AASSIGNMENT 1

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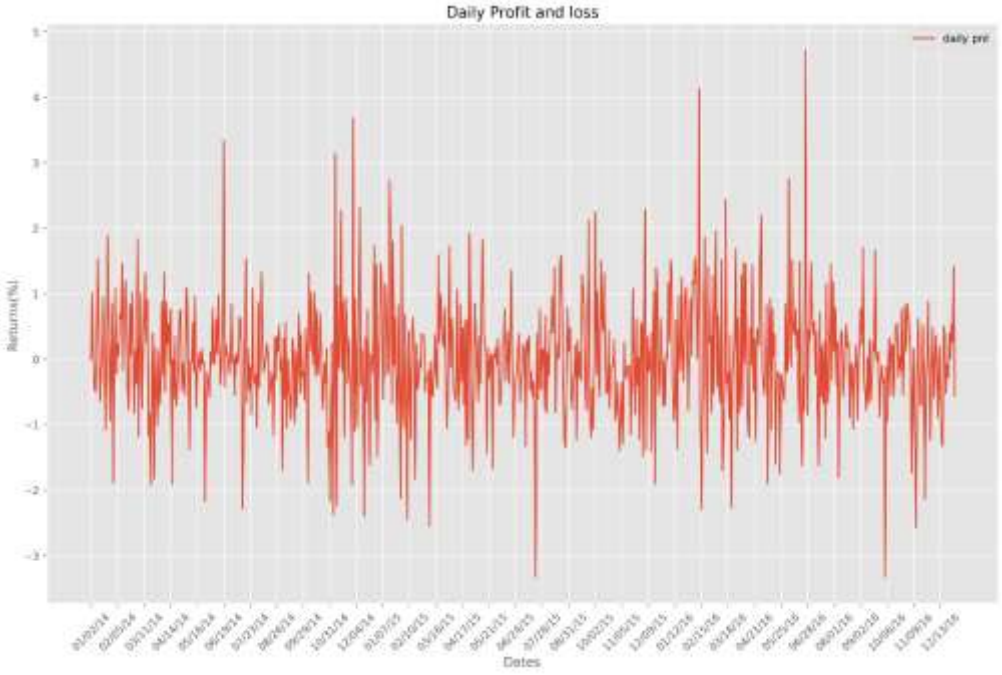
With given daily prices of exchange-rate, the price movement over the period of 2014 to 2016 is given below.

The daily Profit and loss of the price is



1)ANNUALIZED VOLATILITY OF DAILY RETURN

The volatility gives risk factor (extreme return movement) of the trading strategies. According to volatility,

Top performing strategies are:

1. 03_09
2. 03_12
3. 03_11
4. 03_05
5. 03_06

Strategies	Volatility(%)
03_09	0.33
03_12	0.34
03_11	0.34
03_05	0.34
03_06	0.34

Worst performing are:

1. 01_03
2. 01_05
3. 01_07
4. 01_08
5. 01_02

Strategies	Volatility(%)
01_04	0.39
01_07	0.39
01_08	0.39
01_03	0.40
01_05	0.40

2) INFORMATION RATIO

This is a measurement that gives comparative returns beyond benchmark return and with respect to volatility of returns. According to Information ratio calculated for the given returns of strategies, top 5 strategies are given in the figure. Since we are not benchmarking to anything benchmark return is zero.

$$\text{IR} = \frac{\text{Portfolio Return} - \text{Benchmark Return}}{\text{Tracking Error}}$$

	Info Ratio
03_12	0.066
03_04	0.065
01_12	0.064
03_11	0.063
03_06	0.063

Where,

IR= information ratio.

Benchmark return = return of the stock index,

Portfolio return = return of trading statergies,

Tracking Error = Stdev of difference between portfolio return and benchmark return.

3) SHARPE RATIO

This measurement is used to give investors the overall return compared to financing rate (risk-free rate) which is 0.738% as my refinancing rate from T-Bill for that period which I got from historical chart from Wall Street Journal.

