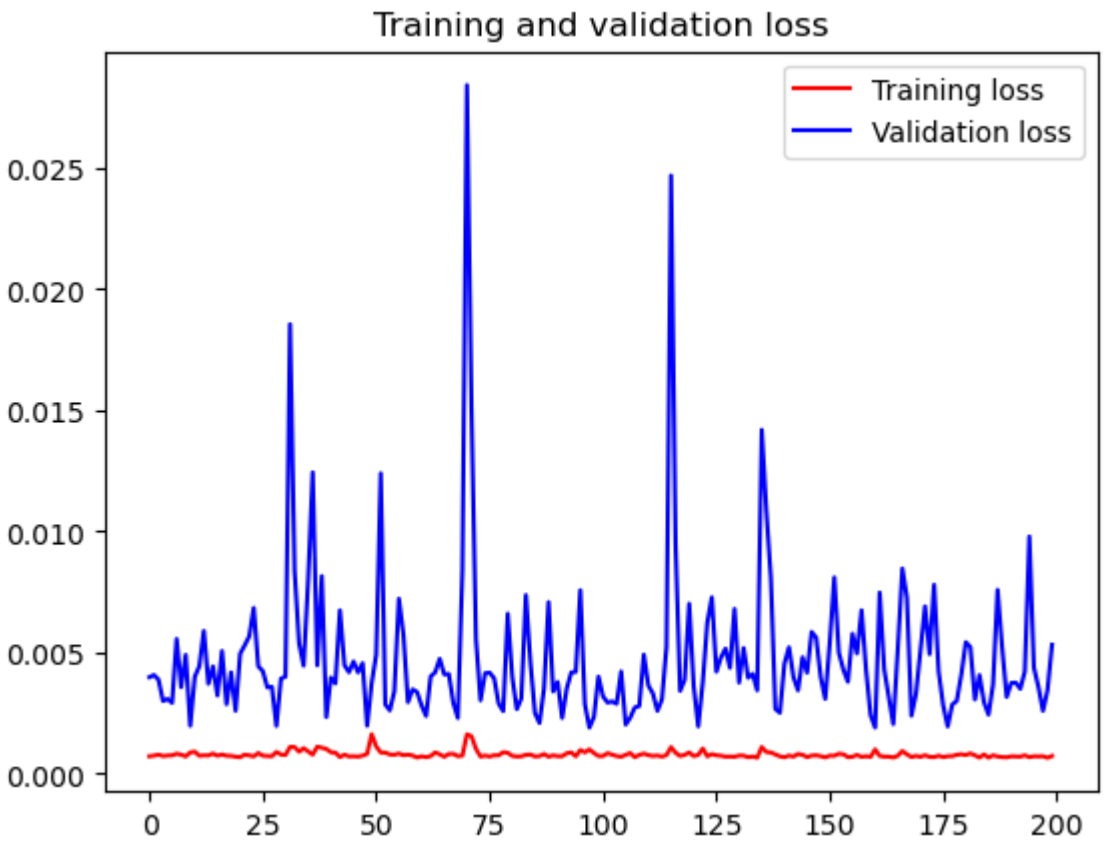
In [63]:
```
history = model.fit(x_train_lstm, y_train, validation_data = (x_test_lstm, y_t
```

```
Epoch 1/200
9/9 [==============================] - 0s 27ms/step - loss: 7.2342e-04 - val_
loss: 0.0040
Epoch 2/200
9/9 [==============================] - 0s 23ms/step - loss: 7.4844e-04 - val_
loss: 0.0041
Epoch 3/200
9/9 [==============================] - 0s 22ms/step - loss: 7.9047e-04 - val_
loss: 0.0039
Epoch 4/200
9/9 [==============================] - 0s 22ms/step - loss: 7.3296e-04 - val_
loss: 0.0030
Epoch 5/200
9/9 [==============================] - 0s 22ms/step - loss: 7.5275e-04 - val_
loss: 0.0031
Epoch 6/200
9/9 [==============================] - 0s 22ms/step - loss: 7.6324e-04 - val_
loss: 0.0029
Epoch 7/200
```

In [64]:
```
loss = history.history['loss']
val_loss = history.history['val_loss']

epochs = range(len(loss))

plt.plot(epochs, loss, 'r', label='Training loss')
plt.plot(epochs, val_loss, 'b', label='Validation loss')
plt.title('Training and validation loss')
plt.legend(loc=0)
plt.figure()
```




```
<Figure size 640x480 with 0 Axes>
```

