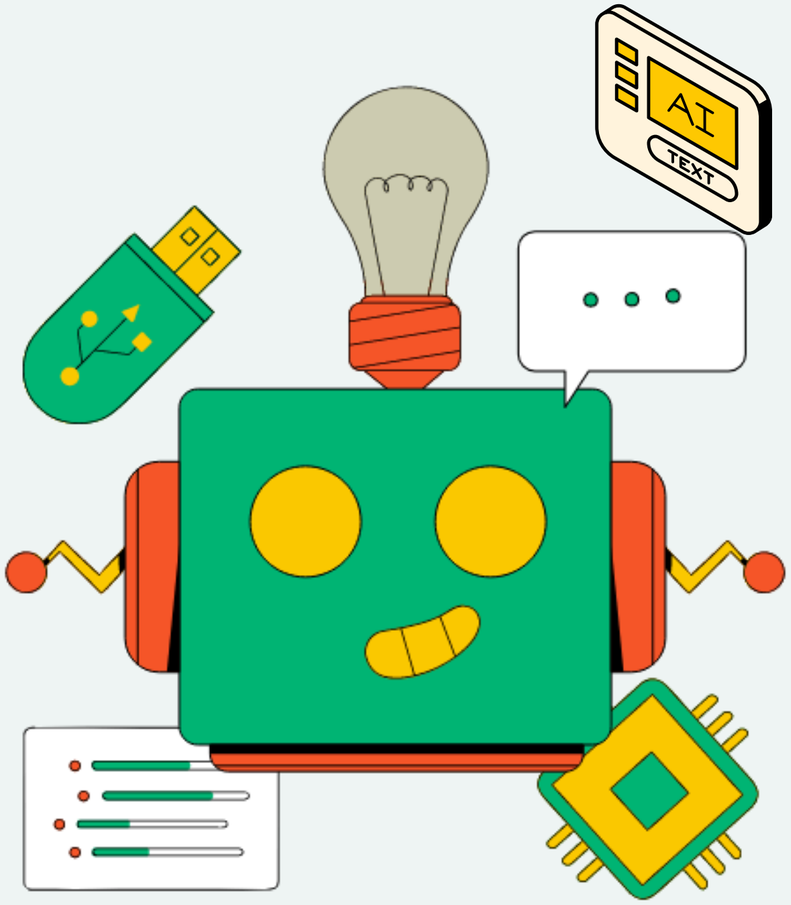

BITCOIN FORECAST: PREDICTING PRICE TRENDS

TEAM MEMBERS

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ML Developer

Ayush Prajapati
Data Analyst &
Documentation

OBJECTIVE

- The primary objective is to develop and validate a robust machine learning model capable of accurately forecasting future price trends of Bitcoin. This endeavor aims to leverage historical data encompassing Bitcoin prices, market sentiment, and relevant financial indicators to predict short-term and long-term price movements. The model will serve as a critical tool for investors, financial analysts, and cryptocurrency enthusiasts, providing them with actionable insights to make informed investment decisions.

DATASET

- Dataset consists of 26M records of bitcoin currency data.

Fields	Input
BTC-2017min.csv	1 minute historical data of year 2017
BTC-2018min.csv	1 minute historical data of year 2018
BTC-2019min.csv	1 minute historical data of year 2019
BTC-2020min.csv	1 minute historical data of year 2020
BTC-2021min.csv	1 minute historical data of year 2021