According to Sharpe ratio, top 5 trading strategies are shown is in the figure:

	Sharpe Ratio
03_12	0.064
03_04	0.063
01_12	0.062
03_11	0.061
03_06	0.061

$$Sharpe\ Ratio = \frac{R_p - R_f}{\sigma_p}$$

where:

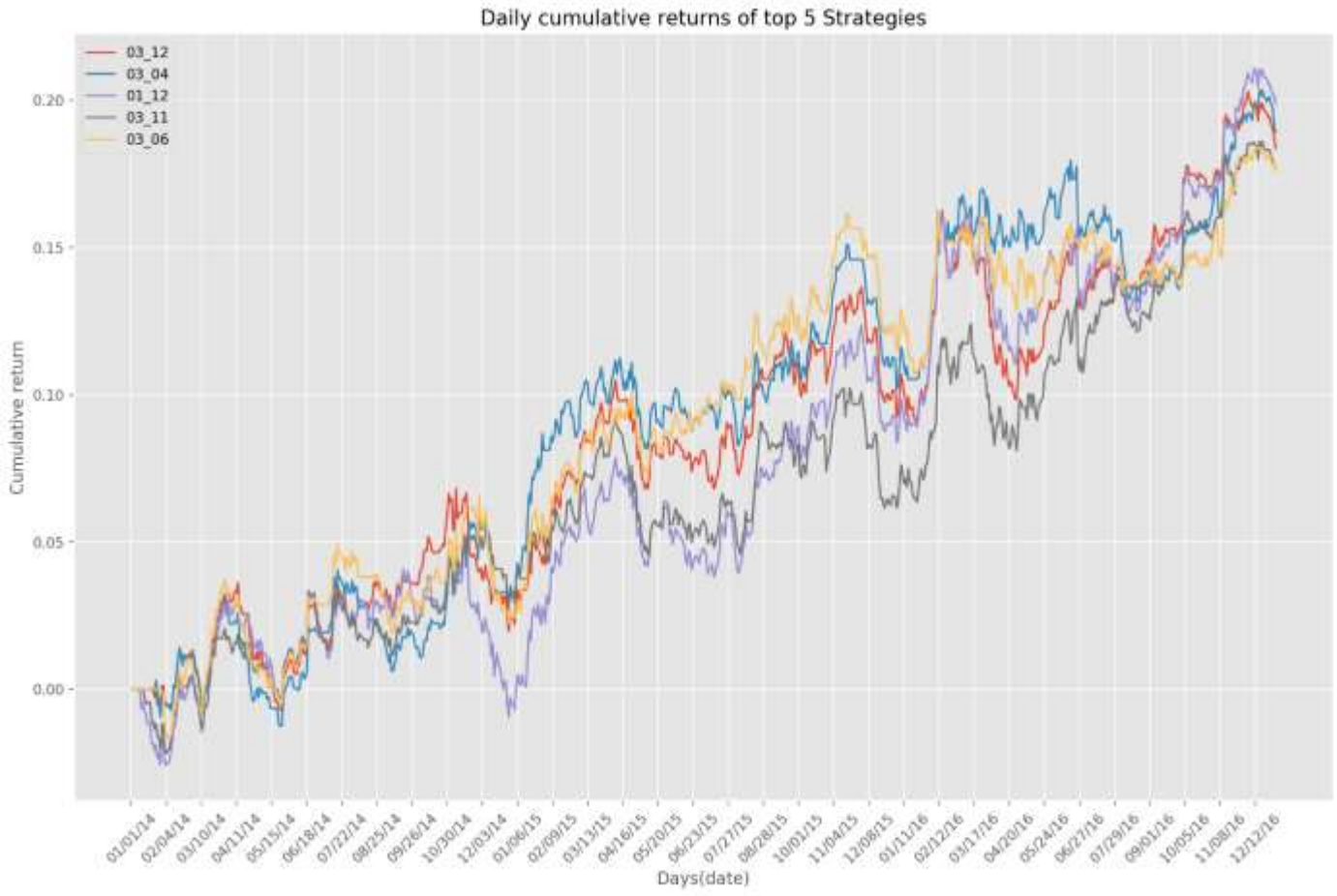
R_p = return of portfolio

R_f = risk-free rate

σ_p = standard deviation of the portfolio's excess return

4) CUMULATIVE RETURN

Cumulative return on an investment is the aggregate amount over the given duration (2014-2016). From the graph we can see the overall cumulative return for top 5 strategies.