In [65]:
```
train_predict = model.predict(x_train)
test_predict = model.predict(x_test)
```

```
2023-06-03 17:24:22.107530: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 17:24:22.109781: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 17:24:22.111269: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 17:24:22.331704: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 17:24:22.334299: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 17:24:22.335961: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]
2023-06-03 17:24:22.557612: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_2_grad/concat/split_2/split_d
im' with dtype int32
         [[{{node gradients/split_2_grad/concat/split_2/split_dim}}]]
2023-06-03 17:24:22.559700: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_grad/concat/split/split_dim'
with dtype int32
         [[{{node gradients/split_grad/concat/split/split_dim}}]]
2023-06-03 17:24:22.561213: I tensorflow/core/common_runtime/executor.cc:119
7] [/device:CPU:0] (DEBUG INFO) Executor start aborting (this does not indica
te an error and you can ignore this message): INVALID_ARGUMENT: You must feed
a value for placeholder tensor 'gradients/split_1_grad/concat/split_1/split_d
im' with dtype int32
```

```
         [[{{node gradients/split_1_grad/concat/split_1/split_dim}}]]

9/9 [==============================] - 1s 5ms/step
3/3 [==============================] - 0s 5ms/step
(257, 1) (76, 1)
```

In [66]:
```
train_predict = scaler.inverse_transform(train_predict)
test_predict = scaler.inverse_transform(test_predict)
original_ytrain = scaler.inverse_transform(y_train.reshape(-1,1))
```

In [67]:
```
print("Train data RMSE: ", math.sqrt(mean_squared_error(original_ytrain,train_
print("Train data MSE: ", mean_squared_error(original_ytrain,train_predict))
print("Train data MAE: ", mean_absolute_error(original_ytrain,train_predict))
print("-------------------------------------------------------------------------
print("Test data RMSE: ", math.sqrt(mean_squared_error(original_ytest,test_pre
print("Test data MSE: ", mean_squared_error(original_ytest,test_predict))
```

```
Train data RMSE:  64.2998602703385
Train data MSE:  4134.472030785056
Train data MAE:  46.47812410703429
-------------------------------------------------------------------------------
--------
Test data RMSE:  184.37567006988388
Test data MSE:  33994.38771371867
Test data MAE:  156.5134168122944
```

In [68]:
```
print("Train data explained variance regression score:", explained_variance_sc
```

```
Train data explained variance regression score: 0.9133070681494326
Test data explained variance regression score: 0.9370611196628414
```

In [69]:
```
print("Train data R2 score:", r2_score(original_ytrain, train_predict))
```

```
Train data R2 score: 0.9102876829819413
Test data R2 score: 0.8250294274812917
```

In [70]:
```
print("Train data MGD: ", mean_gamma_deviance(original_ytrain, train_predict))
print("Test data MGD: ", mean_gamma_deviance(original_ytest, test_predict))
print("----------------------------------------------------------------------"
print("Train data MPD: ", mean_poisson_deviance(original_ytrain, train_predict
```

```
Train data MGD:  0.0021327907666543484
Test data MGD:  0.004489072447865193
-------------------------------------------------------------------------
Train data MPD:  2.940411742038013
Test data MPD:  12.224389597061167
```

In [71]:
```
look_back = time_step
train_predict_plot = np.empty_like(open_stock)
train_predict_plot[:, :] = np.nan
train_predict_plot[look_back : len(train_predict) + look_back, :] = train_pred
print("Train predicted data: ", train_predict_plot.shape)

# shift test predictions for plotting
test_predict_plot = np.empty_like(open_stock)
test_predict_plot[:, :] = np.nan
test_predict_plot[len(train_predict) + (look_back * 2) + 1:len(open_stock) - 1
print("Test predicted data: ", test_predict_plot.shape)

names = cycle(['Original Open price','Train predicted Open price','Test predic

plotdf = pd.DataFrame({'Date': open_eth['Date'],
                       'original_open': open_eth['Open'],
                      'train_predicted_open': train_predict_plot.reshape(1,-1)
                      'test_predicted_open': test_predict_plot.reshape(1,-1)[0
plotdf['original_open'] = plotdf['original_open'].astype(np.float64)

fig = px.line(plotdf, x = plotdf['Date'], y = [plotdf['original_open'], plotdf
              labels = {'value':'Ethereum price','Date': 'Date'})
fig.update_layout(title_text = 'Comparision between original Open price vs pre
                  plot_bgcolor = 'white', font_size = 15, font_color = 'black'
fig.for_each_trace(lambda t:  t.update(name = next(names)))

fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)
fig.show()
```

```
Train predicted data:  (365, 1)
Test predicted data:  (365, 1)
```

