

Ma374-LAB 05

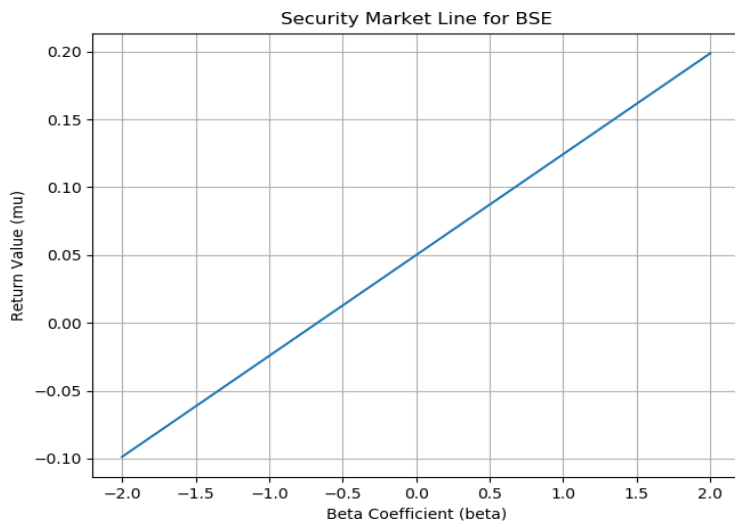
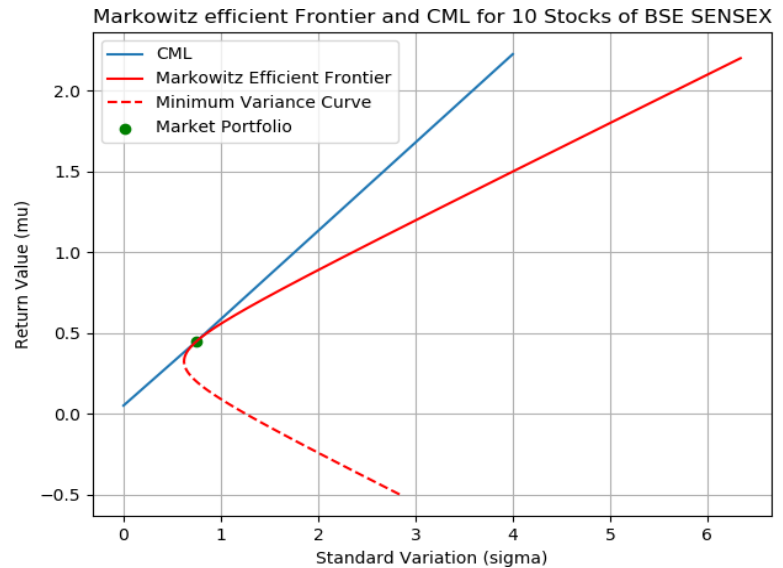
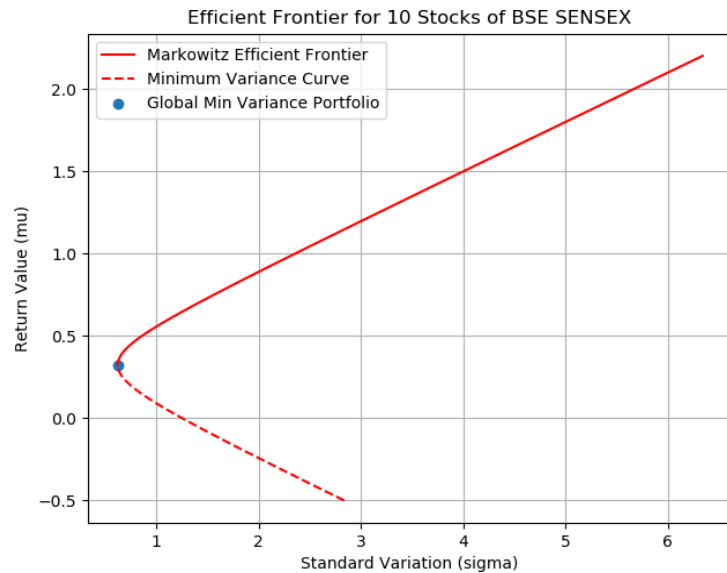
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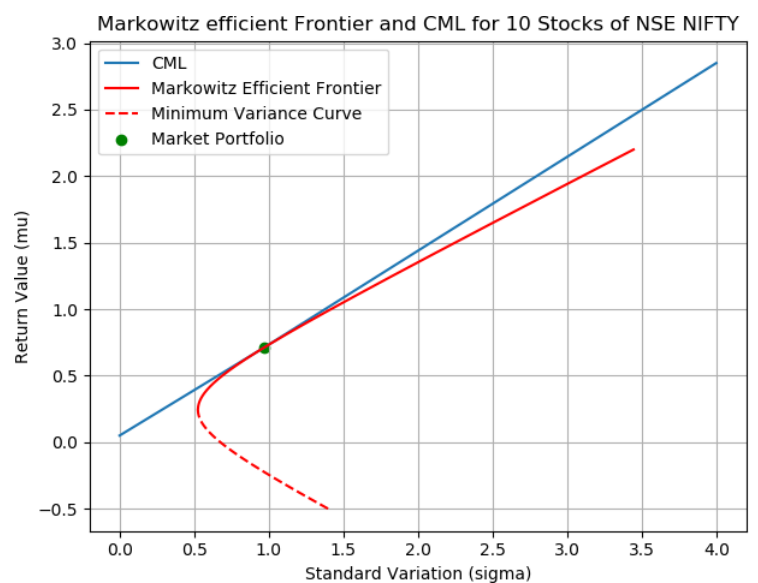
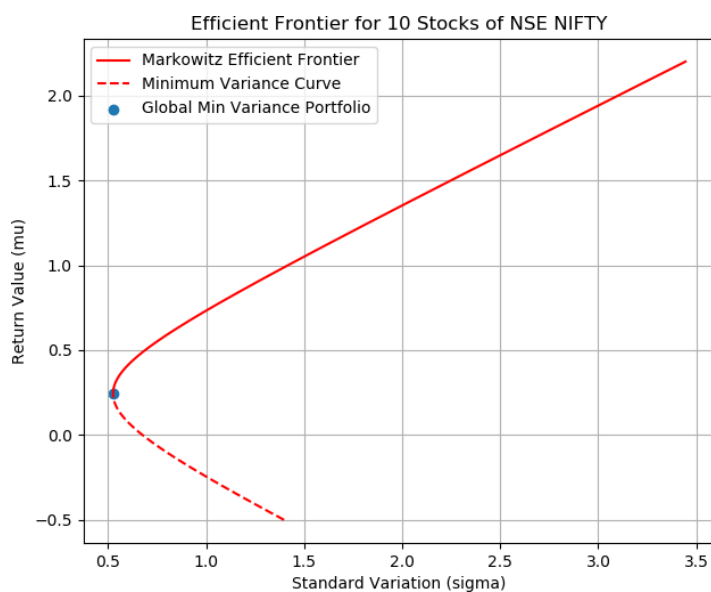
Question 1:

We have repeated q3 of lab 4 with the 10 stocks in BSE, NSE and 10 stocks listed in neither of them, the plots shown below represent the eff. frontiers and CML/SML for the particular cases. Risk free rate = 5%

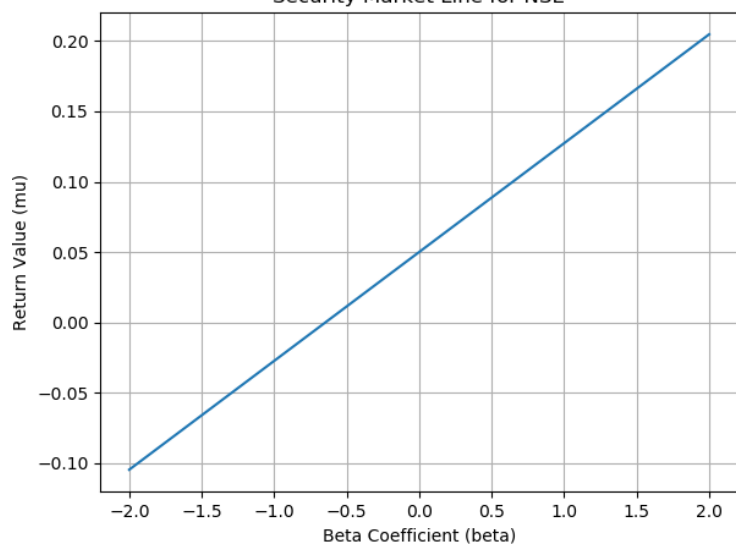
BSE stocks:



NSE stocks:

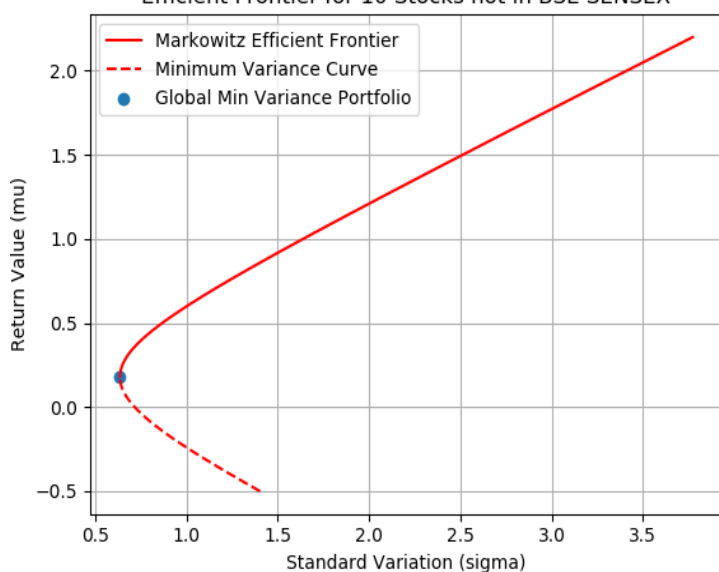


Security Market Line for NSE

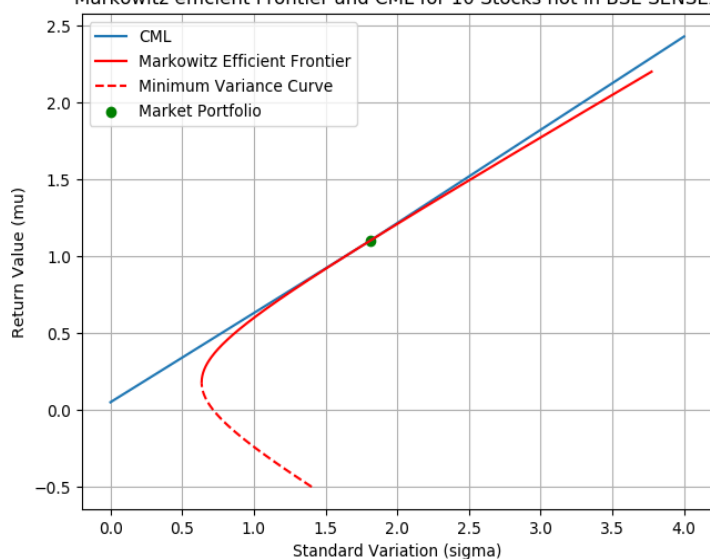


NON NSE/BSE stocks:

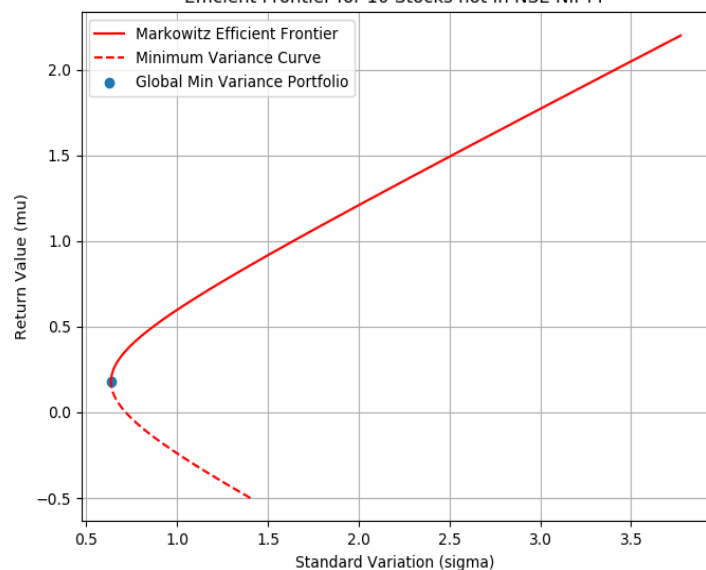
Efficient Frontier for 10 Stocks not in BSE SENSEX