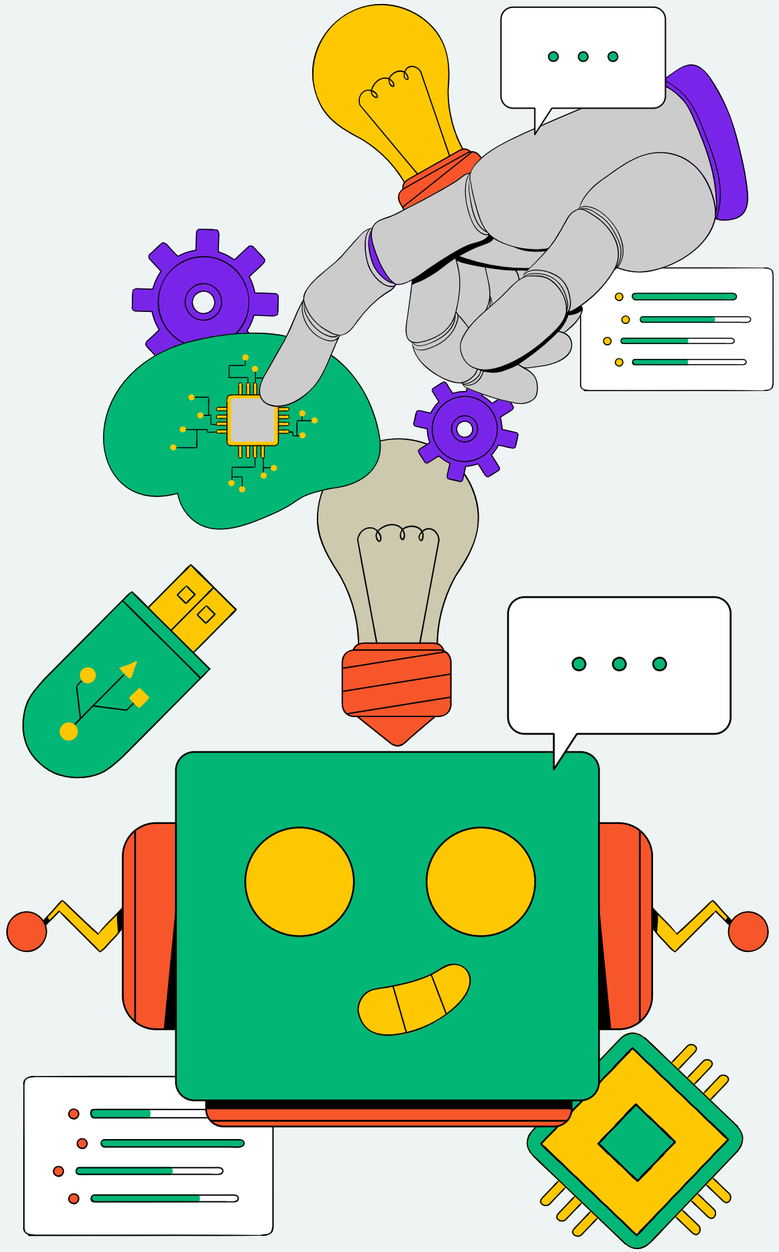
- Data Source: https://www.kaggle.com/datasets/prasoonkottarathil/btcinusd?select=BTC-2018min.csv

MODEL SELECTION AND TRAINING

Models

- LSTM (Long Short-Term Memory)
- GRU (Gated Recurrent Units)
- Bidirectional LSTM (Bi-LSTM)

- We've developed these models using features – index, values.
- 80% training data & 20% test data



MODELS

01

LSTM (LONG SHORT-TERM MEMORY)

Since LSTMs are built to retain long-term dependencies in time series data, they are particularly useful in financial markets where historical trends may have an impact on future prices.

02

GRU (GATED RECURRENT UNITS)

GRUs provide similar functionality as LSTMs but with fewer parameters. This makes them computationally more efficient and faster to train without a significant loss in performance, especially when multiple models or large datasets are involved in the forecasting.

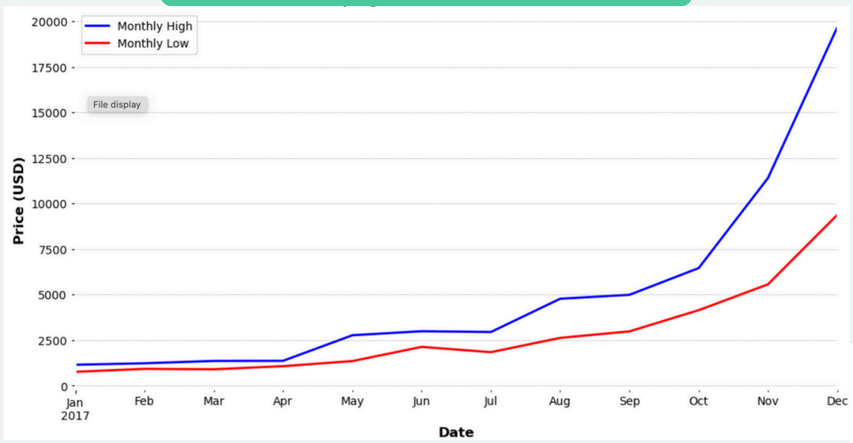
03

BIDIRECTIONAL LSTM (BI-LSTM)