In [72]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[72], line 32
     29 else:
     31     x_input = x_input.reshape((1, n_steps,1))
---> 32     yhat = model.predict(x_input, verbose=0)
     33     temp_input.extend(yhat[0].tolist())
     35     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [73]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = self.model.predic(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        #x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[73], line 20
     17 x_input = x_input.reshape(1,-1)
     18 x_input = x_input.reshape((1, n_steps, 1))
---> 20 yhat = self.model.predic(x_input, verbose=0)
     21 #print("{} day output {}".format(i,yhat))
     22 temp_input.extend(yhat[0].tolist())

NameError: name 'self' is not defined
```

In [74]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predic(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        #x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[74], line 20
     17 x_input = x_input.reshape(1,-1)
     18 x_input = x_input.reshape((1, n_steps, 1))
---> 20 yhat = model.predic(x_input, verbose=0)
     21 #print("{} day output {}".format(i,yhat))
     22 temp_input.extend(yhat[0].tolist())

AttributeError: 'Sequential' object has no attribute 'predic'
```

In [75]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        #x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[75], line 20
     17 x_input = x_input.reshape(1,-1)
     18 x_input = x_input.reshape((1, n_steps, 1))
---> 20 yhat = model.predict(x_input, verbose=0)
     21 #print("{} day output {}".format(i,yhat))
     22 temp_input.extend(yhat[0].tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [76]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[76], line 32
     29 else:
     31     x_input = x_input.reshape((1, n_steps,1))
---> 32     yhat = model.predict(x_input, verbose=0)
     33     temp_input.extend(yhat[0].tolist())
     35     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [77]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0,batch_size=50)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0,batch_size=50)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[77], line 32
     29 else:
     31     x_input = x_input.reshape((1, n_steps,1))
---> 32     yhat = model.predict(x_input, verbose=0,batch_size=50)
     33     temp_input.extend(yhat[0].tolist())
     35     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [78]:
```
timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).
```

```
  Cell In[78], line 3
    TypeError: Exception encountered when calling layer 'gru' (type GRU).
    ^
IndentationError: unexpected indent
```

In [79]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))
        model.build(x_input)
        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
         model.build(x_input)
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1

print("Output of predicted next days: ", len(lst_output))
```

```
  Cell In[79], line 32
    model.build(x_input)
    ^
TabError: inconsistent use of tabs and spaces in indentation
```

In [80]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))
        model.build(x_input)
        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        model.build(x_input)
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1

print("Output of predicted next days: ", len(lst_output))
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[80], line 33
     31 x_input = x_input.reshape((1, n_steps,1))
     32 model.build(x_input)
---> 33 yhat = model.predict(x_input, verbose=0)
     34 temp_input.extend(yhat[0].tolist())
     36 lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
```

```
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb

File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [81]:

```
[<keras.layers.rnn.gru.GRU object at 0x7f5794792cb0>, <keras.layers.rnn.gru.G
RU object at 0x7f579452aa40>, <keras.layers.rnn.gru.GRU object at 0x7f579453e
fb0>, <keras.layers.regularization.dropout.Dropout object at 0x7f579477ce80>,
<keras.layers.core.dense.Dense object at 0x7f579451ecb0>]
```

In [82]:

Out[82]: <keras.engine.sequential.Sequential at 0x7f579478cb20>

In [83]:

```
[<tf.Variable 'gru/gru_cell/kernel:0' shape=(1, 96) dtype=float32, numpy=
array([[-0.4675926 , -0.4583032 , -0.25627294, -0.3096898 ,  0.20451488,
        -0.47829944,  0.0616861 , -0.42456788, -0.6167897 , -0.17005396,
        -0.4510893 , -0.15433194, -0.06750139, -0.3424255 , -0.23413847,
        -0.35147852,  0.04165895, -0.2447185 , -0.5362056 , -0.51883376,
        -0.6197489 , -0.400202  , -0.41395116, -0.59627974, -0.23721513,
        -0.45524716, -0.45204568, -0.5542112 , -0.22785133,  0.19850314,
        -0.47654143, -0.36930192,  0.03876658,  0.03281736,  0.10187196,
         0.20694722, -0.2743962 ,  0.12162845, -0.23476878,  0.03923442,
        -0.01755475, -0.11254548, -0.23940405,  0.03760898, -0.10037964,
         0.1212007 ,  0.05669703, -0.23065478, -0.22075243,  0.05051727,
         0.16658296, -0.08814889,  0.15295053,  0.05661321, -0.34609872,
        -0.02257458, -0.00693764, -0.23127003, -0.20463733, -0.09175356,
        -0.04070605, -0.04293722, -0.04191661, -0.18263322,  0.24607678,
        -0.01278828, -0.13701041,  0.01130888, -0.04342505, -0.26830912,
         0.04560719, -0.07583407,  0.22444993, -0.18768613,  0.04518004,
        -0.08231259,  0.10357872,  0.23993093, -0.2526148 ,  0.24425156,
        -0.11154495, -0.12993479, -0.18308358, -0.24848574,  0.25509837,
        -0.18765205,  0.2559934 ,  0.21718024,  0.05008892,  0.27908367,
```

In [84]:

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[84], line 1
----> 1 model.preduct(input_data)

AttributeError: 'Sequential' object has no attribute 'preduct'
```

