GOVERNMENT ENGINEERING COLLEGE, BILASPUR [C.G.]

Bitcoin Price Prediction

Submitted By

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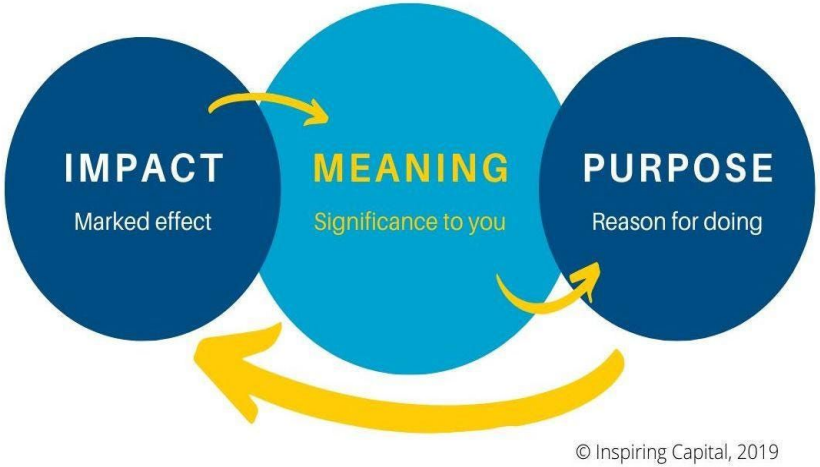
PROJECT PURPOSE

To find out with what accuracy the direction of the price of Bitcoin can be predicted using machine learning methods.