- Final cumulative return:

Cumulative return

	03_12	03_04	01_12	03_11	03_06
782	0.18	0.19	0.2	0.18	0.18

5)YEARLY RETURN

Yearly return gauge the strategies, by one year. This useful to track the compare trading strategies over the years and tweak if its shortfalls expected return or when its not performing as compared previous years.

	Year_2014	Year_2015	Year_2016
03_12	0.0240	0.1012	0.1836
03_04	0.0330	0.1123	0.1892
01_12	-0.0049	0.0926	0.1987
03_11	0.0313	0.0654	0.1761
03_06	0.0243	0.1236	0.1760

6) %WINNERS AND %LOSERS

This stat gives the overall percentage of days a strategy has positive PnL. I Have taken Top 10 winners and losers because the values are repeating.

Strategies	# Of Winning days	%Winners
01_01	397	50.7%
01_03	397	50.7%
01_10	397	50.7%
01_04	396	50.57%
01_06	395	50.45%
01_05	395	50.45%
01_12	395	50.45%
01_02	392	50.06%
01_09	391	49.94%
01_11	391	49.94%

- Here, we can see strategies ***01_01, 01_03, 01, 01_10*** have the largest number of days (397) where it has positive return.

- Strategies ***03_09, 01_09*** are poor performing with 383 days of losing money.

Strategies	# of Losing days	%Losers
03_09	383	48.91%
01_09	383	48.91%
01_11	381	48.66%
01_08	378	48.28%
01_07	378	48.28%
01_02	378	48.28%
01_12	376	48.02%
01_10	376	48.02%
01_01	373	47.64%
01_04	372	47.51%

7) MAXIMUM DRAWDOWN

A maximum drawdown (MDD) is the maximum loss from a peak to a trough of a portfolio, before a new peak is attained.