In [85]:

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[85], line 1
----> 1 model.predict(input_data)

NameError: name 'input_data' is not defined
```

In [86]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))
        model.build(x_input)
        yhat = model.predict(x_input)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        model.build(x_input)
        yhat = model.predict(x_input)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[86], line 33
     31 x_input = x_input.reshape((1, n_steps,1))
     32 model.build(x_input)
---> 33 yhat = model.predict(x_input)
     34 temp_input.extend(yhat[0].tolist())
     36 lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [ ]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))
        model.build(x_input)

        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        model.build(x_input)
        #yhat = model.predict(x_input, verbose=0)


print("Output of predicted next days: ", len(lst_output))
```

```
---------------------------------------------------------------------------
KeyboardInterrupt                         Traceback (most recent call last)
Cell In[87], line 26
     23     else:
     25         x_input = x_input.reshape((1, n_steps,1))
---> 26         model.build(x_input)
     27         #yhat = model.predict(x_input, verbose=0)
     30 print("Output of predicted next days: ", len(lst_output))

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/sequential.py:375, in Sequential.build(self, input_shape)
    372 @generic_utils.default
    373 def build(self, input_shape=None):
    374     if self._graph_initialized:
--> 375         self._init_graph_network(self.inputs, self.outputs)
    376     else:
    377         if input_shape is None:

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/tensorflow/python/trackable/base.py:205, in no_automatic_dependency_tracking.<locals>._method_wrapper(self, *args, **kwargs)
    203 self._self_setattr_tracking = False  # pylint: disable=protected-access
```

```
    204 try:
--> 205   result = method(self, *args, **kwargs)
    206 finally:
    207   self._self_setattr_tracking = previous_value  # pylint: disable=pro
tected-access

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/engine/funct
ional.py:174, in Functional._init_graph_network(self, inputs, outputs)
    169 @tf.__internal__.tracking.no_automatic_dependency_tracking
    170 def _init_graph_network(self, inputs, outputs):
    171     # This method is needed for Sequential to reinitialize graph netw
ork
    172     # when layer is added or removed.
--> 174     base_layer.keras_api_gauge.get_cell("Functional").set(True)
    175     self._is_graph_network = True
    177     # Normalize and set self.inputs, self.outputs.

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/tensorflow/python/
eager/monitoring.py:361, in BoolGauge.get_cell(self, *labels)
    359 def get_cell(self, *labels):
    360   """Retrieves the cell."""
--> 361   return BoolGaugeCell(super(BoolGauge, self).get_cell(*labels))

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/tensorflow/python/
eager/monitoring.py:143, in Metric.get_cell(self, *labels)
    140   if deleter is not None:
    141     deleter(metric)
--> 143 def get_cell(self, *labels):
    144   """Retrieves the cell."""
    145   if len(labels) != self._label_length:

KeyboardInterrupt:
```

In [ ]:
```
# x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))
        model.build(x_input)

        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        model.build(x_input)
```

In [ ]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = self.model.predic(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

In [ ]:

In [88]:

Output of predicted next days:

In [89]:

In [90]:

In [91]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[91], line 32
     29 else:
     31     x_input = x_input.reshape((1, n_steps,1))
---> 32     yhat = model.predict(x_input, verbose=0)
     33     temp_input.extend(yhat[0].tolist())
     35     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [92]:
```
look_back = time_step
train_predict_plot = np.empty_like(open_stock)
train_predict_plot[:, :] = np.nan
train_predict_plot[look_back : len(train_predict) + look_back, :] = train_pred
print("Train predicted data: ", train_predict_plot.shape)

# shift test predictions for plotting
test_predict_plot = np.empty_like(open_stock)
test_predict_plot[:, :] = np.nan
test_predict_plot[len(train_predict) + (look_back * 2) + 1:len(open_stock) - 1
print("Test predicted data: ", test_predict_plot.shape)

names = cycle(['Original Open price','Train predicted Open price','Test predic

plotdf = pd.DataFrame({'Date': open_eth['Date'],
                       'original_open': open_eth['Open'],
                      'train_predicted_open': train_predict_plot.reshape(1,-1)
                      'test_predicted_open': test_predict_plot.reshape(1,-1)[0
plotdf['original_open'] = plotdf['original_open'].astype(np.float64)

fig = px.line(plotdf, x = plotdf['Date'], y = [plotdf['original_open'], plotdf
              labels = {'value':'Ethereum price','Date': 'Date'})
fig.update_layout(title_text = 'Comparision between original Open price vs pre
                  plot_bgcolor = 'white', font_size = 15, font_color = 'black'
fig.for_each_trace(lambda t:  t.update(name = next(names)))

fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)
fig.show()
```

```
Train predicted data:  (365, 1)
Test predicted data:  (365, 1)
```