BITCOIN

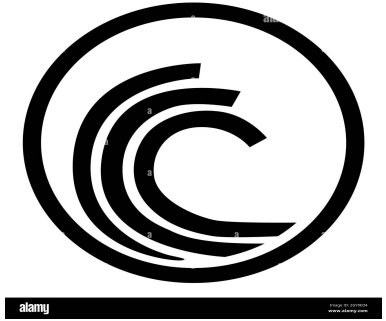
By Satoshi Nakamoto

BTC PRICE PREDICTION

CRYPTOCURRENCIES

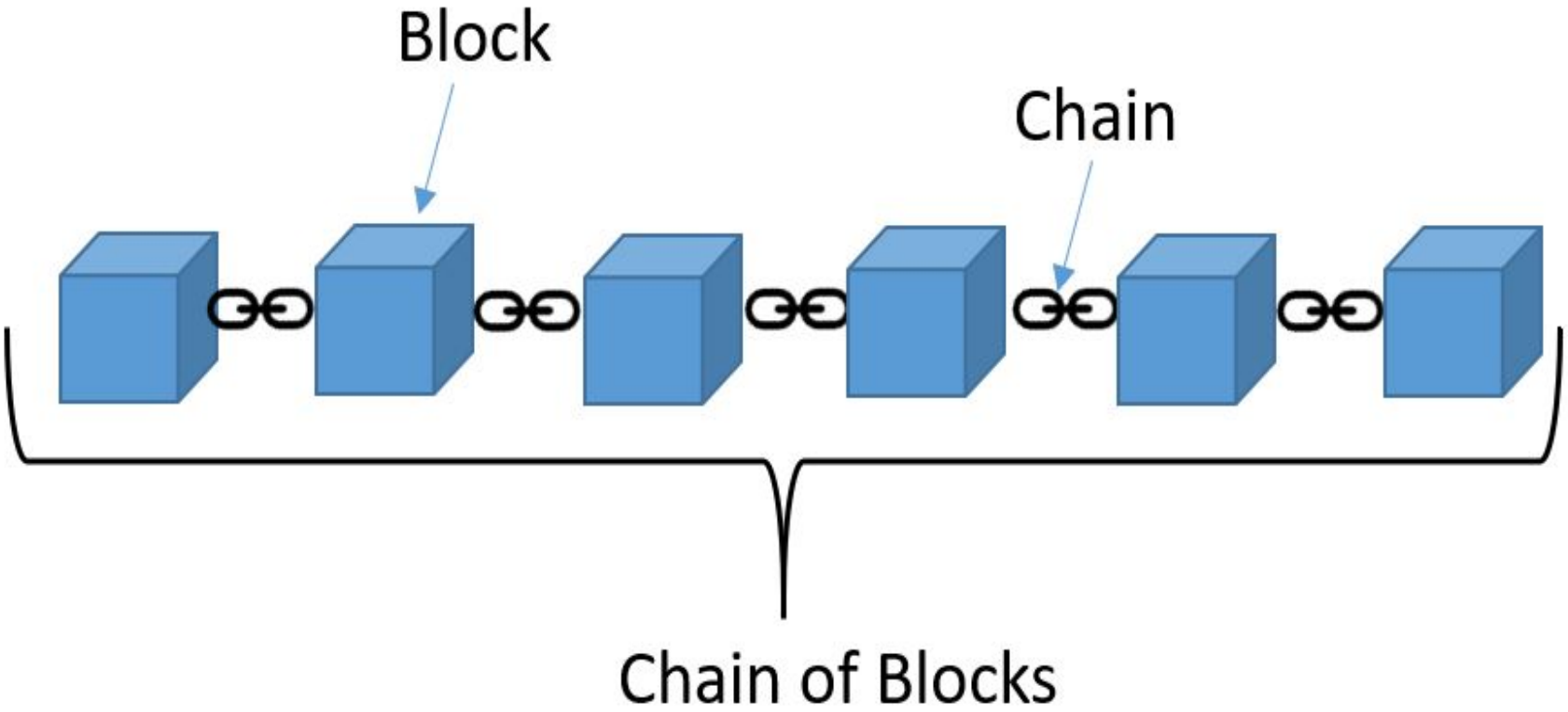
SOLANA

ethereum



polygon

BLOCKCHAIN TECHNOLOGY



EVOLUTION OF MONEY

CoinDCX

Digital Cryptocurrency Exchange

COINSWITCH

KUBER

TOOLS AND TECHONOLOGY

LIBRARIES USED

1)NUMPY

2)PANDAS

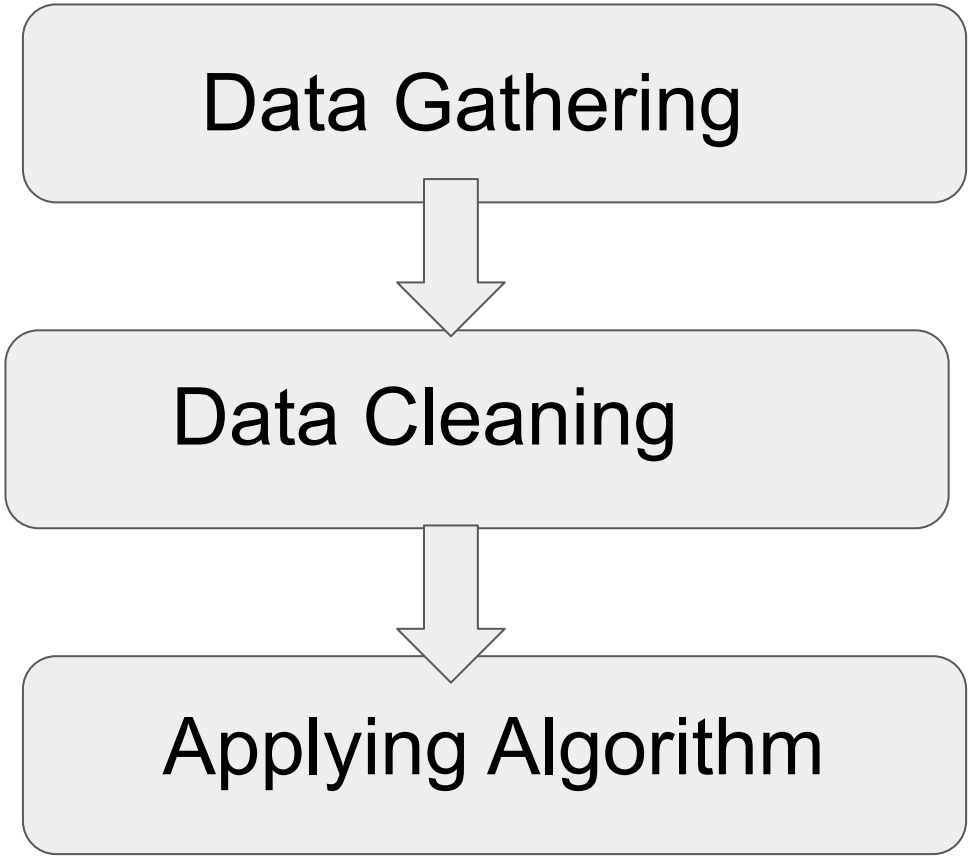
3)SCIKIT LEARN

4)KERAS

5)MATPLOTLIB

6)SEABORN

STEPS



DATA GATHERING

Bitcoin Data

5 years

2017-01-07 2022-01-07

DATA CLEANING

```
[ ] data=pd.read_csv("/content/drive/MyDrive/Colab Notebooks/BTC-USD(1)-5year.csv")
    data.head()
```

	Date	Open	High	Low	Close	Adj Close	Volume
0	2017-01-07	903.487000	908.585022	823.556030	908.585022	908.585022	279550016
1	2017-01-08	908.174988	942.723999	887.249023	911.198975	911.198975	158715008
2	2017-01-09	913.244019	913.685974	879.807007	902.828003	902.828003	141876992
3	2017-01-10	902.440002	914.872986	901.059998	907.679016	907.679016	115808000
4	2017-01-11	908.114990	919.447998	762.765015	777.757019	777.757019	310928992

DATA CLEANING

NULL Values

```
data.isnull().sum()
```

```
Date          0
Open          0
High          0
Low           0
Close         0
Adj Close     0
Volume        0
dtype: int64
```