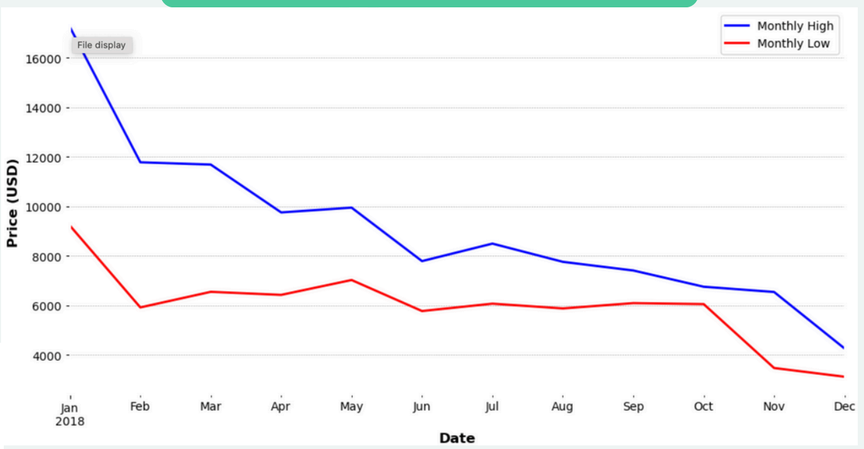
Bidirectional LSTMs run inputs in two ways, one from past to future and another from future to past, essentially providing the model with all available information in the data at every point in time.

