Cryptocurrency price forecasting

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I. Introduction

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Research paper

Cryptocurrency Price Forecasting Using Machine Learning: Building Intelligent Financial Prediction Models

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Cryptocurrency price forecasting – A comparative analysis of ensemble learning and deep learning methods

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II. Data and Methodology

1. Data processing

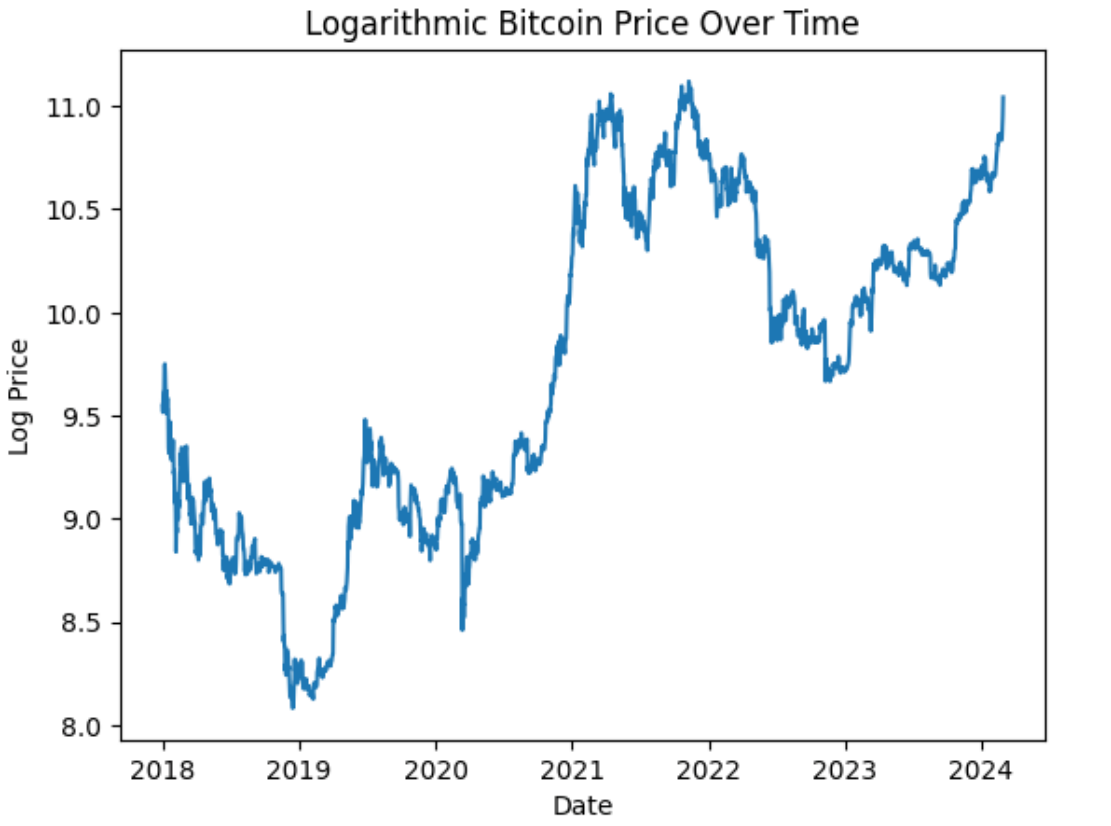
BTC-USD

```
Data columns (total 7 columns):
 #   Column      Non-Null Count  Dtype
---  ------      --------------  -----
 0   Date        2250 non-null   object
 1   Open        2250 non-null   float64
 2   High        2250 non-null   float64
 3   Low         2250 non-null   float64
 4   Close       2250 non-null   float64
 5   Volume      2250 non-null   float64
 6   Market Cap  2250 non-null   float64
```

	Open	High	Low	Close	Volume	Market Cap
count	2250.000000	2250.000000	2250.000000	2250.000000	2.250000e+03	2.250000e+03
mean	22343.137322	22854.586331	21805.439057	22365.854563	4.247632e+10	4.208112e+11
std	16248.746436	16647.585143	15827.388275	16269.696713	3.449772e+10	3.120267e+11
min	3239.810072	3269.710130	3188.542617	3236.700910	2.039620e+09	5.632816e+10
25%	8442.585971	8645.723472	8197.471602	8446.854302	1.577712e+10	1.482500e+11
50%	18209.195785	18682.766050	17652.921135	18293.466325	3.493959e+10	3.400000e+11
75%	34568.277500	35310.321970	33510.794255	34568.167500	6.222844e+10	6.547500e+11
max	67510.919420	68769.955370	66358.933600	67500.024740	2.120000e+11	1.270000e+12