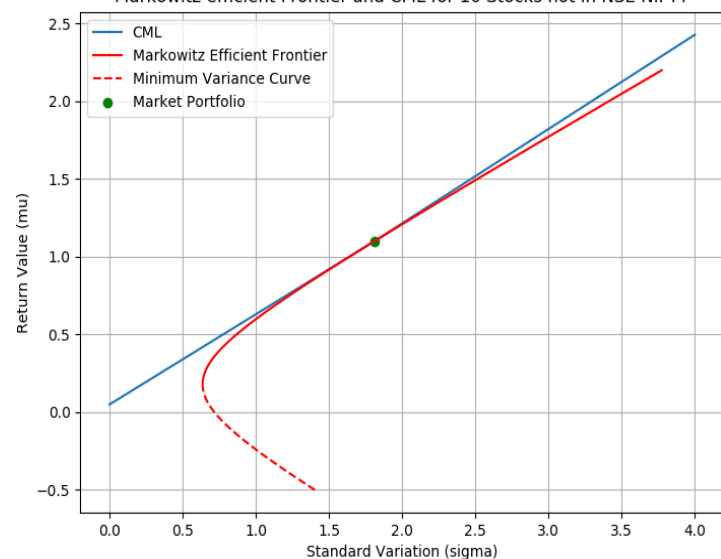
Markowitz efficient Frontier and CML for 10 Stocks not in BSE SENSEX



Efficient Frontier for 10 Stocks not in NSE NIFTY



Markowitz efficient Frontier and CML for 10 Stocks not in NSE NIFTY



Other essential information:

Expected return for NIFTY is: 0.1274085826169013

Variance for NIFTY is: 0.22001584461429835

Expected return for SENSEX is: 0.12437255087912862

Variance for SENSEX is: 0.21809497993913696

Considering 10 Stocks of BSE SENSEX

The risk-Free return = 0.05

The return on market portfolio is 0.4484

The risk on market portfolio is 0.7511 (75.1074 %)

Risk Free Rate: 0.05

Considering 10 Stocks of NSE NIFTY

The risk-Free return = 0.05

The return on market portfolio is 0.7128

The risk on market portfolio is 0.9703 (97.0343 %)

Risk Free Rate: 0.05

Considering 10 Stocks not included in BSE SENSEX

The risk-Free return = 0.05

The return on market portfolio is 1.101

The risk on market portfolio is 1.8116 (181.1558 %)

Risk Free Rate: 0.05

Considering 10 Stocks not included in NSE NIFTY

The risk-Free return = 0.05

The return on market portfolio is 1.101

The risk on market portfolio is 1.8116 (181.1558 %)

