

# Broke No More

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**Deep Learning for Financial  
Forecasting: Predicting Stock Prices in  
Dhaka Stock Exchange with LSTM**

# Team AI Broke-rs

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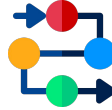
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# Introduction

For a good and successful investment, many investors are keen in knowing the future situation of the stock market. Good and effective prediction systems for stock market help traders, investors, and analyst by providing supportive information like the future direction of the stock market. In recent studies, Long Short-Term Memory (LSTM), a special type of recurrent neural network (RNN), are being used to make predictions of time series datasets. In this project, we have used RNN and LSTM approach to predict stock market indices of Dhaka Stock Exchange.

# Methodology



## Steps:

Data acquisition  
Dataset Construction  
Labelling  
Data Preprocessing  
Model Preparation  
Training and Fine tuning  
Result analysis

# Data Collection



# Data Collection

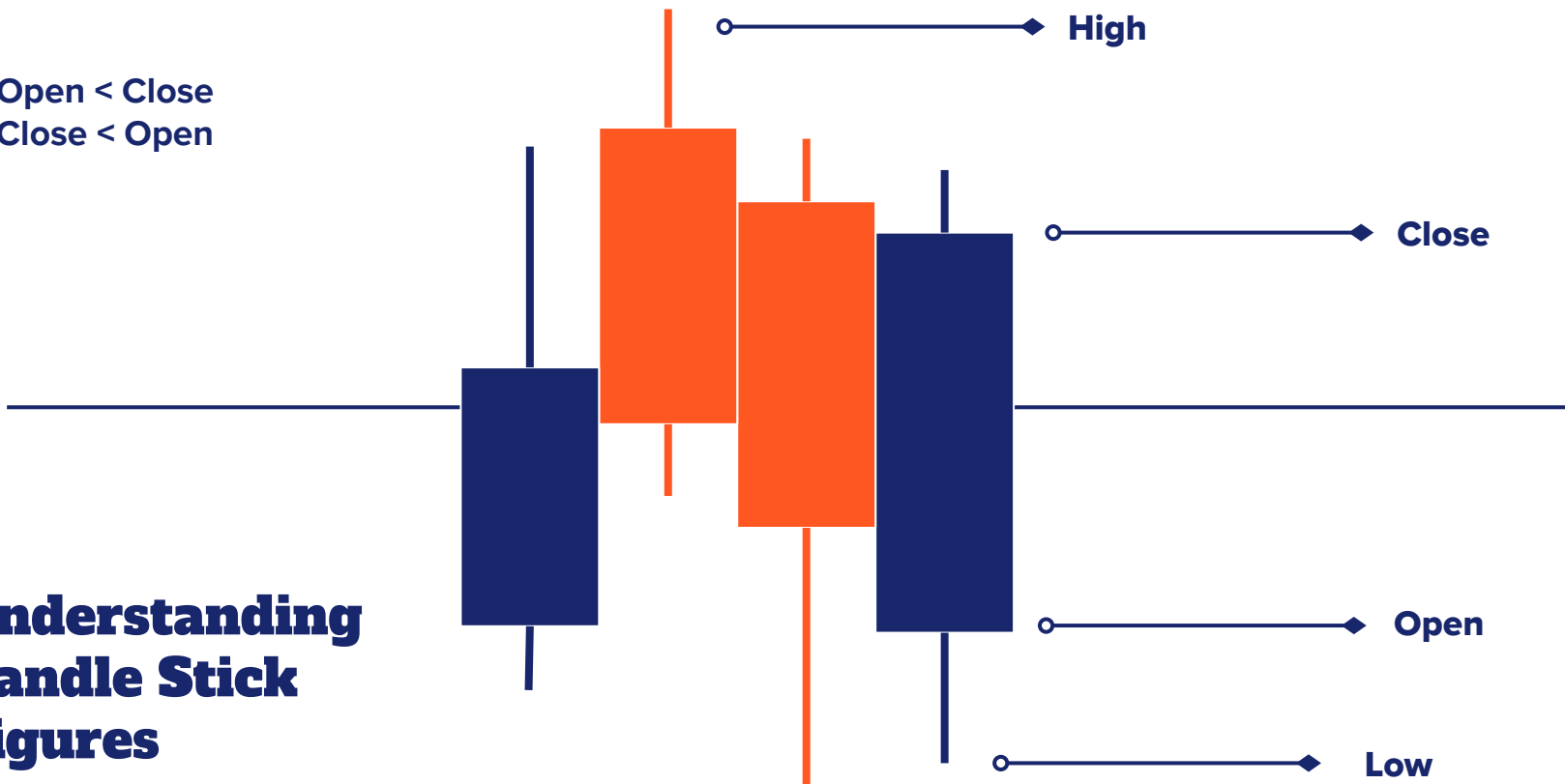
	date	trading_code	last_traded_price	high	low	opening_price	closing_price	yesterdays_closing_price	trade	value_mn	volume
0	2008-12-30	1STBSRS	823.00	840.00	819.0	825.0	826.25	825.75	86	4.1475	5000
1	2008-12-28	1STBSRS	817.00	829.00	802.0	802.0	825.75	790.00	59	2.7838	3400
2	2008-12-24	1STBSRS	789.00	809.75	786.0	790.0	790.00	785.75	74	3.5270	4450
3	2008-12-23	1STBSRS	785.00	798.50	785.0	785.0	785.75	782.50	38	2.0541	2600
4	2008-12-22	1STBSRS	778.25	794.50	775.5	787.0	782.50	797.75	19	0.7825	1000
...	...	...	...	...	...	...	...	...	...	...	...
103216	2021-01-07	ZEALBANGLA	199.90	204.00	192.5	204.0	199.90	203.30	149	1.9120	9623
103217	2021-01-06	ZEALBANGLA	203.30	209.00	186.0	209.0	203.30	193.60	507	7.8230	39403
103218	2021-01-05	ZEALBANGLA	183.00	193.90	183.0	193.9	193.60	176.30	154	8.7030	44935
103219	2021-01-04	ZEALBANGLA	176.30	176.30	176.3	176.3	176.30	160.30	51	1.6910	9590
103220	2021-01-03	ZEALBANGLA	160.30	160.30	150.0	150.0	160.30	145.80	166	3.0740	19522