Duplicates

```
data.duplicated().sum()
```

```
0
```

Shape

```
data.shape
```

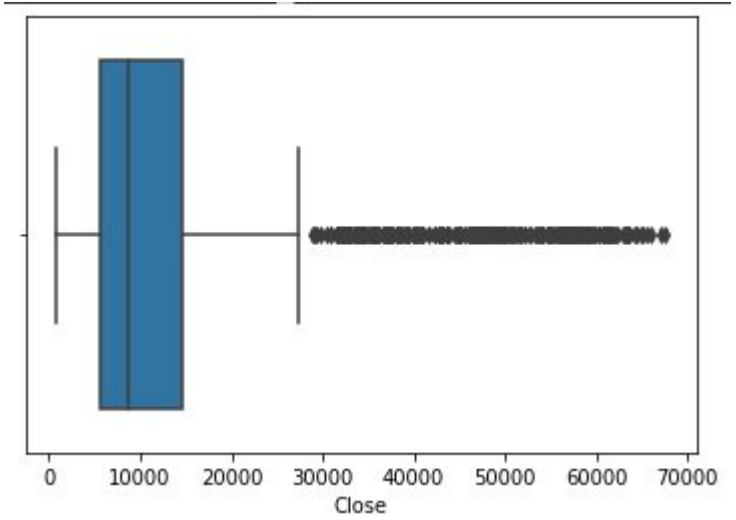
```
(1827, 7)
```

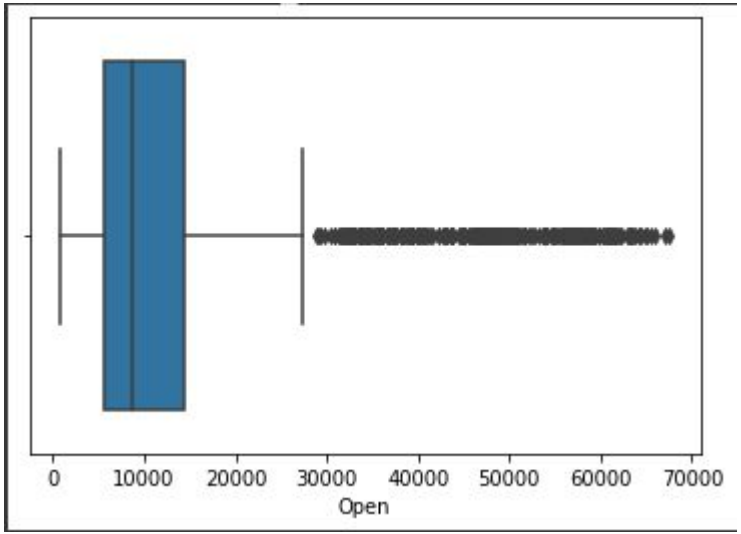
DESCRIPTION

```
data.describe()
```

	Open	High	Low	Close	Adj Close	Volume
count	1827.000000	1827.000000	1827.000000	1827.000000	1827.000000	1.827000e+03
mean	15644.242979	16072.802578	15173.115305	15664.319233	15664.319233	2.120644e+10
std	17061.484624	17526.956422	16521.798766	17064.090826	17064.090826	2.117641e+10
min	775.177979	823.307007	755.755981	777.757019	777.757019	6.085170e+07
25%	5612.299805	5801.653809	5475.665039	5635.375000	5635.375000	4.652720e+09
50%	8689.746094	8871.753906	8471.212891	8706.245117	8706.245117	1.661073e+10
75%	14479.649903	15361.799805	13658.300293	14600.950195	14600.950195	3.278167e+10
max	67549.734375	68789.625000	66382.062500	67566.828125	67566.828125	3.509679e+11

BOX PLOT


0
10000
20000
30000
40000
50000
60000
70000
Close


0
10000
20000
30000
40000
50000
60000
70000
Open

TREATING OUTLIERS

```
Q1=data.quantile(0.25)
Q3=data.quantile(0.75)
IQR=Q3 - Q1
IQR
```

```
Open          8.867350e+03
High          9.560146e+03
Low           8.182635e+03
Close         8.965575e+03
Adj Close     8.965575e+03
Volume        2.812895e+10
dtype: float64
```

```
] maxThresholdOpen= data['Open'].quantile(0.79)
  avgOpen  = data['Open'].quantile(0.75)
  print(maxThresholdOpen)
  print(avgOpen)
```

```
22982.873788859986
14479.649902500001
```