In [93]:
```
last_days=np.arange(1,time_step+1)
day_pred=np.arange(time_step+1,time_step+pred_days+1)
print(last_days)
```

```
[ 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15]
[16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
 40 41 42 43 44 45]
```

In [94]:
```
temp_mat = np.empty((len(last_days)+pred_days+1,1))
temp_mat[:] = np.nan
temp_mat = temp_mat.reshape(1,-1).tolist()[0]

last_original_days_value = temp_mat
next_predicted_days_value = temp_mat

last_original_days_value[0:time_step+1] = scaler.inverse_transform(open_stock[
next_predicted_days_value[time_step+1:] = scaler.inverse_transform(np.array(ls

new_pred_plot = pd.DataFrame({
    'last_original_days_value':last_original_days_value,
    'next_predicted_days_value':next_predicted_days_value
})

names = cycle(['Last 15 days Open price','Predicted next 30 days Open price'])

fig = px.line(new_pred_plot,x=new_pred_plot.index, y=[new_pred_plot['last_orig
                                                      new_pred_plot['next_pred
              labels={'value': 'Ethereum price','index': 'Timestamp'})
fig.update_layout(title_text='Comparing last 15 days vs next 30 days',
                  plot_bgcolor='white', font_size=15, font_color='black',legen

fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)
fig.show()
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
Cell In[94], line 9
      6 next_predicted_days_value = temp_mat
      8 last_original_days_value[0:time_step+1] = scaler.inverse_transform(op
en_stock[len(open_stock)-time_step:]).reshape(1,-1).tolist()[0]
----> 9 next_predicted_days_value[time_step+1:] = scaler.inverse_transform(n
p.array(lst_output).reshape(-1,1)).reshape(1,-1).tolist()[0]
     11 new_pred_plot = pd.DataFrame({
     12     'last_original_days_value':last_original_days_value,
     13     'next_predicted_days_value':next_predicted_days_value
     14 })
     16 names = cycle(['Last 15 days Open price','Predicted next 30 days Open
price'])

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/preprocess
ing/_data.py:537, in MinMaxScaler.inverse_transform(self, X)
    523 """Undo the scaling of X according to feature_range.
    524
    525 Parameters
   (...)
    533     Transformed data.
    534 """
    535 check_is_fitted(self)
--> 537 X = check_array(
    538     X, copy=self.copy, dtype=FLOAT_DTYPES, force_all_finite="allow-na
n"
    539 )
```

```
    541 X -= self.min_
    542 X /= self.scale_

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/utils/validation.py:931, in check_array(array, accept_sparse, accept_large_sparse, dtype, order, copy, force_all_finite, ensure_2d, allow_nd, ensure_min_samples, ensure_min_features, estimator, input_name)
    929     n_samples = _num_samples(array)
    930     if n_samples < ensure_min_samples:
--> 931         raise ValueError(
    932             "Found array with %d sample(s) (shape=%s) while a"
    933             " minimum of %d is required%s."
    934             % (n_samples, array.shape, ensure_min_samples, context)
    935         )
    937 if ensure_min_features > 0 and array.ndim == 2:
    938     n_features = array.shape[1]

ValueError: Found array with 0 sample(s) (shape=(0, 1)) while a minimum of 1 is required.
```

In [95]:

```
temp_mat = np.empty((len(last_days)+pred_days+1,1))
temp_mat[:] = np.nan
temp_mat = temp_mat.reshape(1,-1).tolist()[0]
•
last_original_days_value = temp_mat
next_predicted_days_value = temp_mat
•
last_original_days_value[0:time_step+1] = scaler.inverse_transform(open_stock[
next_predicted_days_value[time_step+1:] = scaler.inverse_transform(np.array(ls
•
new_pred_plot = pd.DataFrame({
    'last_original_days_value':last_original_days_value,
    'next_predicted_days_value':next_predicted_days_value
})
•
names = cycle(['Last 15 days Open price','Predicted next 30 days Open price'])
•
fig = px.line(new_pred_plot,x=new_pred_plot.index, y=[new_pred_plot['last_orig
                                                      new_pred_plot['next_pred
              labels={'value': 'Ethereum price','index': 'Timestamp'})
fig.update_layout(title_text='Comparing last 15 days vs next 30 days',
                  plot_bgcolor='white', font_size=15, font_color='black',legen
•
fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)
fig.show()
```

```
  Cell In[95], line 4

    ^
SyntaxError: invalid non-printable character U+200B
```