1678355 rows × 11 columns

# Data Collection

- Open < Close
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## Understanding Candle Stick Figures

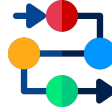


# Data Collection

	last_traded_price	high	low	opening_price	closing_price	yesterdays_closing_price	trade	value_mn	volume
date									
2008-03-06	600.0	603.0	585.00	590.00	592.5	591.0	191	10.5498	17800
2008-03-09	620.0	630.0	598.00	600.25	612.0	592.5	159	8.5562	14100
2008-03-09	620.0	630.0	598.00	600.25	612.0	592.5	159	8.5562	14100
2008-03-10	629.0	629.5	610.25	629.00	623.5	612.0	120	6.3999	10300
2008-03-11	618.0	635.0	600.00	634.00	613.5	623.5	350	19.6013	31850
...	...	...	...	...	...	...	...	...	...
2021-12-26	13.6	13.8	13.50	13.70	13.7	13.7	157	4.3070	315386
2021-12-27	13.8	13.9	13.60	13.70	13.8	13.7	129	2.8410	206311
2021-12-28	14.0	14.0	13.80	13.90	14.0	13.8	154	4.3400	311067
2021-12-29	13.8	14.1	13.80	14.00	13.9	14.0	184	4.0460	291370
2021-12-30	14.0	14.1	13.70	13.70	14.0	13.9	150	4.0000	288770