TREATING OUTLIERS

```
data[data['Open']>maxThresholdOpen]
```

	Date	Open	High	Low	Close	Adj Close	Volume
1442	2020-12-19	23132.865234	24085.855469	22826.472656	23869.832031	23869.832031	38487546580
1443	2020-12-20	23861.765625	24209.660156	23147.710938	23477.294922	23477.294922	37844228422
1444	2020-12-21	23474.455078	24059.982422	22159.367188	22803.082031	22803.082031	45852713981
1446	2020-12-23	23781.974609	24024.490234	22802.646484	23241.345703	23241.345703	51146161904
1447	2020-12-24	23240.203125	23768.337891	22777.597656	23735.949219	23735.949219	41080759713
...	...	...	...	...	...	...	...
1822	2022-01-03	47343.542969	47510.726563	45835.964844	46458.117188	46458.117188	33071628362
1823	2022-01-04	46458.851563	47406.546875	45752.464844	45897.574219	45897.574219	42494677905
1824	2022-01-05	45899.359375	46929.046875	42798.222656	43569.003906	43569.003906	36851084859
1825	2022-01-06	43565.511719	43748.718750	42645.539063	43160.929688	43160.929688	30208048289
1826	2022-01-07	43152.972656	43152.972656	41270.468750	42296.957031	42296.957031	62833045504

384 rows × 7 columns

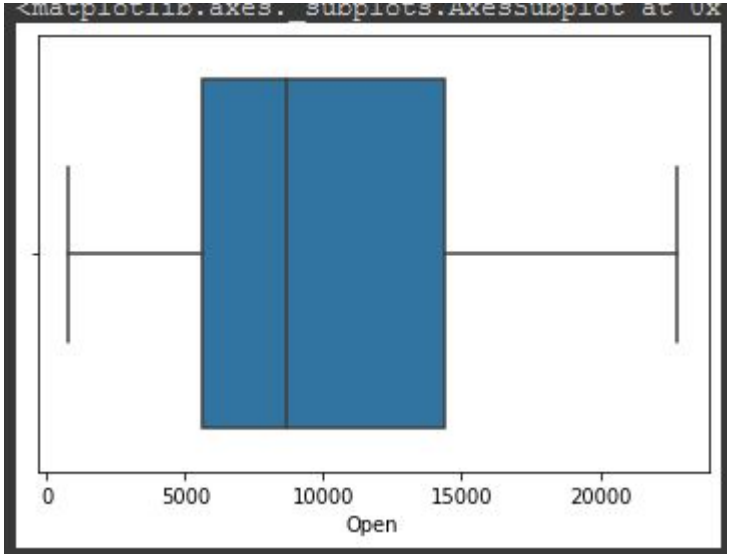
TREATING OUTLIERS

```
[ ] data['Open'] = np.where(data['Open'] > maxThresholdOpen,avgOpen,data['Open'])
```

```
[ ] data['Open'].describe()
```

```
count     1827.000000
mean      8876.916715
std       4532.445924
min        775.177979
25%       5612.299805
50%       8689.746094
75%      14425.224854
max      22806.796875
Name: Open, dtype: float64
```