II. Data and Methodology

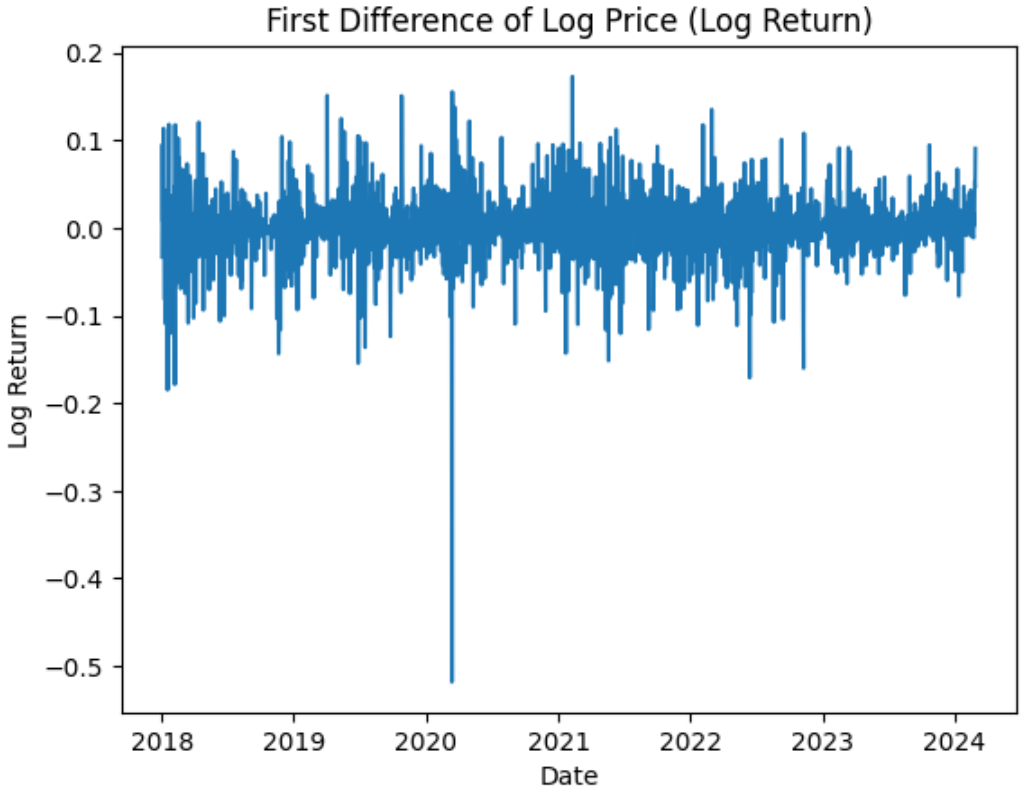
1. Data processing



II. Data and Methodology

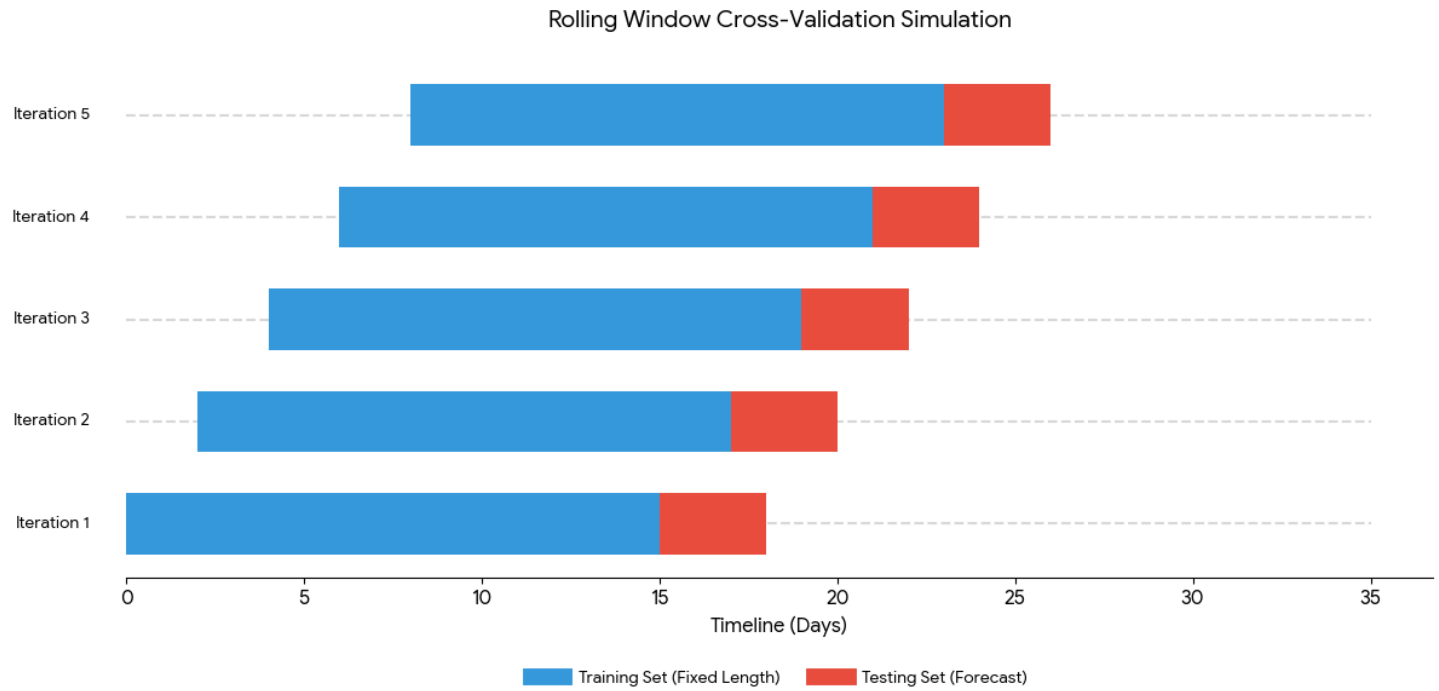
1. Data processing

$$\Delta y_t = \ln(P_t) - \ln(P_{t-1}) = \ln\left(\frac{P_t}{P_{t-1}}\right)$$

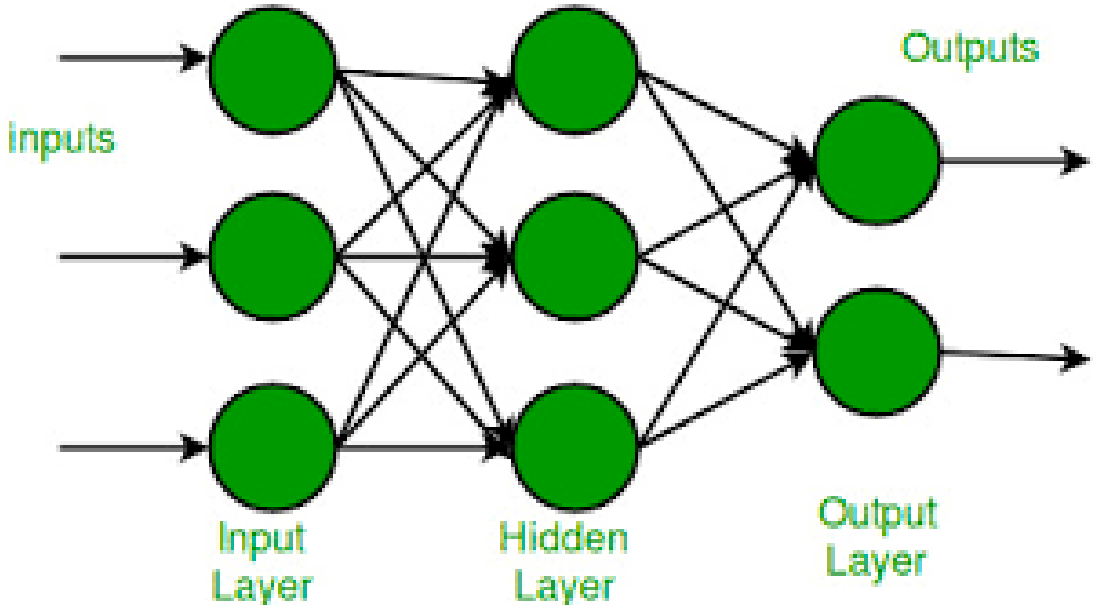


II. Data and Methodology

1. Data processing

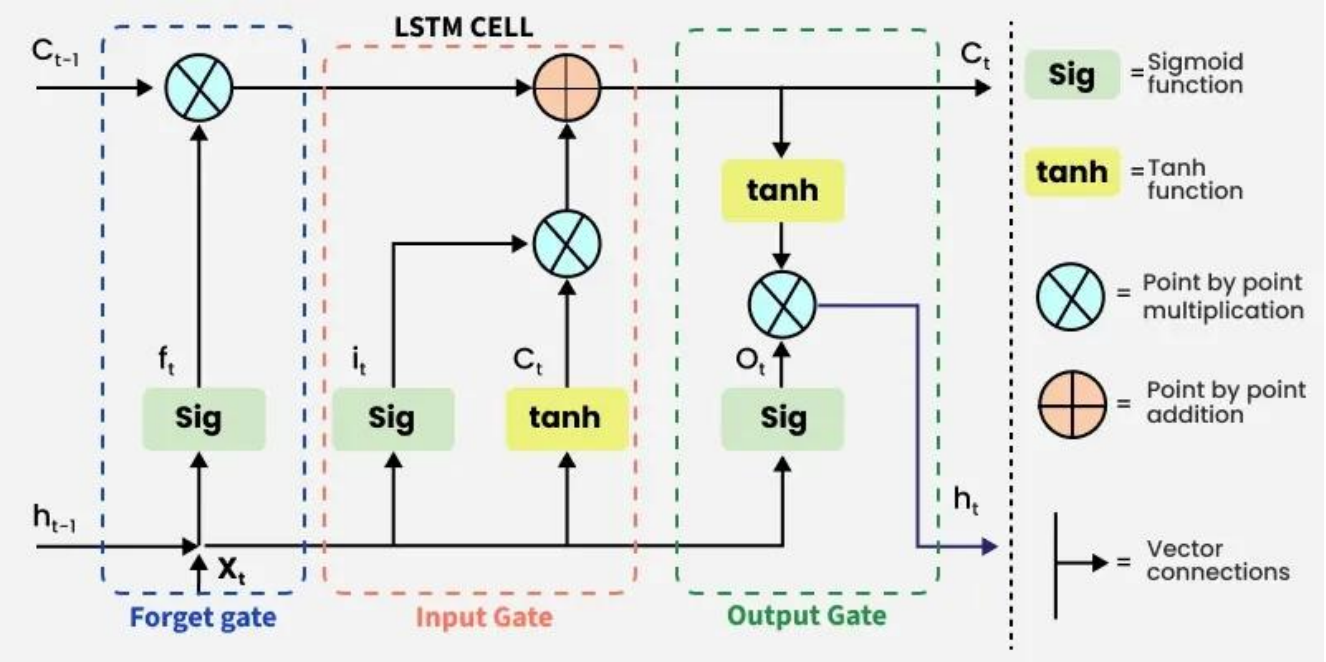


1. Machine learning model



GreeksforGeeks

1. Deep learning model



III. Evaluation Metrics and Results

Evaluation Metrics

1. Regression Metrics

- RMSE
- MAE

$$RMSE = \sqrt{MSE}$$

