Quant Club task 2 - Algorithmic Trading

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1 Choosing the NIFTY 50 Company

Company Chosen- **NTPC Reason:**

- Government Based - So stable stock prices
- Important Resource Company

Figure 1: NTPC STOCK CHART

2 Indicators used

The choice for Indicators used was made by research from various sources on internet and also suggestions by some YouTube videos. Also their complexity was taken in consideration.

- EMA
- SMA
- MACD
- RSI
- OBV

[49]:

Date	Open	High	Low	Close	Adj Close	Volume	MACD	Signal_line	up	down	RSI	SMA	EMA	action	OBV
2021-03-23 00:00:00	110.000000	110.199997	108.099998	108.650002	95.278107	14060206.0	0.000000	0.000000	NaN	NaN	NaN	NaN	108.650002	3.0	0.0
2021-03-24 00:00:00	108.000000	109.400002	105.599998	106.000000	92.954239	15196366.0	-0.211396	-0.042279	0.000000	-2.650002	NaN	NaN	108.397620	3.0	-15196366.0
2021-03-25 00:00:00	106.000000	106.500000	102.650002	103.000000	90.323463	22543755.0	-0.613927	-0.156609	0.000000	-3.000000	NaN	NaN	107.883561	3.0	-37740121.0
2021-03-26 00:00:00	105.750000	105.750000	103.699997	104.199997	91.375778	17402475.0	-0.826578	-0.290603	1.199997	0.000000	NaN	NaN	107.532746	2.0	-20337646.0
2021-03-30 00:00:00	105.849998	108.699997	104.599998	107.699997	94.445015	36129962.0	-0.704562	-0.373395	3.500000	0.000000	NaN	NaN	107.548674	1.0	15792316.0

Figure 2: Indicators made

3 Making the training dataset.

- Interval used- **2021-03-23 to 2024-01-01**

3.1 Making the Label i.e *ACTION*-

Labeled as

- BUY-0
- HOLD- 1
- SELL- 2

LOGIC USED:

- If today's close price is greater than today's open price- The stocks should be bought
- If today's close price is less than today's open price, then we see tomorrow's close price. If tomorrow's close price is greater than today's open price then we should **HOLD** the stock.
- If If tomorrow's close price is less than today's open price then we should **SELL** the stock.

Date	Open	High	Low	Close	Adj Close	Volume	MACD	Signal_line	up	down	RSI	OBV	SMA	EMA	action
2021-05-07 00:00:00	104.000000	105.500000	103.349998	105.050003	92.121170	13229291.0	-0.359234	-0.888131	2.000000	0.000000	58.333350	0.0	103.540001	103.392495	0.0
2021-05-10 00:00:00	106.000000	108.000000	105.599998	107.699997	94.445015	23980945.0	0.017408	-0.707023	2.649994	0.000000	79.124547	0.0	103.508334	103.802733	0.0
2021-05-11 00:00:00	108.000000	113.400002	106.699997	112.699997	98.829651	45613487.0	0.711160	-0.423386	5.000000	0.000000	84.382846	0.0	103.731667	104.650092	0.0
2021-05-12 00:00:00	114.199997	116.750000	111.750000	113.300003	99.355820	62158914.0	1.294456	-0.079818	0.600006	0.000000	85.257990	0.0	104.075001	105.473893	2.0
2021-05-14 00:00:00	113.949997	113.949997	110.150002	111.400002	97.689651	16227312.0	1.585137	0.253173	0.000000	-1.900002	73.726536	0.0	104.315001	106.038284	2.0

Figure 3: Training Data

4 Training the Logistic Regression Model

Different than normal binary Logistic regression model, and classifies into 3 classes

- Rows containing NaN values removed
- Features used are the technical indicators made previously
- Done from scratch- made into numpy arrays and then used the appropriate mathematical functions and operations.
- Predicted label is "ACTION"