AFTER TREATING



MODELS

1. LINEAR REGRESSION
2. ARIMA [Autoregressive Integrated Moving Averages]
3. RNN - LSTM [Long short term memory]

LINEAR REGRESSION

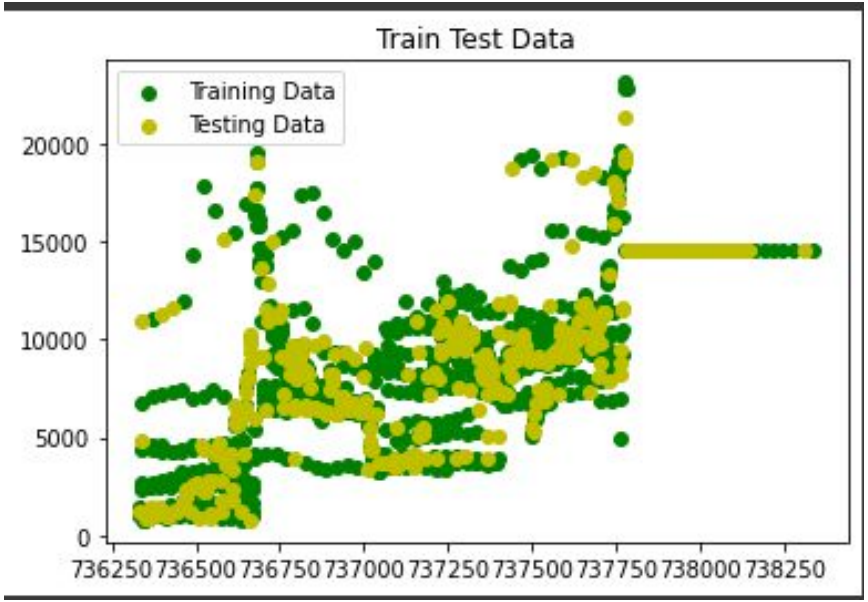
$$y = mx + c$$

$$m = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sum (x - \bar{x})^2}$$

$$R^2 = \frac{\sum (y_p - \bar{y})^2}{\sum (y - \bar{y})^2}$$

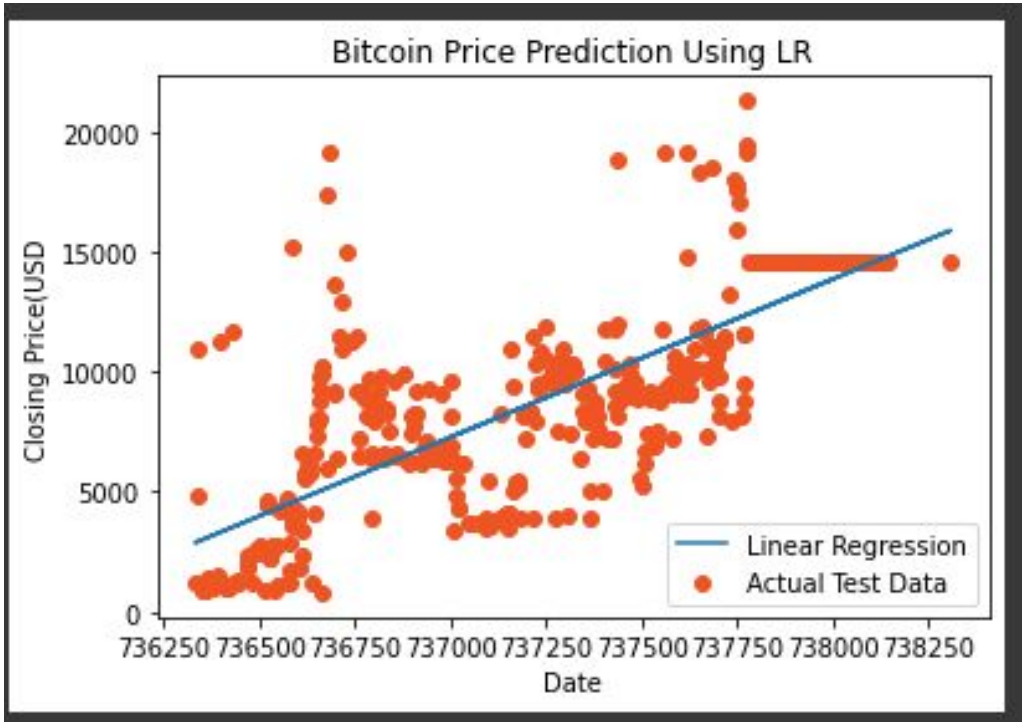
LINEAR REGRESSION

Initial Plot



Train vs Test data

LINEAR REGRESSION



score=0.62

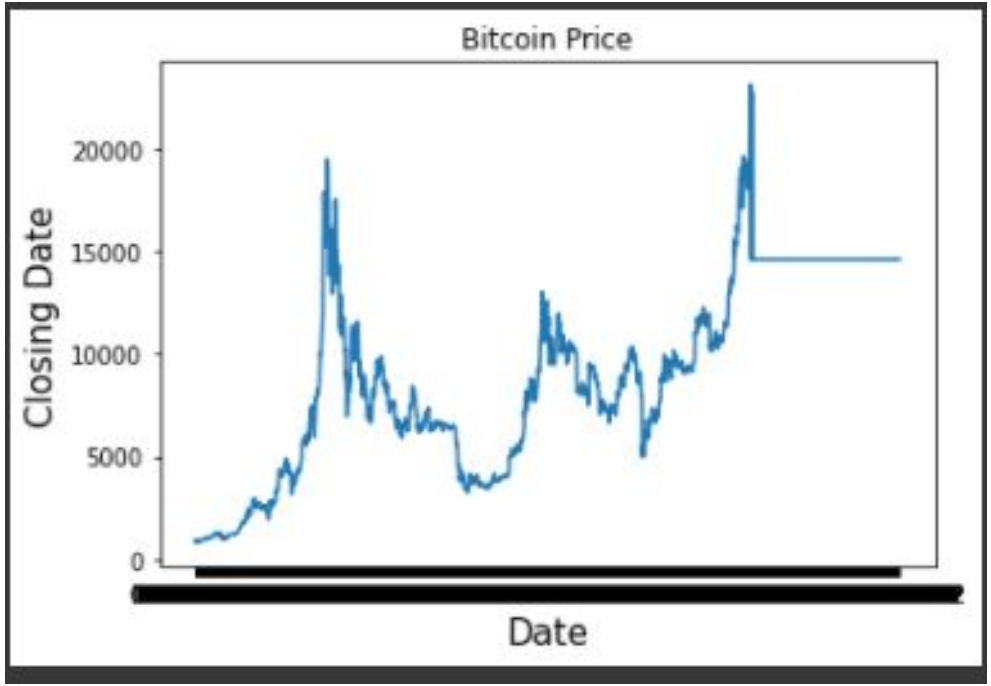
ARIMA

Autoregressive Integrated Moving Averages

P : AutoRegressive

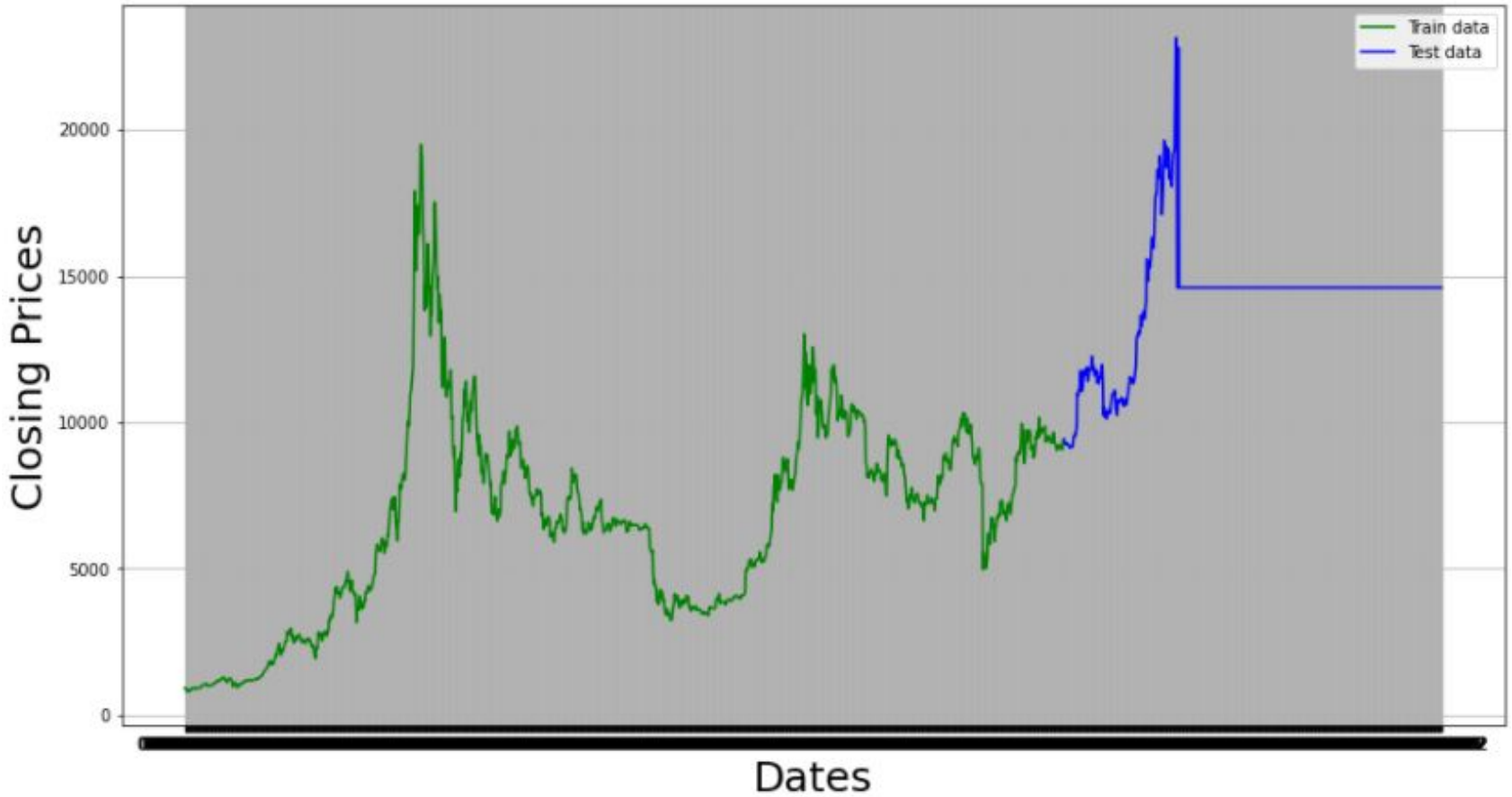
D : Integrated

Q : Moving Averages



SPLIT DATA INTO TRAINING AND TESTING

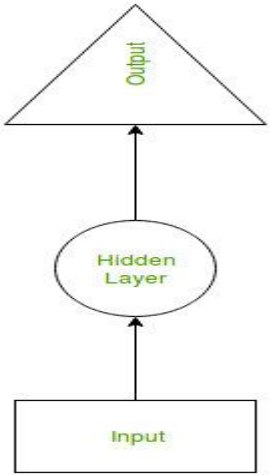
```
#split data into training and testing
plt.figure(figsize=(15,8))
plt.grid(True)
plt.xlabel('Dates',fontsize = 25)
plt.ylabel('Closing Prices', fontsize = 25)
plt.plot(da[0:to_row]['Adj Close'],'green',label ='Train data')
plt.plot(da[to_row:]['Adj Close'],'blue',label ='Test data')
plt.legend()
```


Train data
Test data
20000
15000
10000
5000
0
Closing Prices
Dates


Bitcoin Price Prediction
BTC Prediction
BTC Actual price
22500
20000
17500
15000
12500
10000
7500
5000
Price
Date