$$MAE = \frac{1}{n}\sum |y_i - \hat{y}_i|$$

Evaluation Metrics

2. Investor Performance Metrics

- MDA (Mean Directional Accuracy: MDA+ & MDA-)
- Return Score

Results

```
================ FINAL RESULTS ================
       Period Model      RMSE       MAE  MDA (%)   MDA+ (%)  \
0   Pre-Covid   MLP  0.027208  0.021021     40.0  42.857143
1   Pre-Covid  LSTM  0.027931  0.020824     46.0  33.333333
2  Post-Covid   MLP  0.027359  0.018991     50.0  65.517241
3  Post-Covid  LSTM  0.025791  0.018031     50.0  68.965517

   Total Return (Log)
0            0.166259
1            0.070380
2            0.108530
3            0.121264
```

```
================ FINAL RESULTS ================
       Period Model      RMSE       MAE  MDA (%)   MDA+ (%)  \
0   Pre-Covid   MLP  0.028639  0.022054     54.0  57.142857
1   Pre-Covid  LSTM  0.027237  0.019705     52.0  38.095238
2  Post-Covid   MLP  0.025800  0.019019     60.0  65.517241
3  Post-Covid  LSTM  0.025760  0.018222     58.0  75.862069

   Total Return (Log)
0            0.083753
1            0.121208
2            0.452190
3            0.335832
```

References

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Thank You !

Question?