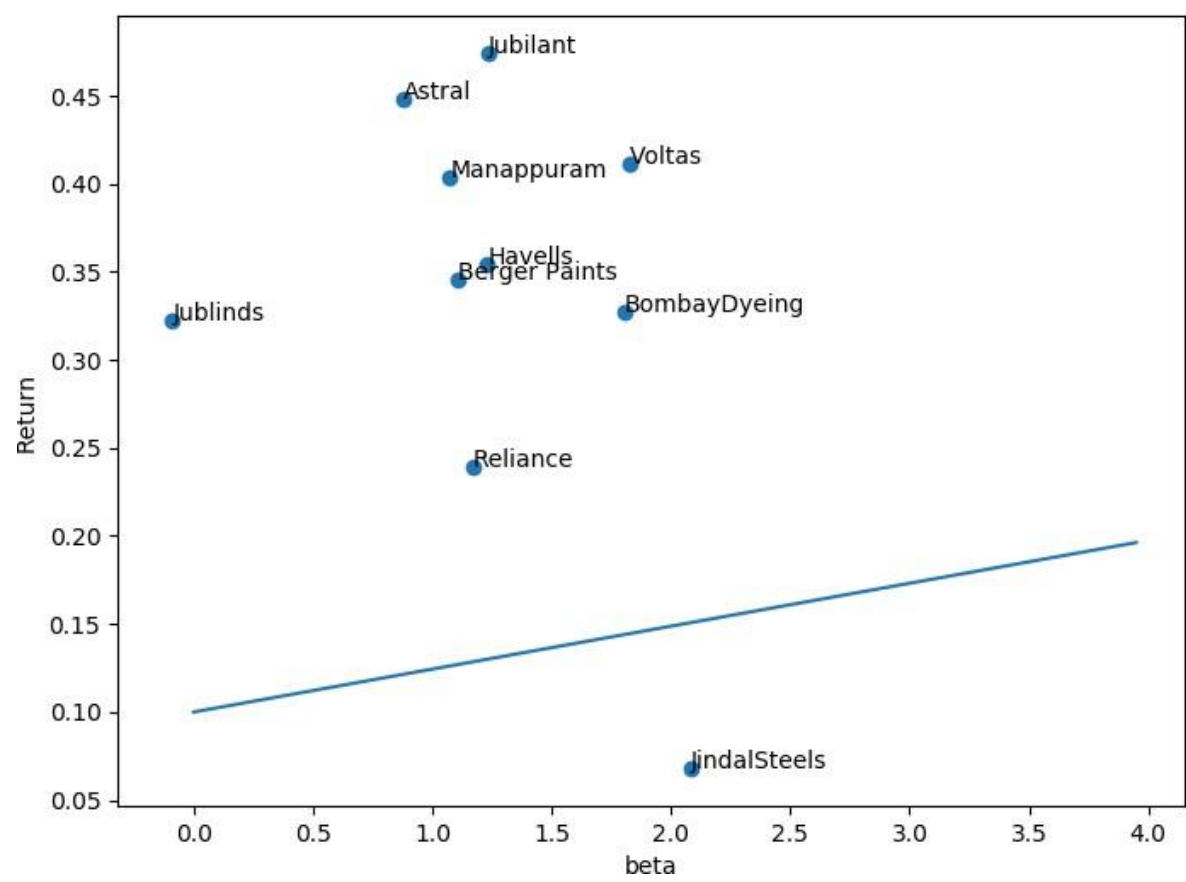
Risk Free Rate: 0.05

Question 2:

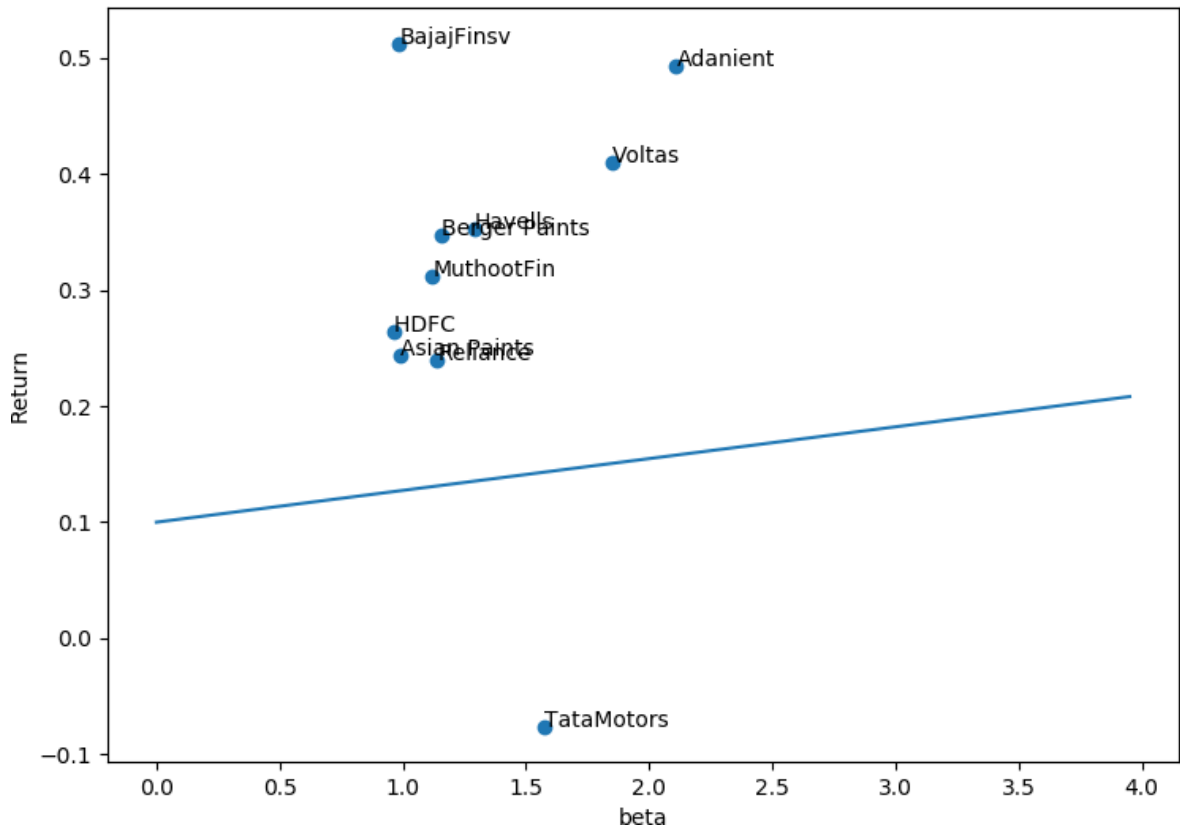
Plot for the returns/beta of stocks wrt to Security Market line for