Data Analysis and visualization

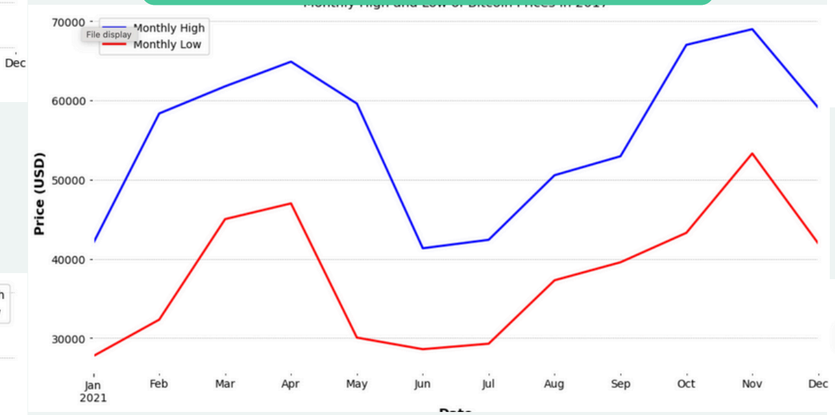
2017



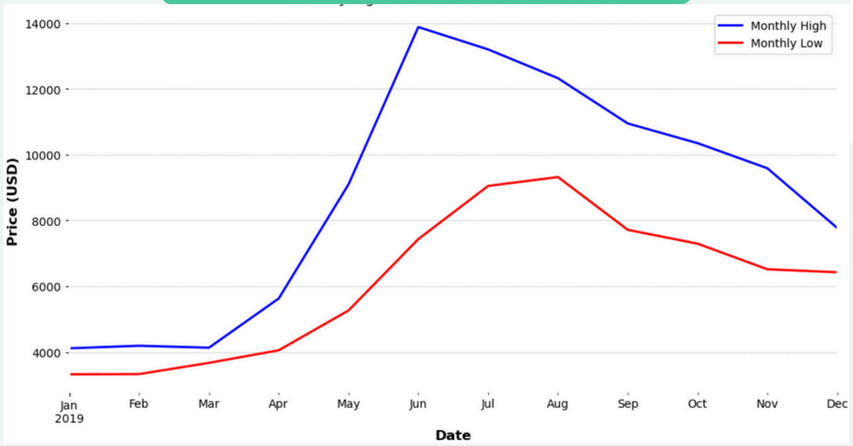
2018



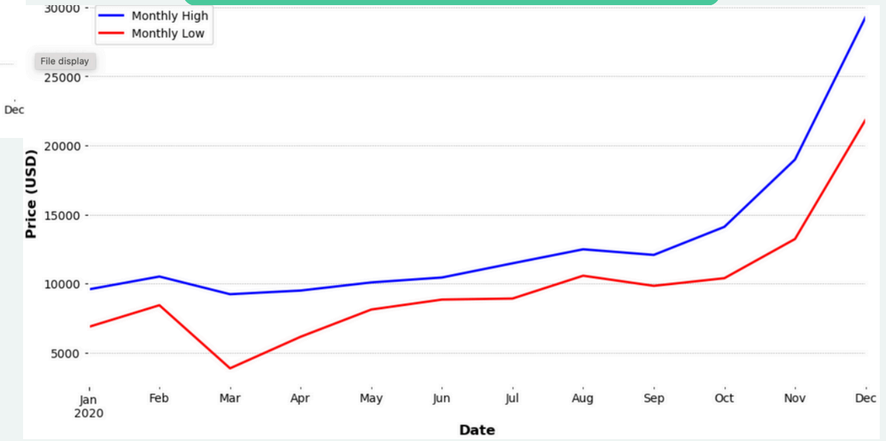
2021



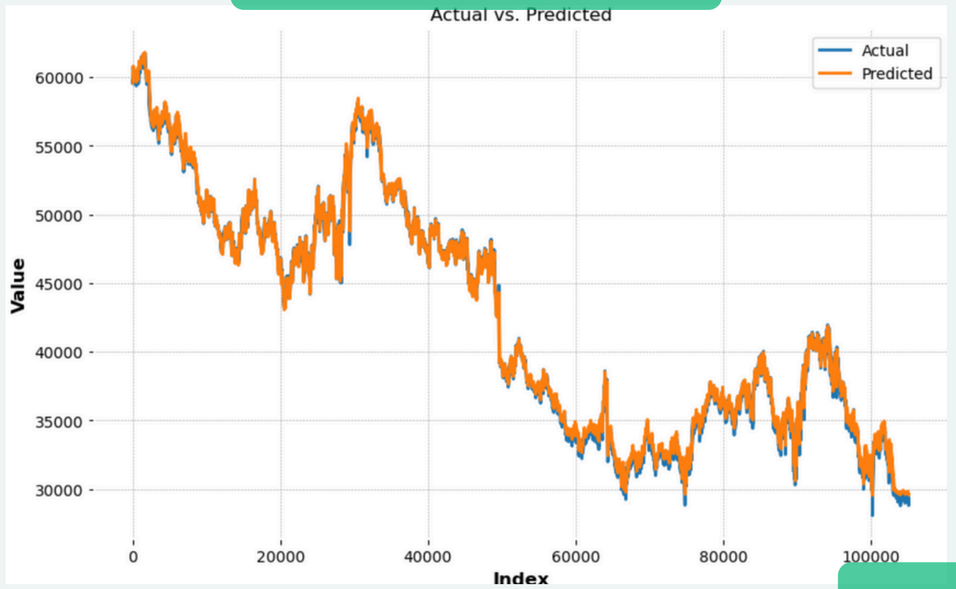
2019



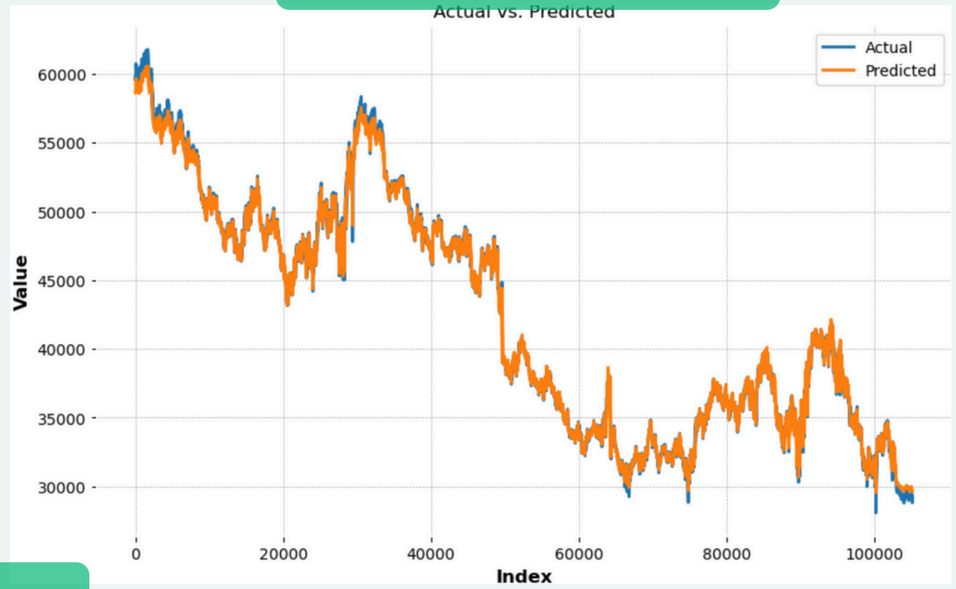
2020



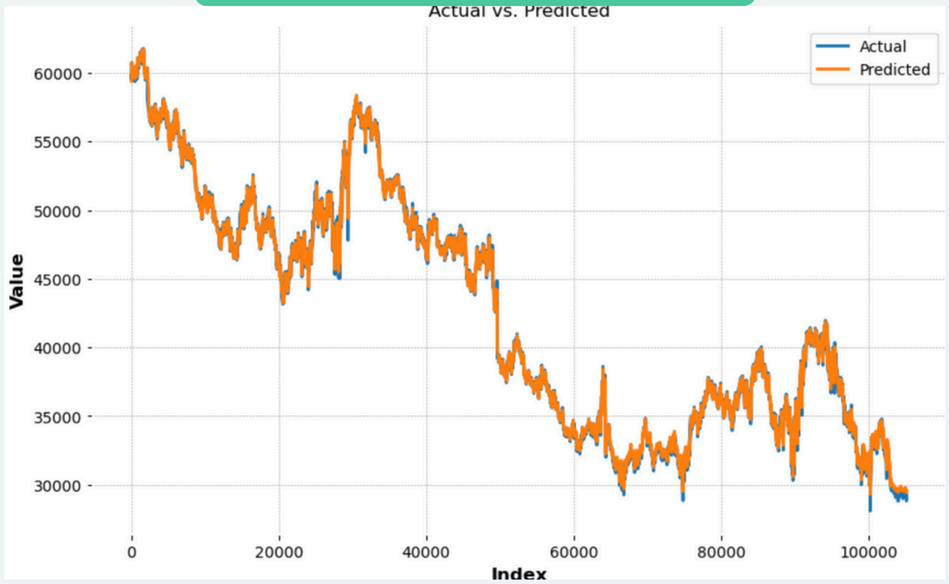
LSTM



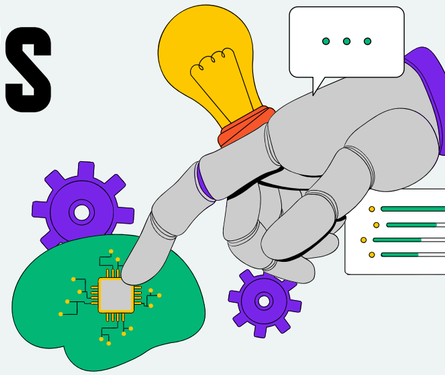
GRU



Bidirectional LSTM



COMPARATIVE ANALYSIS OF MODELS AND RESULTS



LSTM

Without Scaling the Data:

```
Mean Squared Error: 1872385322.9629145
Mean Absolute Error: 42412.556121079026
Root Mean Squared Error: 43271.06796651678
```

With Scaling the Data:

```
Mean Squared Error: 60239.480850247135
Mean Absolute Error: 186.7613003809997
Root Mean Squared Error: 245.43732570708787
```