# Methodology



## Steps:

Data acquisition ✓

Dataset Construction ✓

Labelling ✓

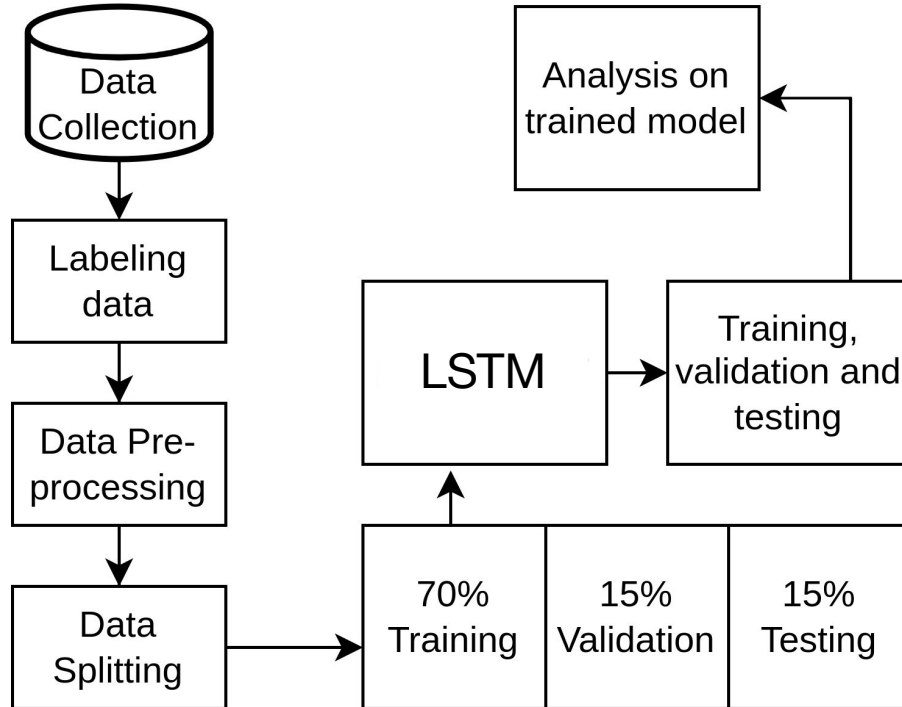
Data Preprocessing ✓

Model Preparation

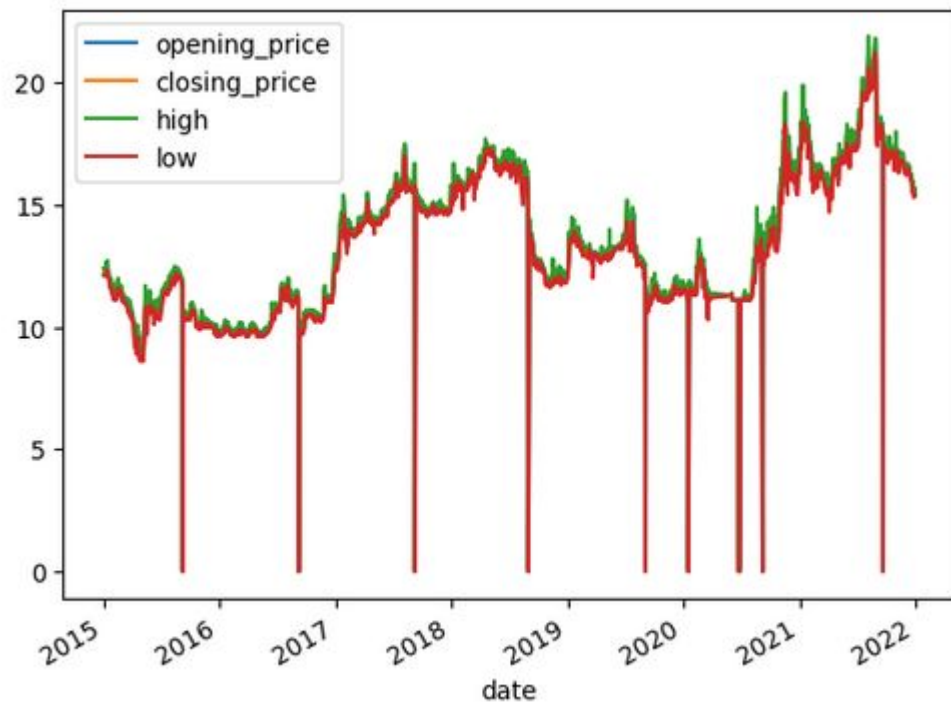
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Result analysis