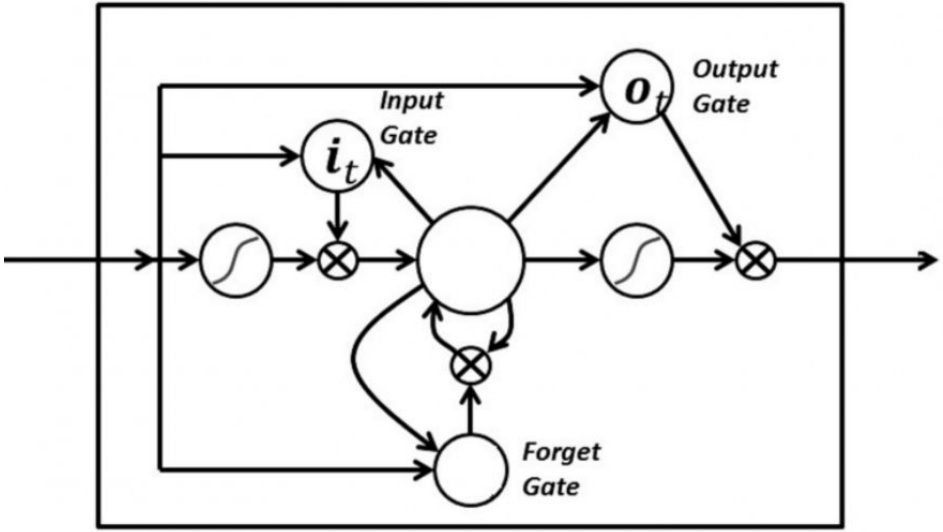
RNN

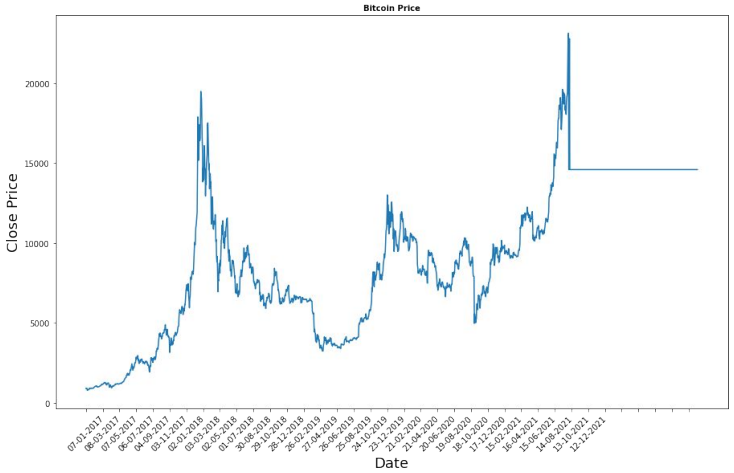
RNN(Recurrent Neural Network) are a tpe of Neural Network where output from previous steps are fed as input to current step.It has some sort of Internal memory.