In [96]:
```
temp_mat = np.empty((len(last_days)+pred_days+1,1))
temp_mat[:] = np.nan
temp_mat = temp_mat.reshape(1,-1).tolist()[0]

last_original_days_value = temp_mat
next_predicted_days_value = temp_mat

last_original_days_value[0:time_step+1] = scaler.inverse_transform(open_stock[
next_predicted_days_value[time_step+1:] = scaler.inverse_transform(np.array(ls

new_pred_plot = pd.DataFrame({
    'last_original_days_value':last_original_days_value,
    'next_predicted_days_value':next_predicted_days_value
})

names = cycle(['Last 15 days Open price','Predicted next 30 days Open price'])

fig = px.line(new_pred_plot,x=new_pred_plot.index, y=[new_pred_plot['last_orig
                                                      new_pred_plot['next_pred
              labels={'value': 'Ethereum price','index': 'Timestamp'})
fig.update_layout(title_text='Comparing last 15 days vs next 30 days',
                  plot_bgcolor='white', font_size=15, font_color='black',legen

fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)
fig.show()
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
Cell In[96], line 9
      6 next_predicted_days_value = temp_mat
      8 last_original_days_value[0:time_step+1] = scaler.inverse_transform(op
en_stock[len(open_stock)-time_step:]).reshape(1,-1).tolist()[0]
----> 9 next_predicted_days_value[time_step+1:] = scaler.inverse_transform(n
p.array(lst_output).reshape(-1,1)).reshape(1,-1).tolist()[0]
     11 new_pred_plot = pd.DataFrame({
     12     'last_original_days_value':last_original_days_value,
     13     'next_predicted_days_value':next_predicted_days_value
     14 })
     16 names = cycle(['Last 15 days Open price','Predicted next 30 days Open
price'])

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/preprocess
ing/_data.py:537, in MinMaxScaler.inverse_transform(self, X)
    523 """Undo the scaling of X according to feature_range.
    524
    525 Parameters
   (...)
    533     Transformed data.
    534 """
    535 check_is_fitted(self)
--> 537 X = check_array(
    538     X, copy=self.copy, dtype=FLOAT_DTYPES, force_all_finite="allow-na
n"
    539 )
```

```
    541 X -= self.min_
    542 X /= self.scale_

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/utils/validation.py:931, in check_array(array, accept_sparse, accept_large_sparse, dtype, order, copy, force_all_finite, ensure_2d, allow_nd, ensure_min_samples, ensure_min_features, estimator, input_name)
    929     n_samples = _num_samples(array)
    930     if n_samples < ensure_min_samples:
--> 931         raise ValueError(
    932             "Found array with %d sample(s) (shape=%s) while a"
    933             " minimum of %d is required%s."
    934             % (n_samples, array.shape, ensure_min_samples, context)
    935         )
    937 if ensure_min_features > 0 and array.ndim == 2:
    938     n_features = array.shape[1]

ValueError: Found array with 0 sample(s) (shape=(0, 1)) while a minimum of 1 is required.
```

In [97]:
```
lstmdf=open_stock.tolist()
lstmdf.extend((np.array(lst_output).reshape(-1,1)).tolist())
lstmdf=scaler.inverse_transform(lstmdf).reshape(1,-1).tolist()[0]

names = cycle(['Close price'])

fig = px.line(lstmdf,labels={'value': 'Stock price','index': 'Timestamp'})
fig.update_layout(title_text='Plotting whole closing stock price with predicti
                  plot_bgcolor='white', font_size=15, font_color='black',legen

fig.for_each_trace(lambda t:  t.update(name = next(names)))

fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)
```

In [98]:
```
last_days=np.arange(1,time_step+1)
day_pred=np.arange(time_step+1,time_step+pred_days+1)
print(last_days)
```

```
[ 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15]
[16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
 40 41 42 43 44 45]
```