NB. Risk free rate is considered to be 10% for this question

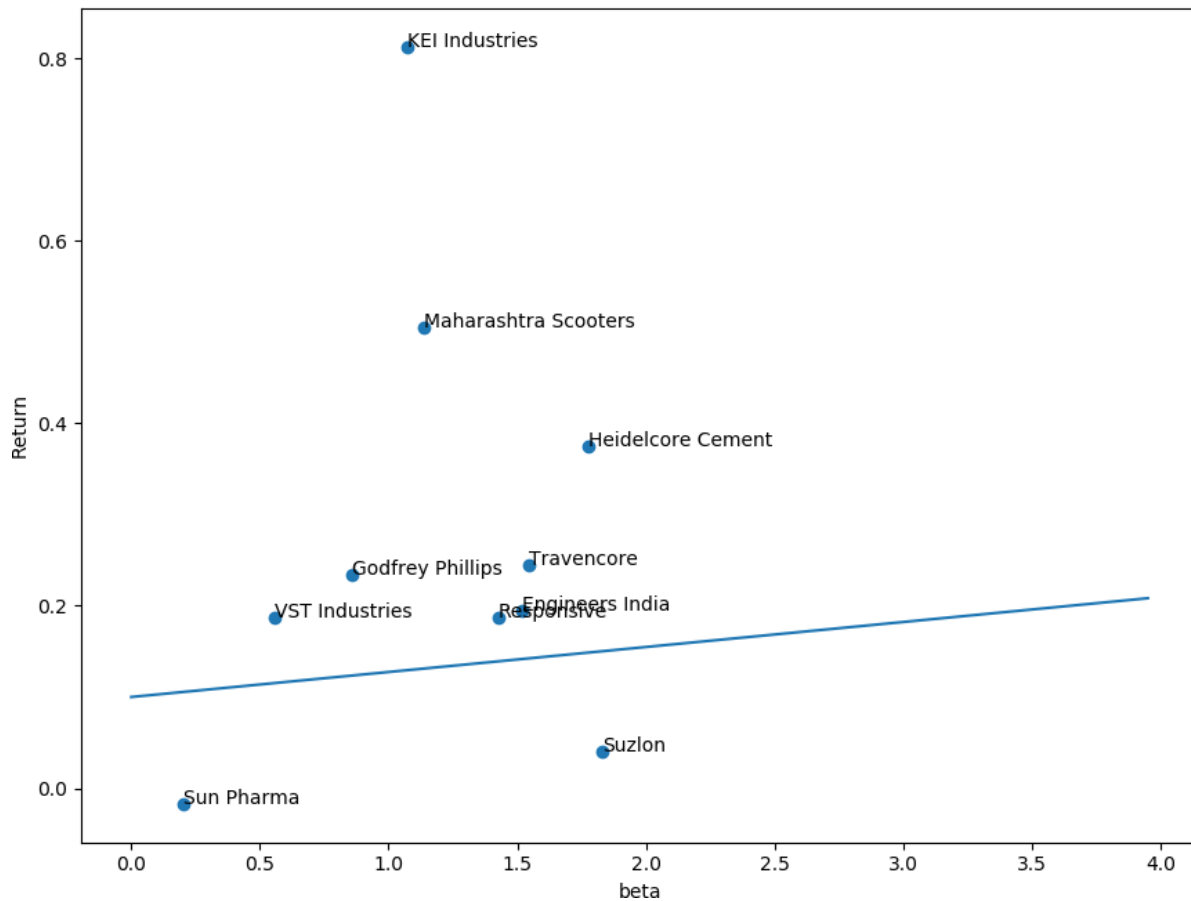
Case 1. BSE stocks (market portfolio is considered to be BSE)



Case 2. NSE stocks (market portfolio is considered to be NSE)



Case 3. Non-BSE\NSE stocks (market portfolio is considered to be NSE)



The stocks lying above the sml are undervalued as they provide higher returns for their systematic risks wrt to the security market line and the the ones lying below it are overvalued.

Based on this principle,

The list of Overvalued stocks is:

BSE: Jindal Steels; **NSE:** Tata Motors; **Non-BSE/NSE:** Suzlon, Sun Pharma

The rest of them are undervalued

Note: The return and beta of each stock was calculated and the tuple was plotted wrt to the sml to obtain the plots

The formula employed for calculating beta is:

$$\beta_i = \frac{\text{Cov}(r_i, r_m)}{\text{Var}(r_m)},$$

where r_i represents the return of the i th stock and r_m the return of the market.

Question 3:

The betas for the assets were calculated and compared to their respective long run betas obtained from various financial organizations, the formulas employed for the calculation of beta are discussed in q2

Case 1: BSE stocks, MARKET PORTFOLIO: BSE

<i>Stock name</i>	<i>Beta calculated using data</i>	<i>Beta obtained from sources</i>
ASTRAL	0.877	1.22
JINDALSTEELS	2.083	2.45
JUBLINDS	-0.089	1.61
VOLTAS	1.829	0.83
JUBILANT	1.235	0.72
HAVELLS	1.231	1.65
RELIANCE	1.168	1.08
BOMBAY DYEING	1.804	1.77
BERGER AINTS	1.109	1.13
MANAPPURAM	1.074	2.03

Case 2: NSE stocks, MARKET PORTFOLIO: NSE

<i>Stock name</i>	<i>Beta calculated using data</i>	<i>Beta obtained from sources</i>
HDFC	0.966	0.847
TATA MOTORS	1.574	1.97
ADANI ENT.	2.109	1.75
VOLTAS	1.847	0.83
BAJAJ FINSV	0.984	1.35
HAVELLS	1.292	1.65
RELIANCE	1.139	1.08
ASIAN PAINTS	0.988	0.77
BERGER PAINTS	1.154	1.13
MUTHOOD FINCORP.	1.119	1.1

Case 3: Non-NSE/BSE stocks, MARKET PORTFOLIO: NSE

<i>Stock name</i>	<i>Beta calculated using data</i>	<i>Beta obtained from sources</i>
SUZLON	1.828	1.28
GODFREY PHILLIPS	0.857	2.10
ENGINNERS INDIA	1.518	0.936
MAHARASHTRA SCOOTERS	1.138	1.55
KEI INDUSTRIES	1.072	1.3
SUN PHARMA	0.200	0.32
TRAVENCORE	1.546	1.73
RESPONSIVE	1.424	1.42
HEIDELCORE CEMENT	1.778	1.35
VST INDUSTRIES	0.555	0.65

Conclusion: The betas calculated theoretically have a good correlation with the official betas, however there are some grave differences in some of the results, which may be due to sampling methods (we have used monthly returns, however betas are calculated on a daily basis) amongst other things.

- **Note:** Please copy the csv data files and the executable files in the same folder for proper execution