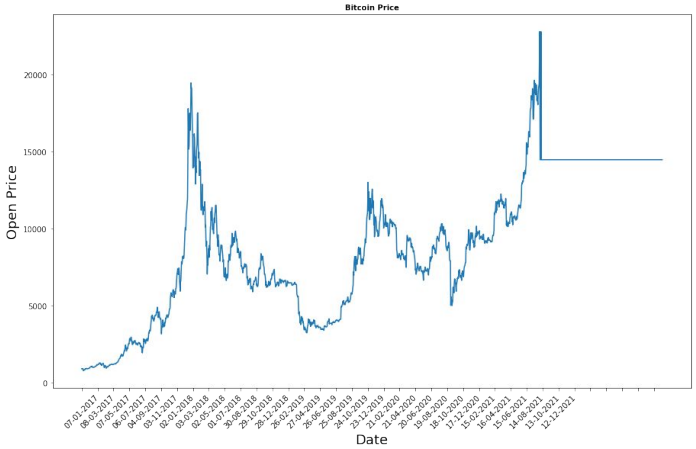


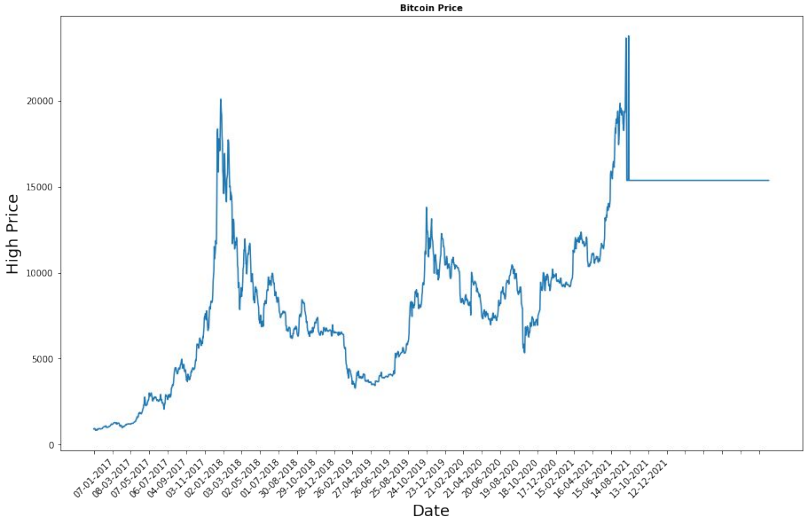
LSTM

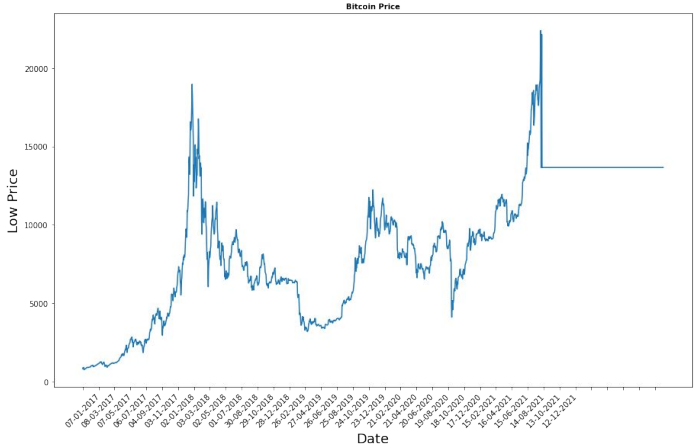
It is special kind of recurrent neural network that is capable of learning long term dependencies in data. This is achieved because the recurring module of the model has a combination of four layers interacting with each other.

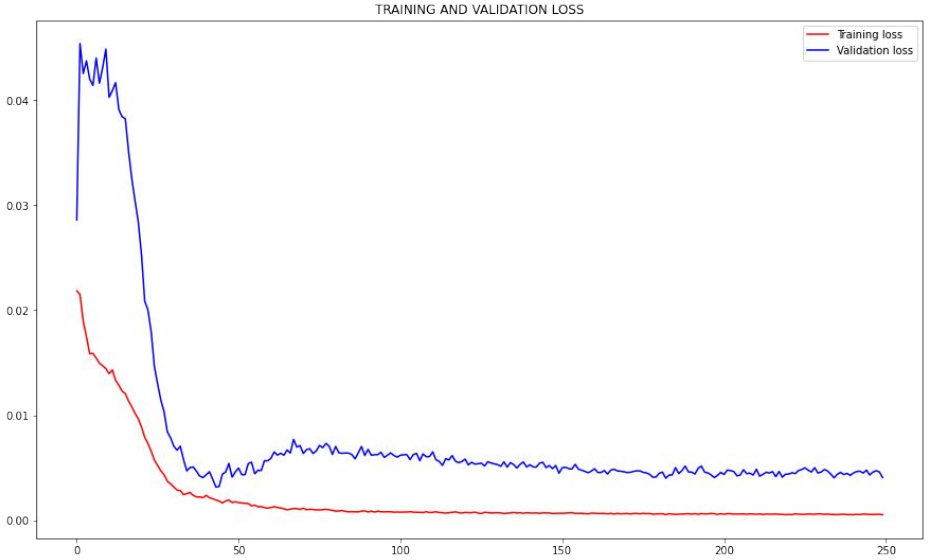


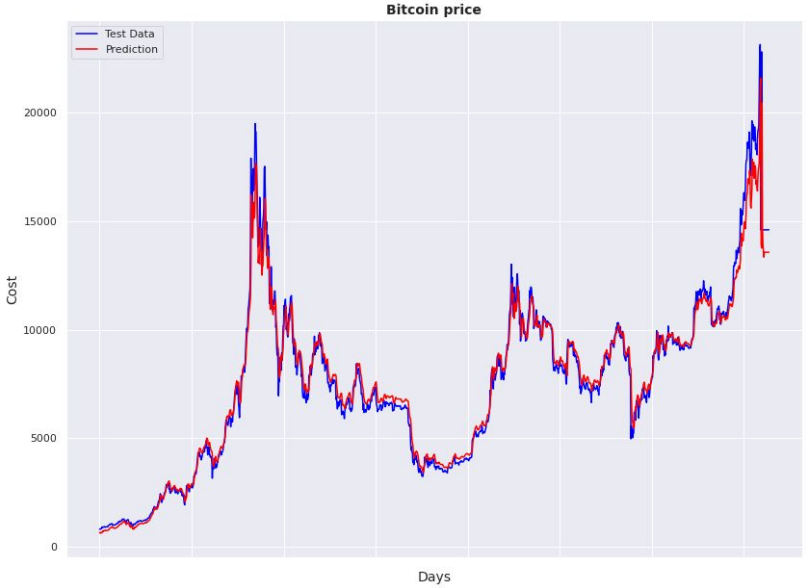

Bitcoin Price
Close Price
Date


Bitcoin Price
Open Price
Date


Bitcoin Price
High Price
Date


Bitcoin Price
Low Price
Date


TRAINING AND VALIDATION LOSS
Training loss
Validation loss
0.04
0.03
0.02
0.01
0.00
0
50
100
150
200
250


Bitcoin price
Test Data
Prediction
20000
15000
10000
5000
0
Cost
Days

FUTURE ENHANCEMENT

- Web Integration
- For large amount of data
- For different Cryptocurrency

THANK YOU !!!