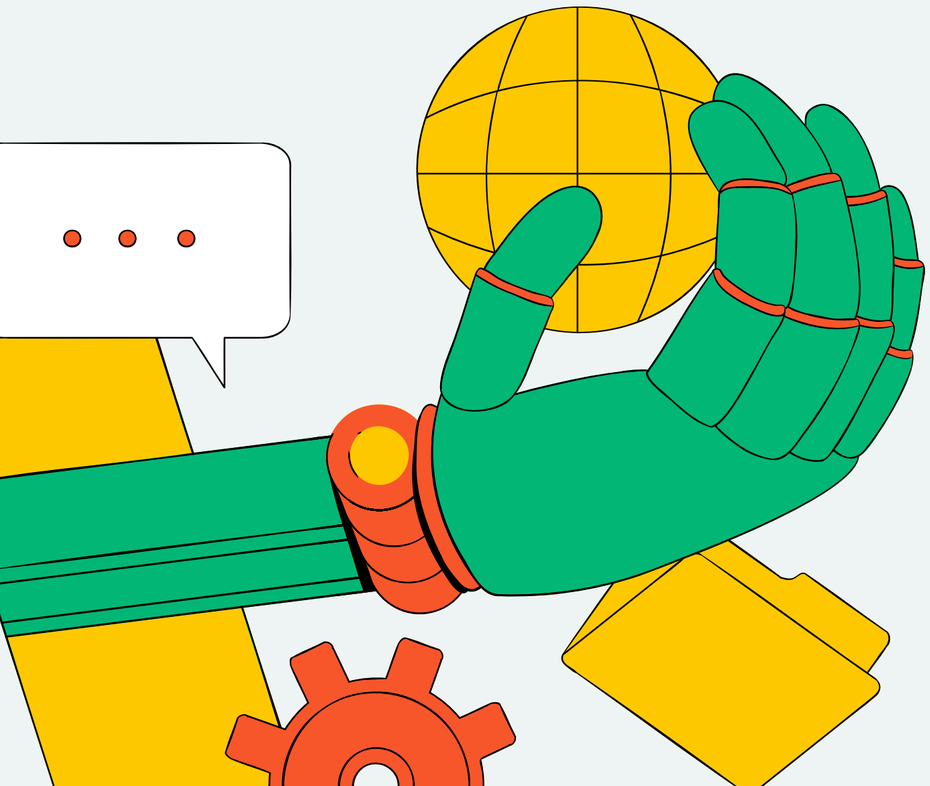
Bidirectional LSTM

```
Mean Squared Error: 22259.101525049915
Mean Absolute Error: 109.75640036702623
Root Mean Squared Error: 149.19484416376432
```

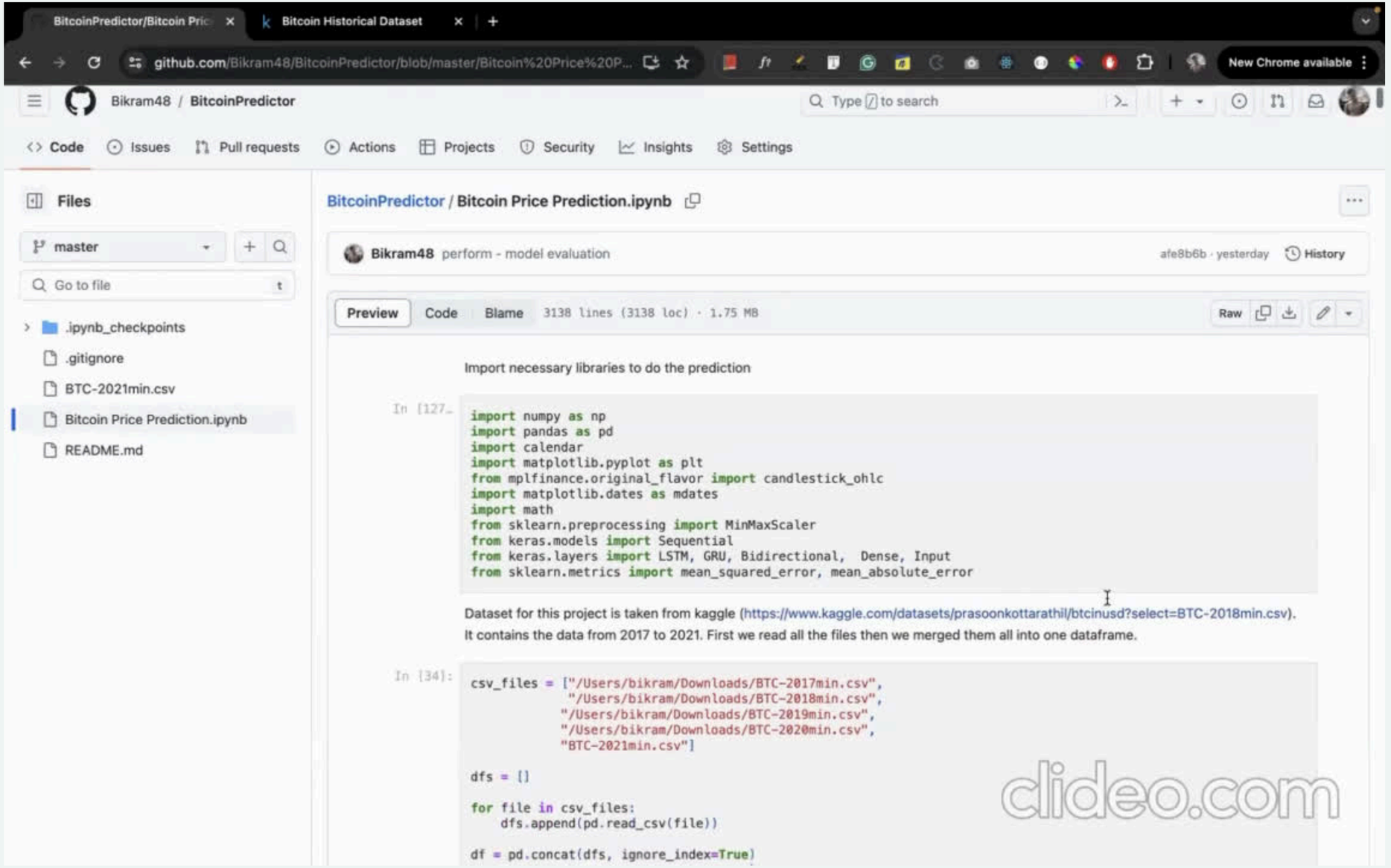
GRU

```
Mean Squared Error: 60873.588352606595
Mean Absolute Error: 145.2698350544965
Root Mean Squared Error: 246.72573508372935
```