# Methodology



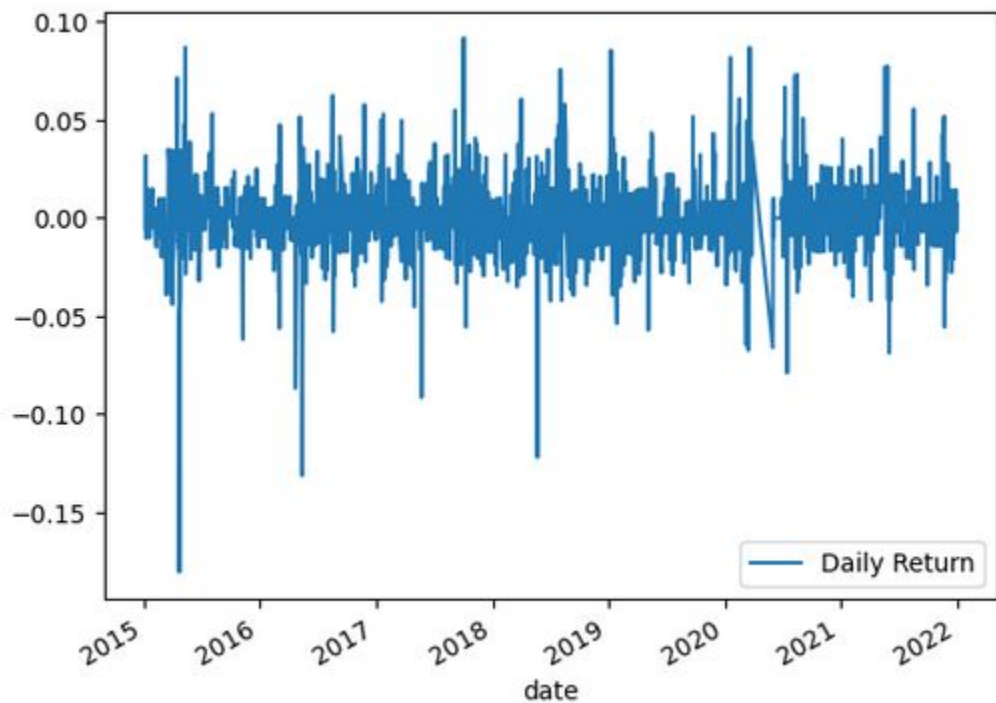
# Methodology



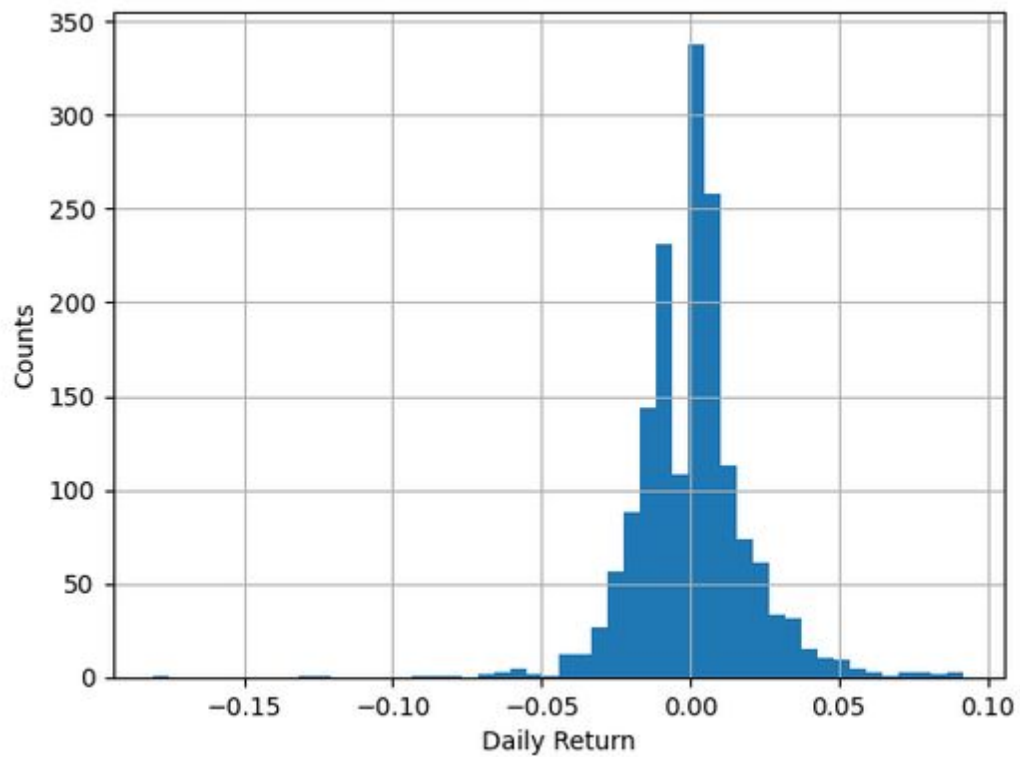
# Methodology



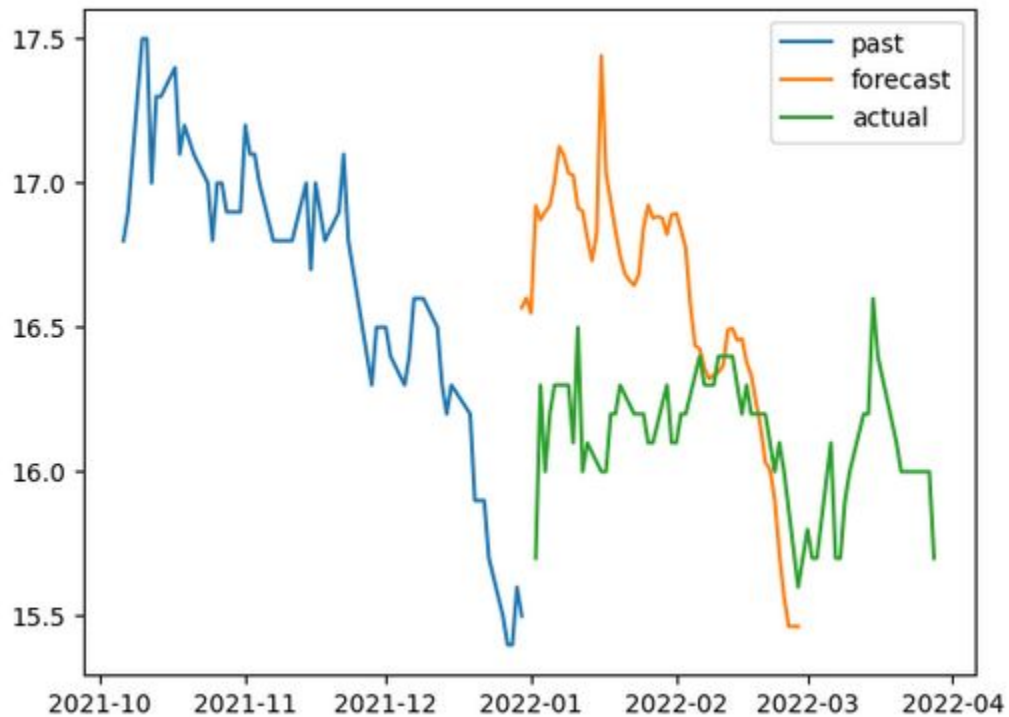
# Methodology



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# Outcome & Future Improvements

The current research on prediction of stock prices has an accuracy of 55.9% as of 2017 on the S&P index fund<sup>[1]</sup>. Despite our aim to surpass this accuracy, our efforts did not yield improved results. To enhance our prediction capabilities, we recognized the potential of utilizing transformers. Transformers, when combined with time2vec encoding, have shown promising results for time series data<sup>[2]</sup>.



# Relevant Papers & Datasets

- ❖ Stock market's price movement prediction with LSTM neural networks | IEEE Conference Publication
- ❖ Novel optimization approach for stock price forecasting using multi-layered sequential LSTM | ScienceDirect
- ❖ Stock market analysis prediction using lstm | Kaggle
- ❖ Dhaka Stock Exchange | Kaggle
- ❖ Daily data of Dhaka Stock Exchange | Kaggle
- ❖ Chittagong Stock Exchange dataset | Kaggle
- ❖ bdstockexchange

**! THANKS !**