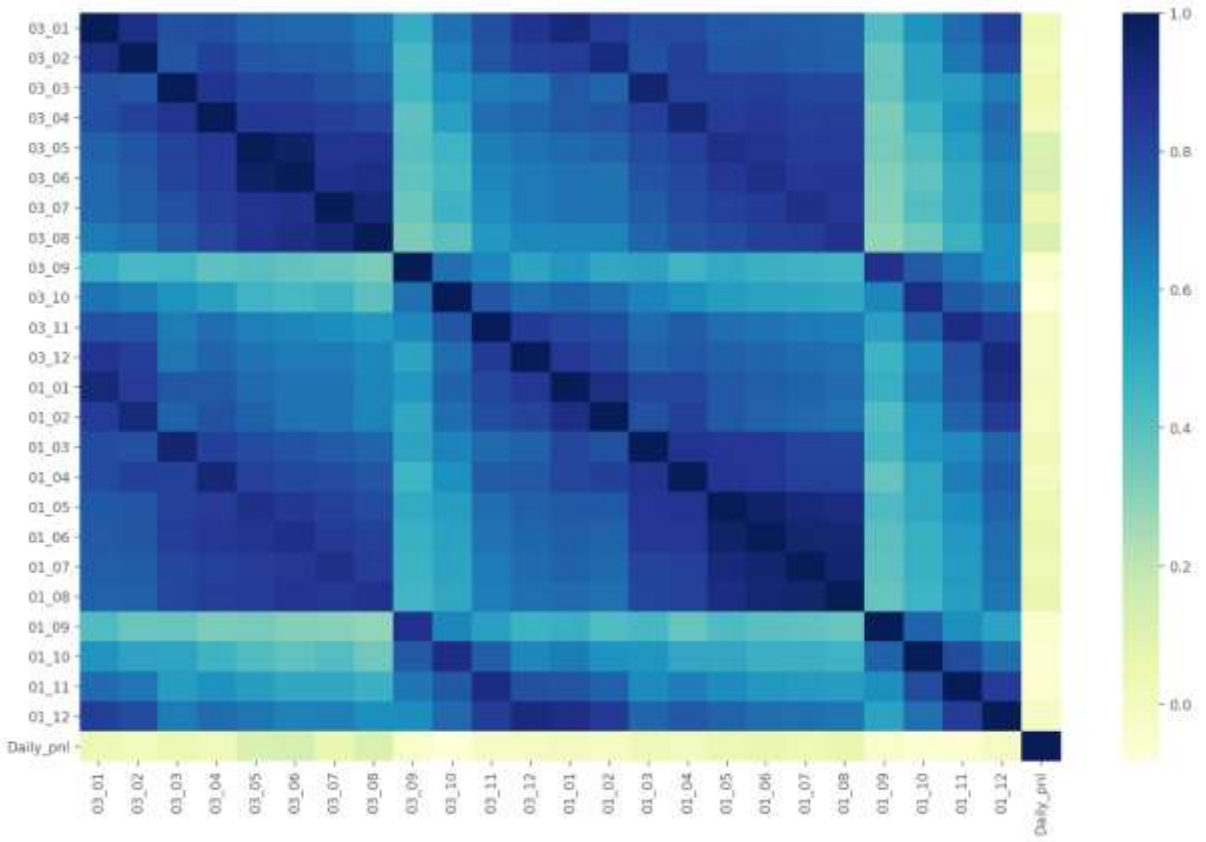
MDD = (Trough – Peak) / Peak.

Based on this calculation strategies with largest drawdown is

Strategies	MaxDD
03_08	2.02951
03_06	2.03567
03_07	2.03883
03_05	2.03911
03_09	2.4536

8) HEATMAP BETWEEN DIFFERRENT STRATEGIES AND DAILY PNL

Here I have used heatmap representation to show the correlation between different strategies and daily Pnl.



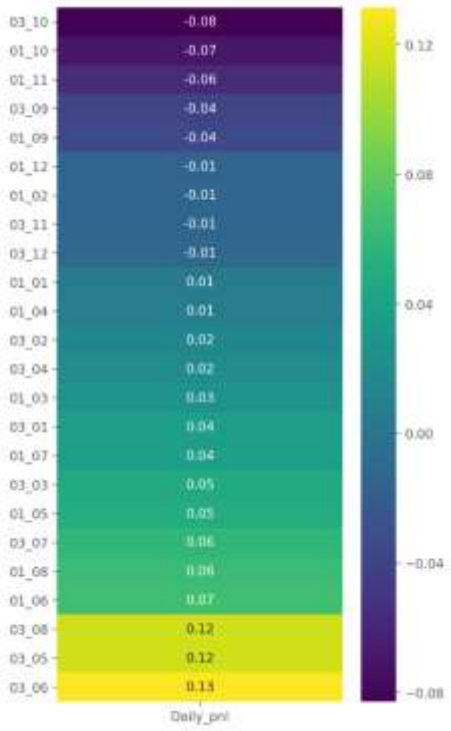
NOTE:
THE LEFTMOST COLOR BAR INDICATES CORRELATION BETWEEN VALUES FROM 0 TO 1 (WITH 0 = YELLOW AND 1 = BLUE)

This heatmap gives the correlation between daily profit and lose (%) and the returns made by the each strategies.

As you can see that strategies:

- 03_10
- 01_10
- 01_11
- 03_09
- 01_09

Have negative correlation.



CONCLUSION

Based on the performance metrics I discussed above top 5 trading strategies I will chose are:

1. 03_12
2. 03_04
3. 01_12
4. 03_11
5. 03_06