RESULTS AND ACHIEVEMENTS:



In conclusion, Bidirectional LSTM model appears to be the most reliable for forecasting Bitcoin prices with a higher level of accuracy and consistency. It may benefit from further tuning, possibly by incorporating additional data or through ensemble methods that could leverage the strengths of multiple predictive models. Ultimately, the objective would be to continue enhancing the model to ensure robustness and adaptability to the volatile nature of cryptocurrency markets.


BitcoinPredictor/Bitcoin Pric
Bitcoin Historical Dataset
github.com/Bikram48/BitcoinPredictor/blob/master/Bitcoin%20Price%20P...
New Chrome available
Bikram48 / BitcoinPredictor
Type / to search
Code
Issues
Pull requests
Actions
Projects
Security
Insights
Settings
Files
master
Go to file
t
.ipynb_checkpoints
.gitignore
BTC-2021min.csv
Bitcoin Price Prediction.ipynb
README.md
BitcoinPredictor / Bitcoin Price Prediction.ipynb
Bikram48 perform - model evaluation
afe8b6b · yesterday
History
Preview
Code
Blame
3138 lines (3138 loc) · 1.75 MB
Raw
Import necessary libraries to do the prediction
In [127_
import numpy as np
import pandas as pd
import calendar
import matplotlib.pyplot as plt
from mplfinance.original_flavor import candlestick_ohlc
import matplotlib.dates as mdates
import math
from sklearn.preprocessing import MinMaxScaler
from keras.models import Sequential
from keras.layers import LSTM, GRU, Bidirectional, Dense, Input
from sklearn.metrics import mean_squared_error, mean_absolute_error
Dataset for this project is taken from kaggle (https://www.kaggle.com/datasets/prasoonkottarathil/btcinusd?select=BTC-2018min.csv).
It contains the data from 2017 to 2021. First we read all the files then we merged them all into one dataframe.
In [34]:
csv_files = ["/Users/bikram/Downloads/BTC-2017min.csv",
"/Users/bikram/Downloads/BTC-2018min.csv",
"/Users/bikram/Downloads/BTC-2019min.csv",
"/Users/bikram/Downloads/BTC-2020min.csv",
"BTC-2021min.csv"]
dfs = []
for file in csv_files:
dfs.append(pd.read_csv(file))
df = pd.concat(dfs, ignore_index=True)
clideo.com

THANK YOU