



STOCK DATA ANALYSIS (POWER BI)

Identify the various factors to
find the trend analysis in the
Stock Data

PROBLEM STATEMENT FOR STOCK DATA ANALYSIS

Objective: Perform a comprehensive analysis of the provided stock data to derive meaningful insights for decision-making and strategic planning.

Create a visual report (Power BI/Tableau) by using the data to get meaningful and essentials information.

RECOMMENDED ANALYSIS

Descriptive Analysis:

Calculate summary statistics for the 'Open,' 'High,' 'Low,' 'Close,' columns, including mean, median, minimum, maximum, and standard deviation.

Explore the distribution of closing prices ('Close') over the given period.

Trend Identification:

Compute the Exponential Moving Average (EMA) for the closing prices over a selected period (e.g., 10 days).

Identify potential buy or sell signals based on the relationship between closing prices and the EMA.

Performance Metrics:

Calculate daily returns and assess the overall relative strength index (RSI) over the given time frame.

Evaluate the stock's performance in terms of daily price change

DATA OVERVIEW

date	open	high	low	close	volume	Name
08-02-2013	15.07	15.12	14.63	14.75	8407500	AAL
11-02-2013	14.89	15.01	14.26	14.46	8882000	AAL
12-02-2013	14.45	14.51	14.1	14.27	8126000	AAL
13-02-2013	14.3	14.94	14.25	14.66	10259500	AAL
14-02-2013	14.94	14.96	13.16	13.99	31879900	AAL
15-02-2013	13.93	14.61	13.93	14.5	15628000	AAL
19-02-2013	14.33	14.56	14.08	14.26	11354400	AAL
20-02-2013	14.17	14.26	13.15	13.33	14725200	AAL
21-02-2013	13.62	13.95	12.9	13.37	11922100	AAL
22-02-2013	13.57	13.6	13.21	13.57	6071400	AAL
25-02-2013	13.6	13.76	13	13.02	7186400	AAL
26-02-2013	13.14	13.42	12.7	13.26	9419000	AAL
27-02-2013	13.28	13.62	13.18	13.41	7390500	AAL
28-02-2013	13.49	13.63	13.39	13.43	6143600	AAL
01-03-2013	13.37	13.95	13.32	13.61	7376800	AAL
04-03-2013	13.5	14.07	13.47	13.9	8174800	AAL
05-03-2013	14.01	14.05	13.71	14.05	7676100	AAL
06-03-2013	14.52	14.68	14.25	14.57	13243200	AAL
07-03-2013	14.7	14.93	14.5	14.82	9125300	AAL
08-03-2013	14.99	15.2	14.84	14.92	10593700	AAL
11-03-2013	14.85	15.15	14.71	15.13	6961800	AAL
12-03-2013	15.14	15.6	14.95	15.5	8999100	AAL
13-03-2013	15.54	16.2	15.48	15.91	11380000	AAL
14-03-2013	15.98	16.36	15.93	16.25	8383300	AAL

DATA DESCRIPTION

Date- The date activity is been recorded

Open- Opening value of the stock

High- High value(max price) of the Stock

Low- Low value(low_price) of the stock

Close- Closing value of the Stock

Name- Stock Name

ANALYSIS IN POWER QUERY

Imported all 14 stocks data to Power Query . (Date, Close Price, Name only)

	date	close	Name
1	08-02-2013	45.08	A
2	11-02-2013	44.6	A
3	12-02-2013	44.62	A
4	13-02-2013	44.75	A
5	14-02-2013	44.58	A
6	15-02-2013	42.25	A
7	19-02-2013	43.01	A
8	20-02-2013	42.24	A
9	21-02-2013	41.63	A
10	22-02-2013	41.8	A
11	25-02-2013	41.29	A
12	26-02-2013	40.97	A
13	27-02-2013	41.73	A
14	28-02-2013	41.48	A
15	01-03-2013	41.93	A

ANALYSIS IN POWER QUERY

Adding an Index column (Add column → Index Column → From 0)

	1.2 close	A ^B _C Name	1 ² ₃ Index	1.2 SMA 10	1.2 EMA 10
08-02-2013	45.08	A	0	null	null
11-02-2013	44.6	A	1	null	null
12-02-2013	44.62	A	2	null	null
13-02-2013	44.75	A	3	null	null
14-02-2013	44.58	A	4	null	null
15-02-2013	42.25	A	5	null	null
19-02-2013	43.01	A	6	null	null
20-02-2013	42.24	A	7	null	null
21-02-2013	41.63	A	8	null	null
22-02-2013	41.8	A	9	43.456	43.456
25-02-2013	41.29	A	10	43.077	43.06218182
26-02-2013	40.97	A	11	42.714	42.68178512
27-02-2013	41.73	A	12	42.425	42.50873328
28-02-2013	41.48	A	13	42.098	42.32169087
01-03-2013	41.93	A	14	41.833	42.25047435
04-03-2013	42.03	A	15	41.811	42.2103881
05-03-2013	42.66	A	16	41.776	42.29213572