In [99]:
```
temp_mat = np.empty((len(last_days)+pred_days+1,1))
temp_mat[:] = np.nan
temp_mat = temp_mat.reshape(1,-1).tolist()[0]

last_original_days_value = temp_mat
next_predicted_days_value = temp_mat

last_original_days_value[0:time_step+1] = scaler.inverse_transform(open_stock[
next_predicted_days_value[time_step+1:] = scaler.inverse_transform(np.array(ls

new_pred_plot = pd.DataFrame({
    'last_original_days_value':last_original_days_value,
    'next_predicted_days_value':next_predicted_days_value
})

names = cycle(['Last 15 days Open price','Predicted next 30 days Open price'])

fig = px.line(new_pred_plot,x=new_pred_plot.index, y=[new_pred_plot['last_orig
                                                      new_pred_plot['next_pred
              labels={'value': 'Ethereum price','index': 'Timestamp'})
fig.update_layout(title_text='Comparing last 15 days vs next 30 days',
                  plot_bgcolor='white', font_size=15, font_color='black',legen

fig.for_each_trace(lambda t:  t.update(name = next(names)))
fig.update_xaxes(showgrid=False)
fig.update_yaxes(showgrid=False)
fig.show()
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
Cell In[99], line 9
      6 next_predicted_days_value = temp_mat
      8 last_original_days_value[0:time_step+1] = scaler.inverse_transform(op
en_stock[len(open_stock)-time_step:]).reshape(1,-1).tolist()[0]
----> 9 next_predicted_days_value[time_step+1:] = scaler.inverse_transform(n
p.array(lst_output).reshape(-1,1)).reshape(1,-1).tolist()[0]
     11 new_pred_plot = pd.DataFrame({
     12     'last_original_days_value':last_original_days_value,
     13     'next_predicted_days_value':next_predicted_days_value
     14 })
     16 names = cycle(['Last 15 days Open price','Predicted next 30 days Open
price'])

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/preprocess
ing/_data.py:537, in MinMaxScaler.inverse_transform(self, X)
    523 """Undo the scaling of X according to feature_range.
    524
    525 Parameters
   (...)
    533     Transformed data.
    534 """
    535 check_is_fitted(self)
--> 537 X = check_array(
    538     X, copy=self.copy, dtype=FLOAT_DTYPES, force_all_finite="allow-na
n"
    539 )
```

```
    541 X -= self.min_
    542 X /= self.scale_

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/sklearn/utils/validation.py:931, in check_array(array, accept_sparse, accept_large_sparse, dtype, order, copy, force_all_finite, ensure_2d, allow_nd, ensure_min_samples, ensure_min_features, estimator, input_name)
    929     n_samples = _num_samples(array)
    930     if n_samples < ensure_min_samples:
--> 931         raise ValueError(
    932             "Found array with %d sample(s) (shape=%s) while a"
    933             " minimum of %d is required%s."
    934             % (n_samples, array.shape, ensure_min_samples, context)
    935         )
    937 if ensure_min_features > 0 and array.ndim == 2:
    938     n_features = array.shape[1]

ValueError: Found array with 0 sample(s) (shape=(0, 1)) while a minimum of 1 is required.
```

In [100]:
```
x_input=test_data[len(test_data)-time_step:].reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()

from numpy import array

lst_output=[]
n_steps=time_step
i=0
pred_days = 30
while(i<pred_days):

    if(len(temp_input)>time_step):

        x_input=np.array(temp_input[1:])
        #print("{} day input {}".format(i,x_input))
        x_input = x_input.reshape(1,-1)
        x_input = x_input.reshape((1, n_steps, 1))

        yhat = model.predict(x_input, verbose=0)
        #print("{} day output {}".format(i,yhat))
        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)

        lst_output.extend(yhat.tolist())
        i=i+1

    else:

        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        temp_input.extend(yhat[0].tolist())

        lst_output.extend(yhat.tolist())
        i=i+1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[100], line 32
     29 else:
     31     x_input = x_input.reshape((1, n_steps,1))
---> 32     yhat = model.predict(x_input, verbose=0)
     33     temp_input.extend(yhat[0].tolist())
     35     lst_output.extend(yhat.tolist())

File ~/anaconda3/envs/python3/lib/python3.10/site-packages/keras/utils/traceback_utils.py:70, in filter_traceback.<locals>.error_handler(*args, **kwargs)
     67     filtered_tb = _process_traceback_frames(e.__traceback__)
     68     # To get the full stack trace, call:
     69     # `tf.debugging.disable_traceback_filtering()`
---> 70     raise e.with_traceback(filtered_tb) from None
     71 finally:
     72     del filtered_tb
```

```
File /tmp/__autograph_generated_filemo_5b27w.py:15, in outer_factory.<locals
>.inner_factory.<locals>.tf__predict_function(iterator)
     13 try:
     14     do_return = True
---> 15     retval_ = ag__.converted_call(ag__.ld(step_function), (ag__.ld(se
lf), ag__.ld(iterator)), None, fscope)
     16 except:
     17     do_return = False

TypeError: in user code:

    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2169, in predict_function  *
        return step_function(self, iterator)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2155, in step_function  **
        outputs = model.distribute_strategy.run(run_step, args=(data,))
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2143, in run_step  **
        outputs = model.predict_step(data)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/engine/training.py", line 2111, in predict_step
        return self(x, training=False)
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/utils/traceback_utils.py", line 70, in error_handler
        raise e.with_traceback(filtered_tb) from None
    File "/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/
keras/layers/rnn/gru.py", line 642, in call
        timesteps = input_shape[0] if self.time_major else input_shape[1]

    TypeError: Exception encountered when calling layer 'gru' (type GRU).

    'NoneType' object is not subscriptable

    Call arguments received by layer 'gru' (type GRU):
      • inputs=tf.Tensor(shape=<unknown>, dtype=float32)
      • mask=None
      • training=False
      • initial_state=None
```