ANALYSIS IN EXCEL

SMA 10 – Simple Moving Avg of last 10 days

EMA 10- Exponential Moving Avg of last 10 days

Initial SMA: 10-period sum / 10

Multiplier: $(2 / (\text{Time periods} + 1)) = (2 / (10 + 1)) = 0.1818$ (18.18%)

EMA: $\{\text{Close} - \text{EMA}(\text{previous day})\} \times \text{multiplier} + \text{EMA}(\text{previous day})$.

fx		=AVERAGE(E2:E11)									
	D	E	F	G	H	I	J				
	low	close	volume	Name	SMA 10	EMA 10					
5.35	45	45.08	1824755	A							
5.18	44.45	44.6	2915405	A							
4.95	44.5	44.62	2373731	A							
5.24	44.68	44.75	2052338	A							
4.78	44.36	44.58	3826245	A							
4.24	42.21	42.25	14657315	A							
3.12	42.21	43.01	4116141	A							
2.85	42.225	42.24	3873183	A							
2.14	41.47	41.63	3415149	A							
2.07	41.58	41.8	3354862	A							
2.22	41.29	41.29	3622460	A							
1.29	40.19	40.97	6185811	A							

fx		=I11+(2/11)*(E12-I11)									
	D	E	F	G	H	I	J				
	low	close	volume	Name	SMA 10	EMA 10					
5.35	45	45.08	1824755	A							
5.18	44.45	44.6	2915405	A							
4.95	44.5	44.62	2373731	A							
5.24	44.68	44.75	2052338	A							
4.78	44.36	44.58	3826245	A							
4.24	42.21	42.25	14657315	A							
3.12	42.21	43.01	4116141	A							
2.85	42.225	42.24	3873183	A							
2.14	41.47	41.63	3415149	A							
2.07	41.58	41.8	3354862	A							
2.22	41.29	41.29	3622460	A							

ANALYSIS IN POWER QUERY

SMA 10 – Simple Moving Avg of last 10 days

EMA 10- Exponential Moving Avg of last 10 days

Custom Column

Add a column that is computed from the other columns.

New column name

EMA 10

Custom column formula ⓘ

```
= if [Index]>=9 then List.Average(List.Range(#"Added Index"
[close],[Index]-9,10)) else null
```

close	Name	Index	SMA 10	EMA 10
45.08	A	0	null	null
44.6	A	1	null	null
44.62	A	2	null	null
44.75	A	3	null	null
44.58	A	4	null	null
42.25	A	5	null	null
43.01	A	6	null	null
42.24	A	7	null	null
41.63	A	8	null	null
41.8	A	9	43.456	43.456
41.29	A	10	43.077	43.06218182
40.97	A	11	42.714	42.68178512
41.73	A	12	42.425	42.50873328
41.48	A	13	42.098	42.32169087

ANALYSIS IN POWER QUERY

EMA 10- Exponential Moving Avg of last 10 days

Initial SMA: 10-period sum / 10

Multiplier: $(2 / (\text{Time periods} + 1)) = (2 / (10 + 1)) = 0.1818$ (18.18%)

EMA: $\{\text{Close} - \text{EMA}(\text{previous day})\} \times \text{multiplier} + \text{EMA}(\text{previous day})$.

```
#"Added Custom" = Table.AddColumn("#Added Index", "SMA 10", each if [Index]>=9 then List.Average(List.Range("#Added Index"[close],[Index]-9,10)) else null),
#"Added Custom1" = Table.AddColumn("#Added Custom", "EMA 10", each if [Index]>=9 then
let
start=List.First(List.RemoveNulls("#Added Custom"[SMA 10])),
vlist=List.Range(Table.Column("#Added Custom", "close"),10,[Index]-9),acc=List.Accumulate(vlist,start,(state,current)=>(current-state)*(2/11)+state)
in
if [Index]=9 then start else acc
else null),
#"Changed Type1" = Table.TransformColumnTypes("#Added Custom1",{{"SMA 10", type number}, {"EMA 10", type number}}),
```

EMA 10- Exponential Moving Avg of last 10 days

```
#"Added Custom" = Table.AddColumn("#Added Index", "SMA 10", each if [Index]>=9 then List.Average(List.Range("#Added Index"[close],[Index]-9,10)) else null),
#"Added Custom1" = Table.AddColumn("#Added Custom", "EMA 10", each if [Index]>=9 then
let
start=List.First(List.RemoveNulls("#Added Custom"[SMA 10])),
vlist=List.Range(Table.Column("#Added Custom","close"),10,[Index]-9),acc=List.Accumulate(vlist,start,(state,current)=>(current-state)*(2/11)+state)
in
if [Index]=9 then start else acc
else null),
#"Changed Type1" = Table.TransformColumnTypes("#Added Custom1",{{"SMA 10", type number}, {"EMA 10", type number}}),
```

Index = 9 : EMA10 = SMA10 = **43.456**

Index =10 :

vlist = {41.29}

start = 43.456, current = 41.29 , next state= $(2/11)(41.29-43.456)+43.456 = \mathbf{43.062}$

Index= 11 :

vlist = {41.29,40.97}

start=43.456 (first SMA10) , current =41.29 , next state= 43.062

state=43.062 , current = 40.97 , next state = **42.681**

RSI CALCULATION

ANALYSIS IN POWER QUERY

Calculating average gain and loss in Close Price for last 14 days

	Prev close	1.2 change	ABC 123 gain	1.2 loss	ABC 123 avg gain	ABC 123 avg loss
1	null	null	null	null	null	null
2	45.08	-0.48	0	0.48	null	null
3	44.6	0.02	0.02	0	null	null
4	44.62	0.13	0.13	0	null	null
5	44.75	-0.17	0	0.17	null	null
6	44.58	-2.33	0	2.33	null	null
7	42.25	0.76	0.76	0	null	null
8	43.01	-0.77	0	0.77	null	null
9	42.24	-0.61	0	0.61	null	null
10	41.63	0.17	0.17	0	null	null
11	41.8	-0.51	0	0.51	null	null
12	41.29	-0.32	0	0.32	null	null
13	40.97	0.76	0.76	0	null	null
14	41.73	-0.25	0	0.25	null	null
15	41.48	0.45	0.45	0	0.163571429	0.388571429
16	41.93	0.1	0.1	0	0.170714286	0.354285714
17	42.03	0.63	0.63	0	0.214285714	0.354285714
18	42.66	0.58	0.58	0	0.246428571	0.354285714

ANALYSIS IN POWER QUERY

Calculating average gain and loss in Close Price for last 14 days

```
#"Changed Type1" = Table.TransformColumnTypes(#"Added Custom1",{{"SMA 10", type number}, {"EMA 10", type number}}),
#"Added Custom2" = Table.AddColumn(#"Changed Type1", "Prev close", each try #"Changed Type1" {[Index]-1}[close] otherwise null),
#"Inserted Subtraction" = Table.AddColumn(#"Added Custom2", "Subtraction", each [close] - [Prev close], type number),
#"Renamed Columns" = Table.RenameColumns(#"Inserted Subtraction",{{"Subtraction", "change"}}),
#"Added Conditional Column" = Table.AddColumn(#"Renamed Columns", "gain", each if [change] > 0 then [change] else 0),
#"Replaced Errors" = Table.ReplaceErrorValues(#"Added Conditional Column", {{"gain", null}}),
#"Added Conditional Column1" = Table.AddColumn(#"Replaced Errors", "loss", each if [change] < 0 then [change] else 0),
#"Replaced Errors1" = Table.ReplaceErrorValues(#"Added Conditional Column1", {{"loss", null}}),
#"Calculated Absolute Value" = Table.TransformColumns(#"Replaced Errors1",{{"loss", Number.Abs, type number}}),
#"Added Custom1_" = Table.AddColumn(#"Calculated Absolute Value", "avg gain", each if [Index] >= 14
then List.Average(List.Range(#"Calculated Absolute Value"[gain],[Index] - 13, 14)) else null),
#"Added Custom2_" = Table.AddColumn(#"Added Custom1_", "avg loss", each if [Index] >= 14
then List.Average(List.Range(#"Calculated Absolute Value"[loss],[Index] - 13, 14)) else null),
```

ANALYSIS IN POWER QUERY

Calculating RS and RSI

$$RS = \frac{Avg.Gain}{Avg.Loss}$$

$$RSI = 100 - \frac{100}{1 + RS}$$

		ABC 123 avg gain	ABC 123 avg loss	1.2 RS	1.2 RSI
9	1	null	null	null	null
10	0	null	null	null	null
11	1	null	null	null	null
12	2	null	null	null	null
13	0	null	null	null	null
14	5	null	null	null	null
15	0	0.163571429	0.388571429	0.420955882	29.62483829
16	0	0.170714286	0.354285714	0.481854839	32.5170068
17	0	0.214285714	0.354285714	0.60483871	37.68844221
18	0	0.246428571	0.354285714	0.695564516	41.02259215
19	0	0.247142857	0.342142857	0.722338205	41.93939394
20	2	0.247142857	0.191428571	1.291044776	56.35179153
21	2	0.192857143	0.207142857	0.931034483	48.21428571
22	9	0.192857143	0.165714286	1.163793103	53.78486056

ANALYSIS IN POWER QUERY

Calculating RS and RSI

$$RS = \frac{Avg.Gain}{Avg.Loss}$$
$$RSI = 100 - \frac{100}{1 + RS}$$

```
#"Inserted Division" = Table.AddColumn("#Added Custom2_", "Division", each [avg gain] / [avg loss], type number),  
#"Renamed Columns1" = Table.RenameColumns("#Inserted Division",{{"Division", "RS"}}),  
#"Added Custom3" = Table.AddColumn("#Renamed Columns1", "RSI", each if [avg loss]=0 then 0 else (100-(100/(1+[RS]))),type number),
```


ANALYSIS IN POWER QUERY

Calculating Daily % change and Buy/Sell signals for EMA

Percentage Change = ((Current Value - Previous Value) / Previous Value) * 100

ABC 123	Daily % change	ABC 123	buy/sell 1	ABC 123	Prev buy/sell 1	1.2	Sell signal EMA	1.2	Buy signal EMA
	-1.444128788		null		null		null		null
	0.408359356		-1		null		null		null
	-1.220095694		-1		-1		null		null
	-0.775006055		-1		-1		null		null
	1.855015865		-1		-1		null		null
	-0.599089384		-1		-1		null		null
	1.084860174		-1		-1		null		null
	0.238492726		-1		-1		null		null
	1.498929336		1		-1		null		42.66
	1.359587436		1		1		null		null
	0.023126735		1		1		null		null
	-0.50867052		1		1		null		null
	-0.511271206		1		1		null		null
	-0.443821537		-1		1		42.62		null
	0.891600188		1		-1		null		43
	0.744186047		1		1		null		null

Close price goes above EMA-
Buy

Close price goes below EMA-
Sell

ANALYSIS IN POWER QUERY

Calculating Daily % change and Buy/Sell signals for EMA

```
#"Added Custom4" = Table.AddColumn(#"Added Custom3", "Daily % change", each ([change]/[Prev close])*100),
#"Added Conditional Column2" = Table.AddColumn(#"Added Custom4", "buy/sell 1", each if [close] > [EMA 10] then 1 else -1),
#"Replaced Errors2" = Table.ReplaceErrorValues(#"Added Conditional Column2", {"buy/sell 1", null}),
#"Added Custom5" = Table.AddColumn(#"Replaced Errors2", "Prev buy/sell 1", each try #"Replaced Errors2"{[Index]-1}[#buy/sell 1] otherwise null),
#"Added Conditional Column3" = Table.AddColumn(#"Added Custom5", "Sell signal",
each if ([#buy/sell 1] <> [#Prev buy/sell 1] and [#buy/sell 1]=-1) and [#Prev buy/sell 1]<>null then [close] else null,type number),
#"Added Custom6" = Table.AddColumn(#"Added Conditional Column3", "Buy signal",
each if ([#buy/sell 1] <> [#Prev buy/sell 1] and [#buy/sell 1]=1) and [#Prev buy/sell 1]<>null then [close] else null,type number),
#"Renamed Columns2" = Table.RenameColumns(#"Added Custom6",{"Sell signal", "Sell signal EMA"}, {"Buy signal", "Buy signal EMA"})
```

Close price goes above EMA- Buy

Close price goes below EMA- **Sell**



ANALYSIS IN POWER QUERY

Append data for all 14 stocks in 1 sheet (Home – Append Queries as New)

Final sheet with all stocks- all stocks (will do visualization using this sheet)

Back to Power Bi (close& apply)

VISUALIZATION



VISUALIZATION

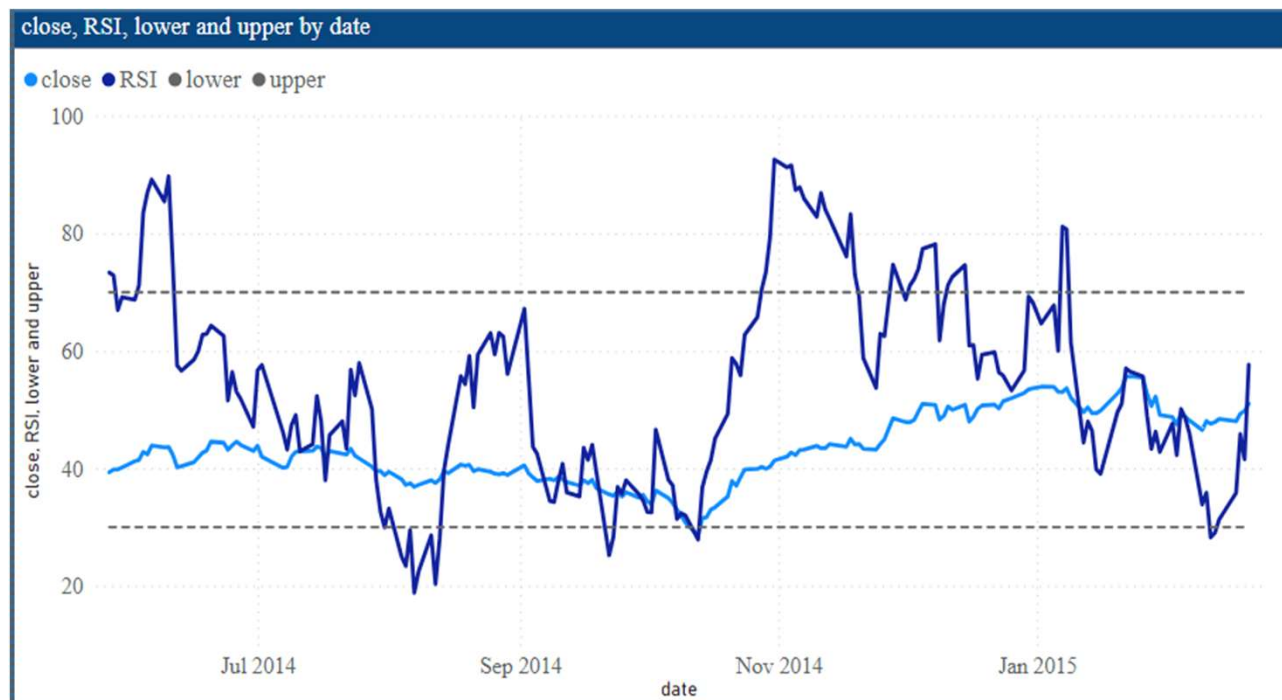


RSI below 30 – **Buy Signal**

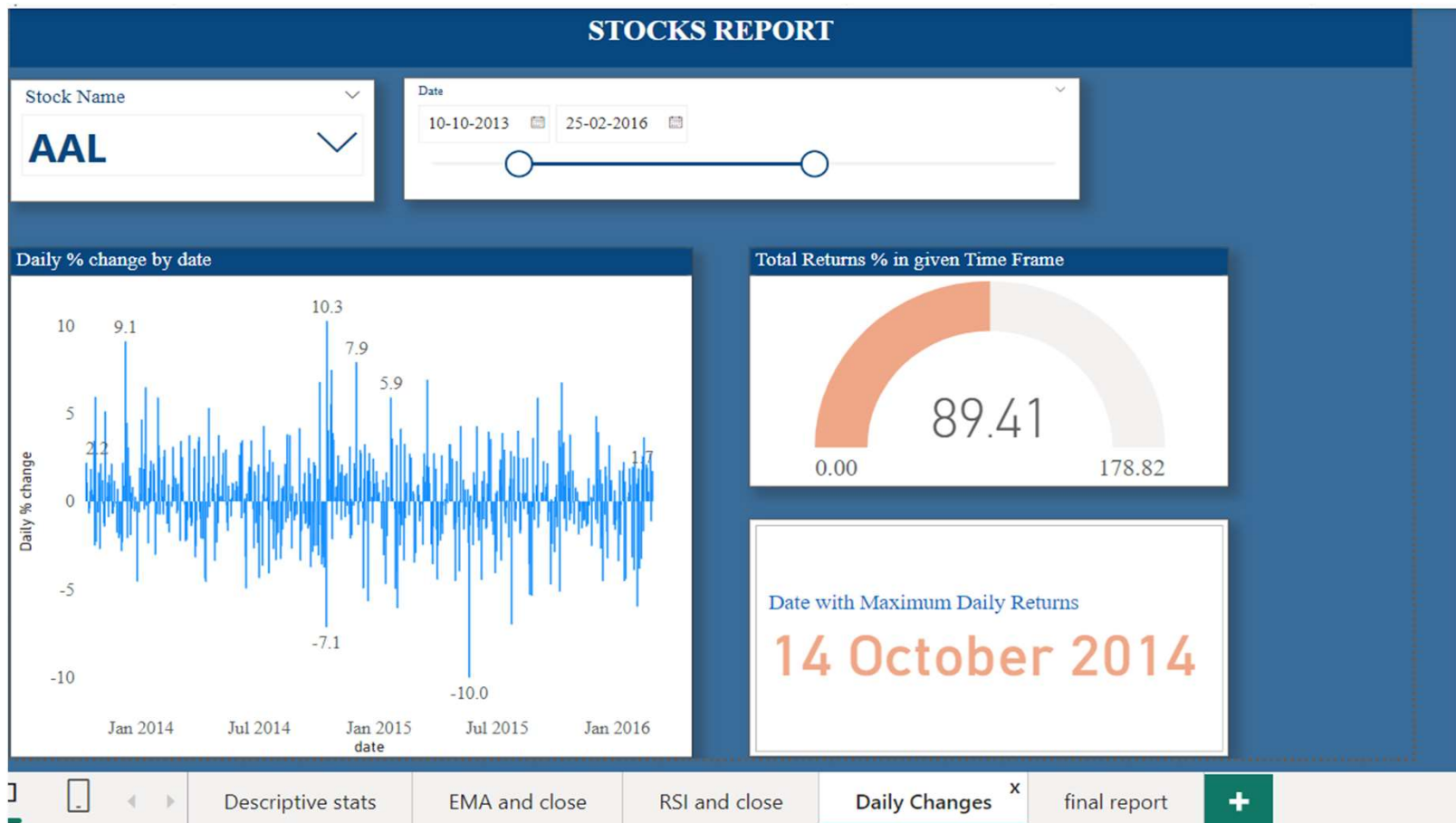
(indicates oversold or undervalued condition)

RSI above 70 – **Sell Signal**

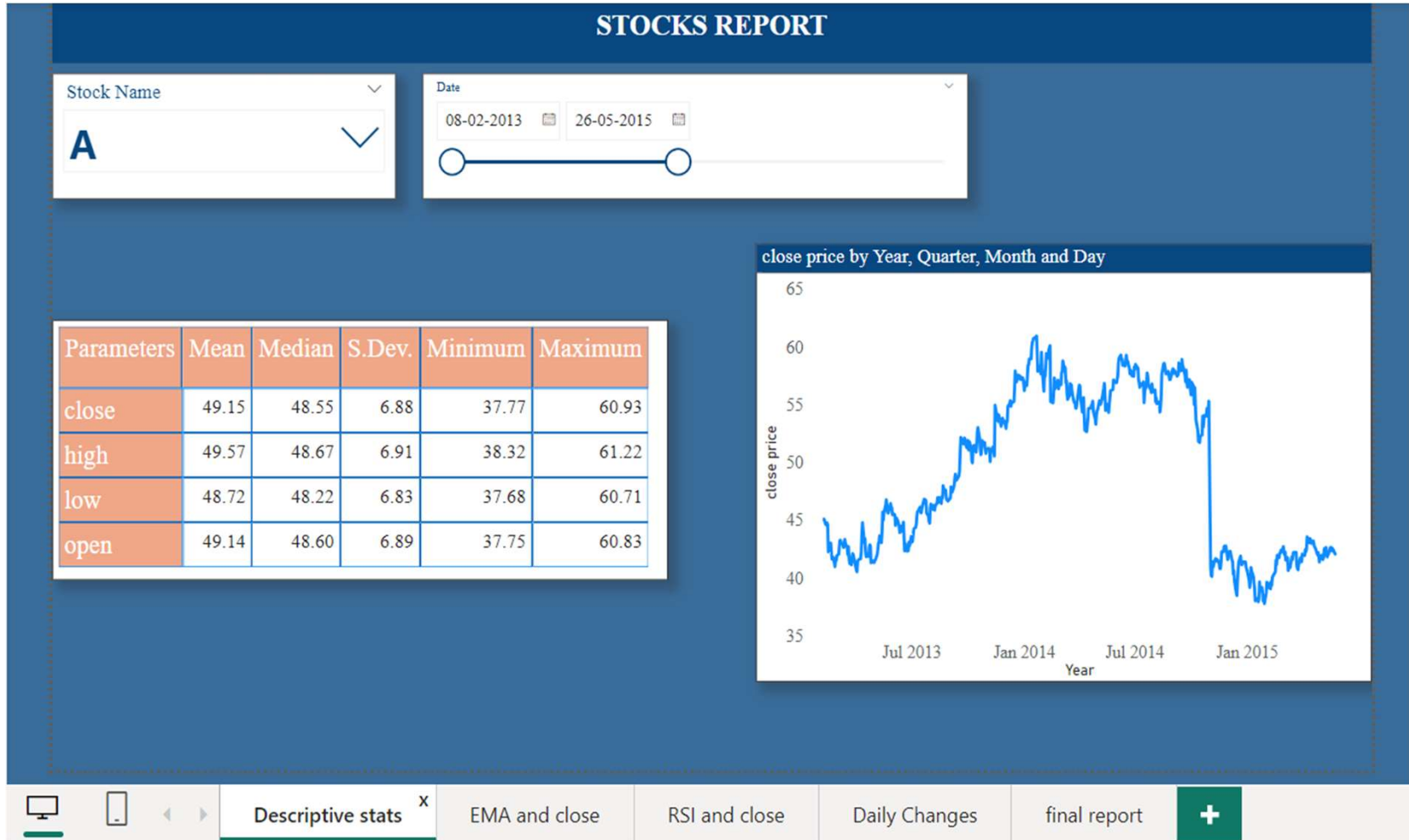
(indicates overbought or overvalued condition)



VISUALIZATION



DESCRIPTIVE STATS



DESCRIPTIVE STATS

In a new sheet , **unpivot columns** (open , close, low, high)

Group By

Use First Row as Headers

Count Rows

Table

Transpose

Reverse Rows

Count Rows

Data Type: Date

Replace Values

Unpivot Columns

Detect Data Type

Fill

Move

Rename

Pivot Column

Convert to List

Any Column

Split Column

Format

Extract

Parse

Text Column

Statistics

Standard

Scientific

Trigonometry

Rounding

Information

Number Column

Date

Time

Duration

Date & Time Column

Run R script

Run Python script

Scripts

Queries [16]

A

AAL

AAP

AAPL

ADBE

CHK

CHRW

CINF

CHTR

CL

CLX

CMA

CMCSA

CME

all stocks

original sheet

fx

= Table.AddColumn(#"Renamed Columns", "Merged DN", each Text.Combine({Text.From([date], "en-IN"),

1.23 volume

AB Name

AB Parameters

1.2 Value

AB M

1	08-02-2013	1824755	A	open	45.07	08-
2	08-02-2013	1824755	A	high	45.35	08-
3	08-02-2013	1824755	A	low	45	08-
4	08-02-2013	1824755	A	close	45.08	08-
5	11-02-2013	2915405	A	open	45.17	11-
6	11-02-2013	2915405	A	high	45.18	11-
7	11-02-2013	2915405	A	low	44.45	11-
8	11-02-2013	2915405	A	close	44.6	11-
9	12-02-2013	2373731	A	open	44.81	12-
10	12-02-2013	2373731	A	high	44.95	12-
11	12-02-2013	2373731	A	low	44.5	12-
12	12-02-2013	2373731	A	close	44.62	12-
13	13-02-2013	2052338	A	open	44.81	13-
14	13-02-2013	2052338	A	high	45.24	13-
15	13-02-2013	2052338	A	low	44.68	13-
16	13-02-2013	2052338	A	close	44.75	13-
17	14-02-2013	3826245	A	open	44.72	14-
18	14-02-2013	3826245	A	high	44.78	14-

Query Settings

PROPERTIES

Name

original sheet

All Properties

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Unpivoted Only Selected Colu...

Renamed Columns

Inserted Merged Column

DESCRIPTIVE STATS

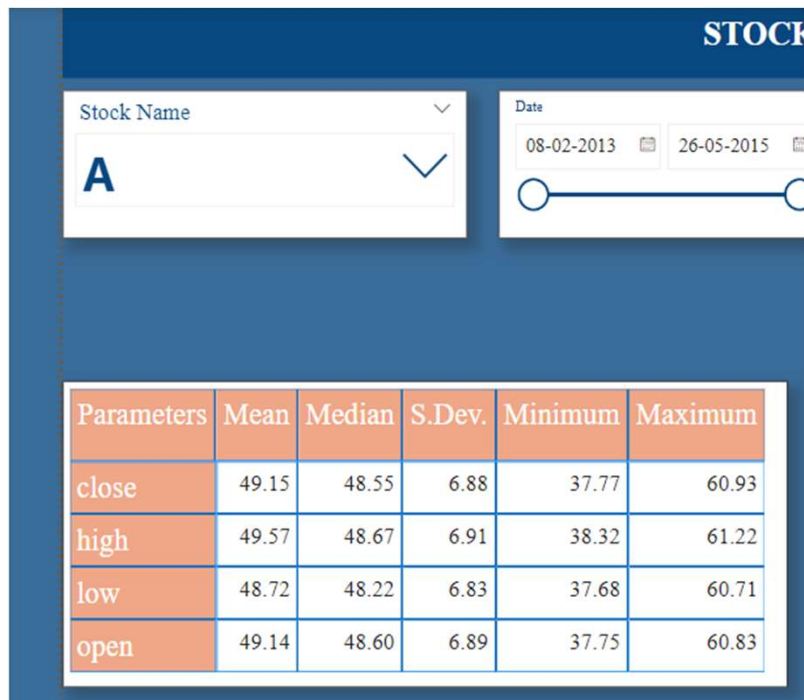
Add a **matrix** , (in slicer only one stock selected)

Rows – parameters

Values – mean of value

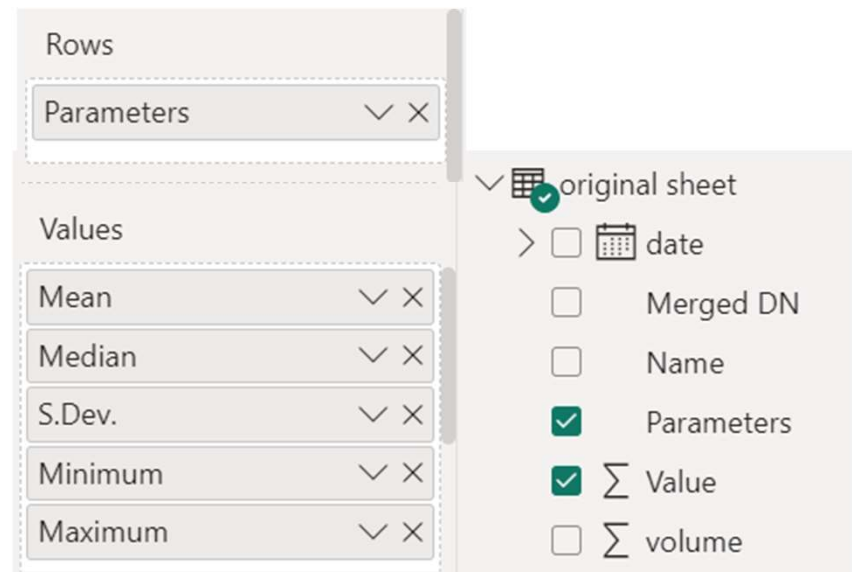
median of value

S.Dev of value etc.



The screenshot shows a Power BI dashboard with a dark blue header labeled 'STOCK'. Below the header, there are two slicers: 'Stock Name' with a dropdown menu showing 'A' and 'Date' with a date range from '08-02-2013' to '26-05-2015'. Below the slicers is a matrix table with the following data:

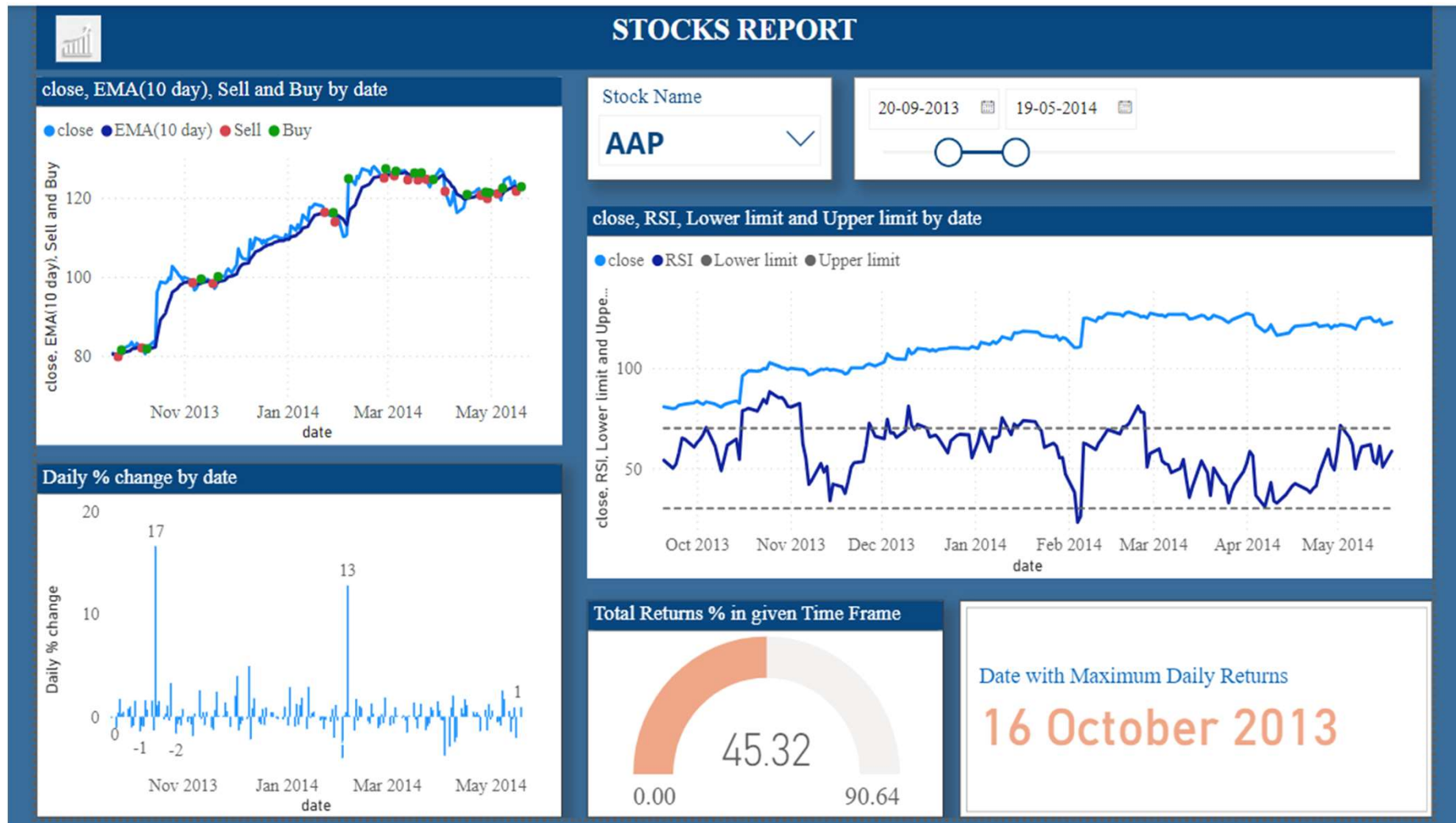
Parameters	Mean	Median	S.Dev.	Minimum	Maximum
close	49.15	48.55	6.88	37.77	60.93
high	49.57	48.67	6.91	38.32	61.22
low	48.72	48.22	6.83	37.68	60.71
open	49.14	48.60	6.89	37.75	60.83



The configuration pane shows the following settings:

- Rows:** Parameters
- Values:** Mean, Median, S.Dev., Minimum, Maximum
- Columns:** original sheet
- Filters:** date, Merged DN, Name, Parameters, Value, volume

FINAL REPORT



THANK YOU