In [101]:

```
[[1652.5752]
 [1694.7445]
 [1674.2644]
 [1679.8536]
 [1681.4735]
 [1629.9391]
 [1660.1987]
 [1551.0345]
 [1496.6803]
 [1506.0012]
 [1535.2137]
 [1517.1669]
 [1546.0575]
 [1651.2509]
 [1675.9838]
 [1615.14  ]
 [1620.1312]
 [1657.1636]
 [1657.2373]
```

In [102]:
```
print(test_predict)
```

```
[[1966.5728]
 [1946.9183]
 [2008.4347]
 [1935.1473]
 [1913.4644]
 [1976.72  ]
 [1874.2042]
 [2054.7217]
 [1987.227 ]
 [2106.7515]
 [2009.8596]
 [1953.5481]
 [1900.5219]
 [2043.6547]
 [2328.8289]
 [2186.4058]
 [2482.6255]
 [2583.9385]
 [2608.4126]
 [2640.6658]
 [2845.0588]
 [2633.6172]
 [2712.2363]
 [2680.8425]
 [2573.8054]
 [2686.8342]
 [2823.8325]
 [2745.7312]
 [2647.629 ]
 [2883.2139]
 [2769.2734]
 [2771.7524]
 [2809.1082]
 [2830.137 ]
 [2929.1145]
 [2939.842 ]
 [2872.3877]
 [2799.188 ]
 [2893.88  ]
 [2873.204 ]
 [2846.7263]
 [2958.485 ]
 [2844.5112]
 [2791.8208]
 [3066.8293]
 [3099.477 ]
 [2987.9377]
 [3026.9329]
 [2961.4697]
 [3248.4407]
 [3334.867 ]
 [3282.3892]
 [3174.748 ]
 [3207.1743]
```

```
[3020.293 ]
[3170.689 ]
[3188.0066]
[3093.0964]
[3062.4685]
[2908.8542]
[2890.4048]
[2923.4182]
[2846.2747]
[2781.606 ]
[2710.7834]
[2696.7266]
[2811.4648]
[2792.3435]
[2642.764 ]
[2612.2908]
[2460.6443]
[2451.834 ]
[2392.7073]
[2464.6294]
[2454.4714]
[2506.9392]]
```

In [103]:

```
(257, 1) (76, 1)
```

In [104]:
```
train_predict = scaler.inverse_transform(train_predict)
test_predict = scaler.inverse_transform(test_predict)
original_ytrain = scaler.inverse_transform(y_train.reshape(-1,1))
```

In [105]:
```
print("Train data RMSE: ", math.sqrt(mean_squared_error(original_ytrain,train_
print("Train data MSE: ", mean_squared_error(original_ytrain,train_predict))
print("Train data MAE: ", mean_absolute_error(original_ytrain,train_predict))
print("-------------------------------------------------------------------------
print("Test data RMSE: ", math.sqrt(mean_squared_error(original_ytest,test_pre
print("Test data MSE: ", mean_squared_error(original_ytest,test_predict))
```

```
Train data RMSE:  3639035.488366595
Train data MSE:  13242579285591.502
Train data MAE:  3604896.6409727624
-------------------------------------------------------------------------------
--------
Test data RMSE:  6781757.410855182
Test data MSE:  45992233579689.19
Test data MAE:  6709288.928947368
```

In [106]:
```
print("Train data explained variance regression score:", explained_variance_sc
```

```
Train data explained variance regression score: -5366055.510629659
Test data explained variance regression score: -5032137.517617563
```

In [107]:
```
print("Train data R2 score:", r2_score(original_ytrain, train_predict))
```

```
Train data R2 score: -287345629.1457142
Test data R2 score: -236723999.10913685
```

In [108]:
```
print("Train data MGD: ", mean_gamma_deviance(original_ytrain, train_predict))
print("Test data MGD: ", mean_gamma_deviance(original_ytest, test_predict))
print("----------------------------------------------------------------------")
print("Train data MPD: ", mean_poisson_deviance(original_ytrain, train_predict
```

```
Train data MGD:  13.690426008568618
Test data MGD:  13.565087987921435
----------------------------------------------------------------------
Train data MPD:  7187590.339952098
Test data MPD:  13374938.976479327
```

In [ ]: