

Assignment 5

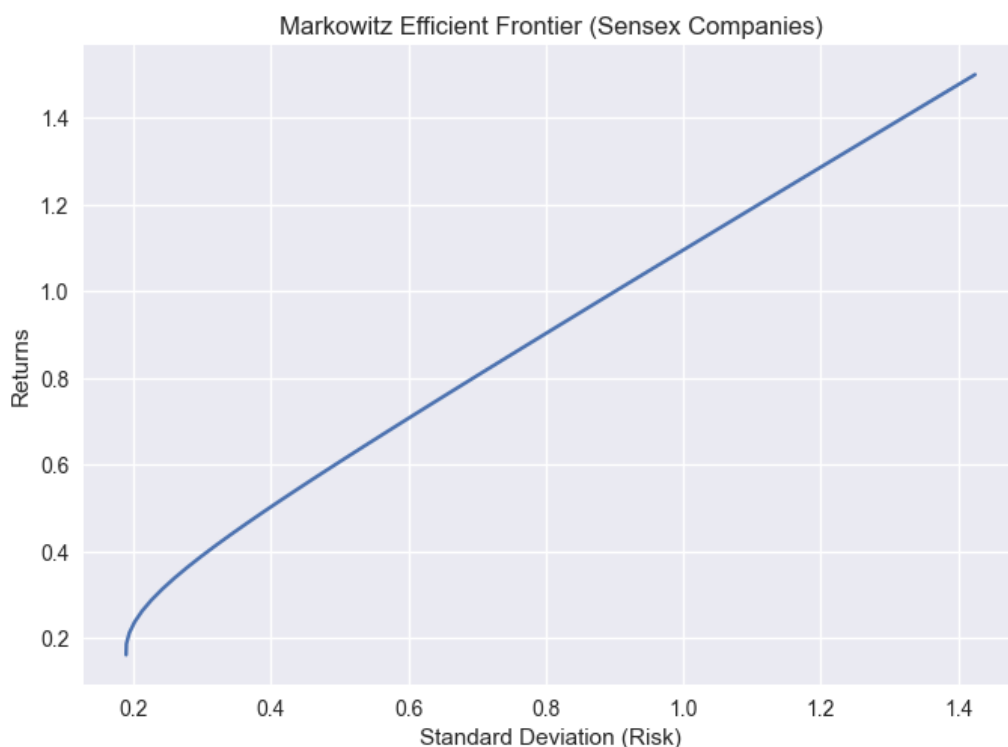
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Roll: 200123022

Question 1

Firstly data of 10 indices and 10 non indices stocks is collected for BSE and NSE. CSV file for these data is also attached. For all of them question 3 of last lab is performed.

For 10 SENSEX companies –

a) Below graph is plotted by iterating over the returns and computing the minimum risk we can achieve given the returns. Plot is plotted only for points with returns greater than the returns at the tip of the bullet to achieve the Markowitz efficient frontier.



b) Weights on the various companies stocks in the market portfolio are given below -

For Sensex Companies -

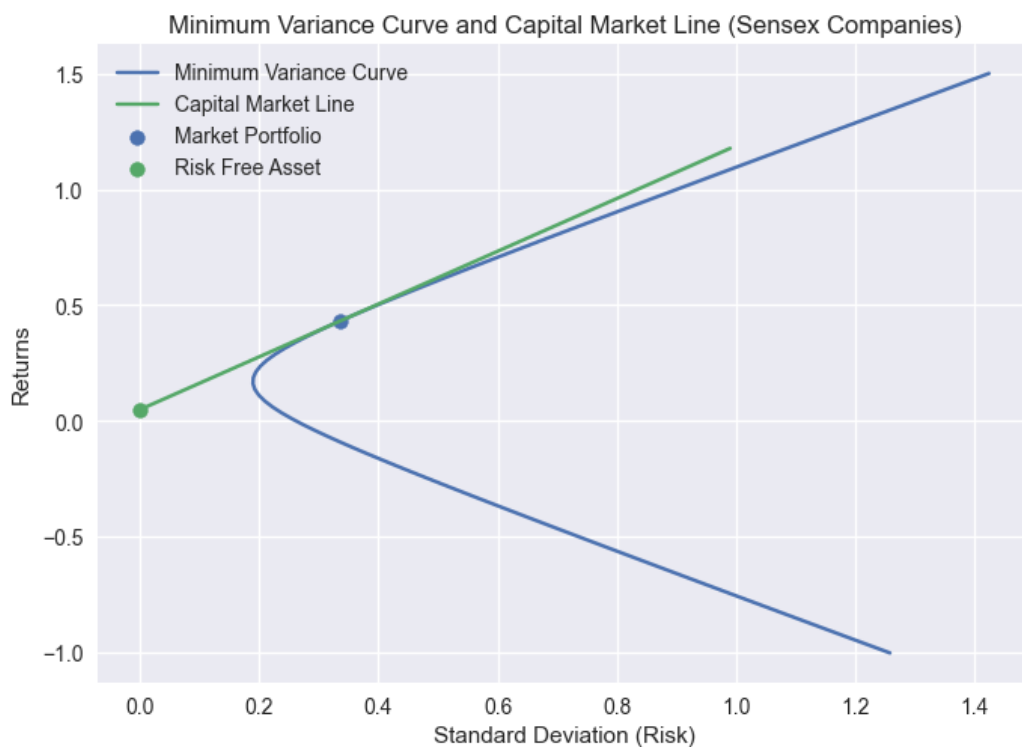
Part a - figure

Part b

Market Portfolio has Risk = 0.33677, Return = 0.43331 with following weights on assets -

Sensex Companies	Weights on their stocks
0	HDFC -0.268728
1	ICICI 0.582353
2	INFOSYS 0.523995
3	L&T 0.020731
4	ONGC -0.334610
5	RIL 0.572990
6	TATA MOTORS -0.131701
7	TATA STEELS -0.156517
8	TCS 0.352304
9	WIPRO -0.160818

c) Plot of minimum variance curve and capital market line is plotted. Market portfolio and risk free asset is also shown.



d) Security market line is plotted according to the following equation -

$$E[R_p] = R_f + (E[R_m] - R_f) \cdot \beta_p$$

where R_f is the risk free rate, $E[R_m]$ is expected return of Market portfolio and $E[R_p]$ is the expected return on any arbitrary portfolio.

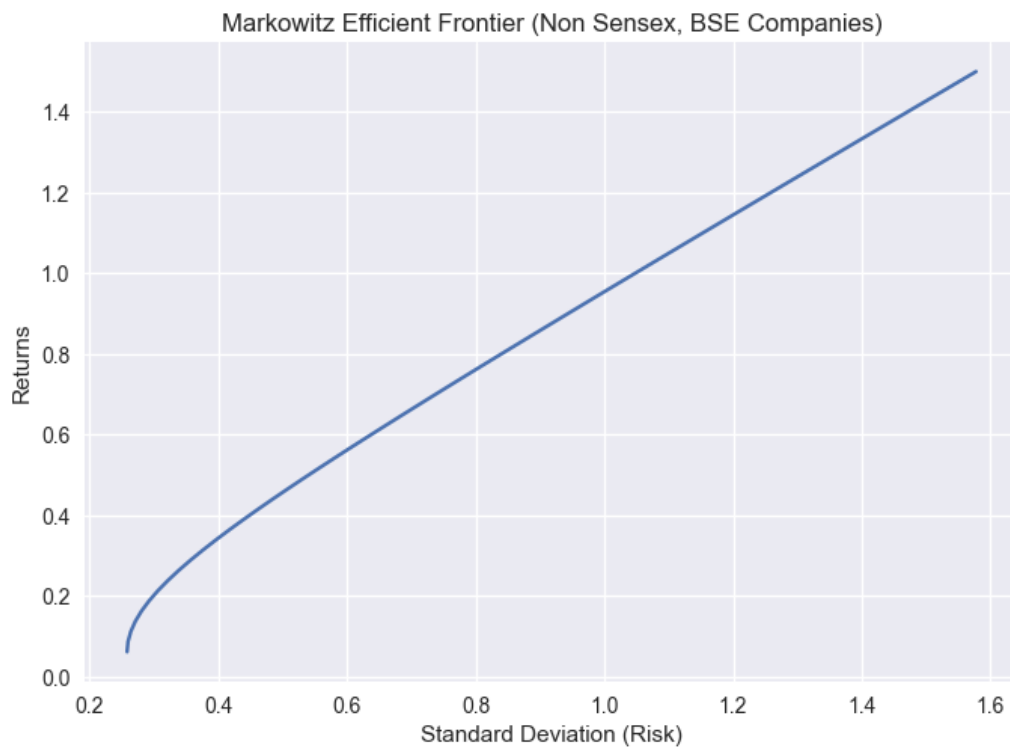
Beta values according to the CAPM model is computed using the following formula (Obtained by rearranging in the above equation)-

$$\beta_p = \frac{E[R_p] - R_f}{E[R_m] - R_f}$$



For 10 non-SENSEX BSE companies –

a)



b)

For Non Sensex, BSE Companies -

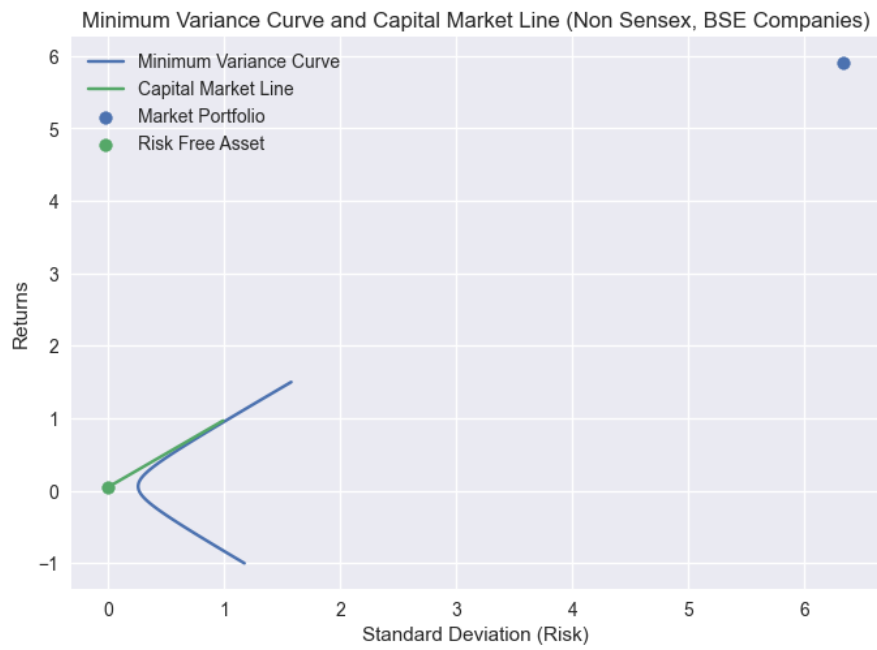
Part a - figure

Part b

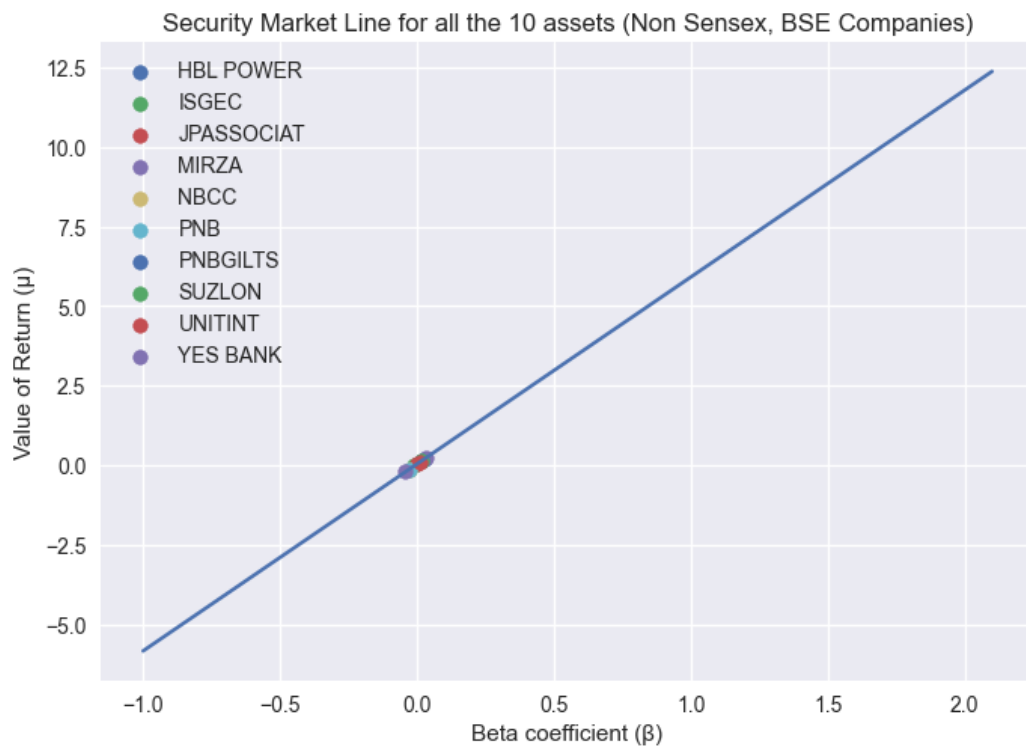
Market Portfolio has Risk = 6.33104, Return = 5.91416 with following weights on assets -

	Non Sensex, BSE Companies	Weights on their stocks
0	HLB POWER	5.746412
1	ISGEC	-1.498123
2	JPASSOCIAT	-0.660893
3	MIRZA	5.709868
4	NBCC	-6.847330
5	PNB	-7.782323
6	PNBGILTS	5.249629
7	SUZLON	1.960786
8	UNITINT	1.160987
9	YES BANK	-2.039013

c)

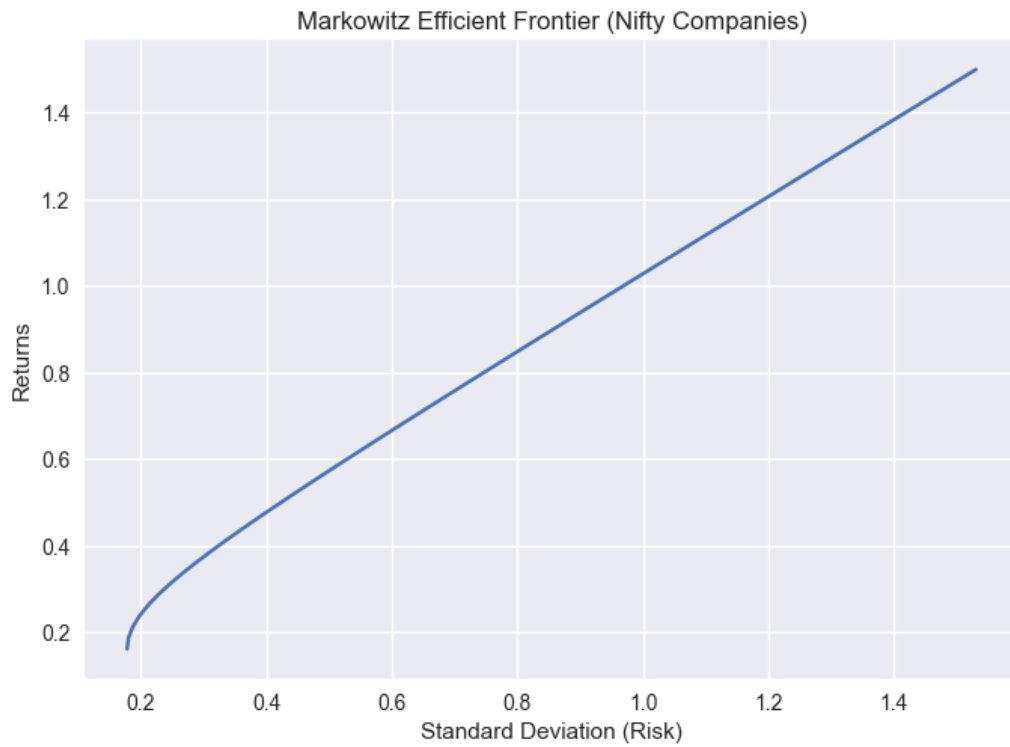


d)



For 10 NIFTY companies –

a)



b)

For Nifty Companies -

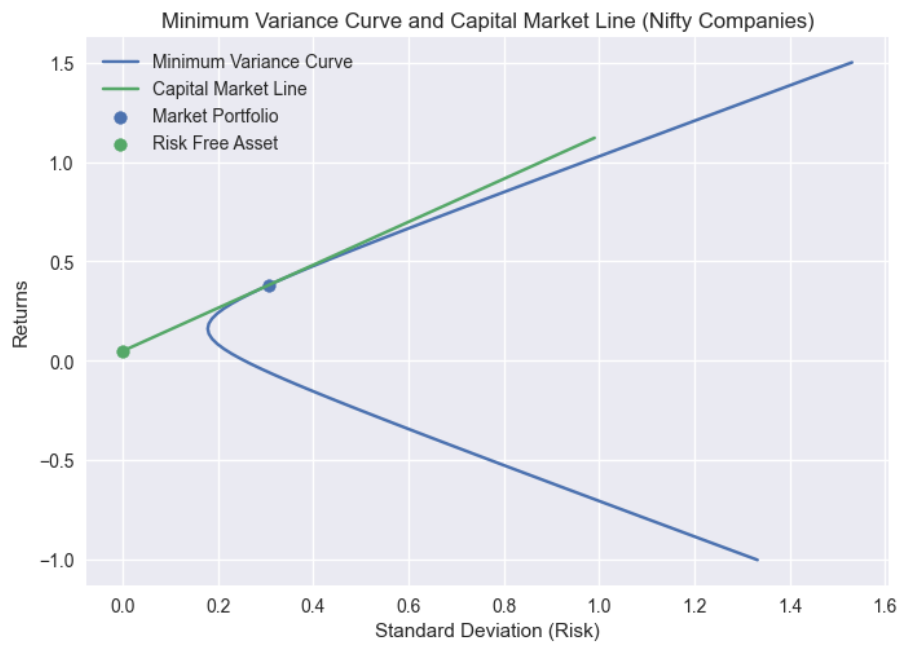
Part a - figure

Part b

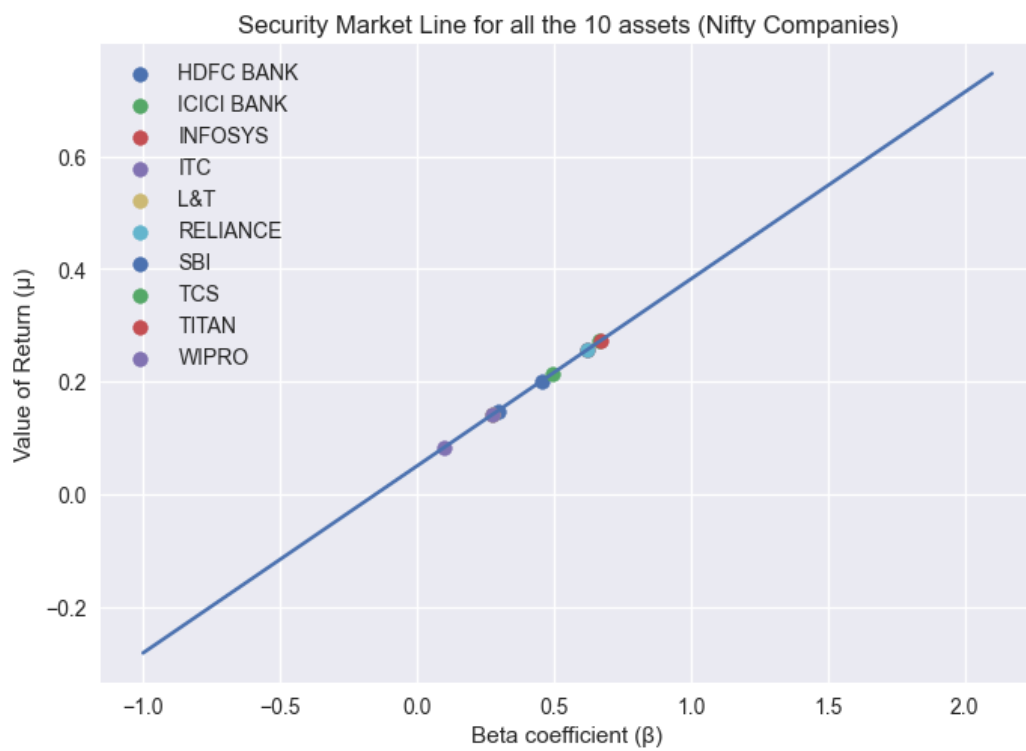
Market Portfolio has Risk = 0.30714, Return = 0.38212 with following weights on assets -

Nifty Companies		Weights on their stocks
0	HDFC BANK	-0.281026
1	ICICI BANK	0.406347
2	INFOSYS	0.498552
3	ITC	-0.222680
4	L&T	-0.218276
5	RELIANCE	0.334101
6	SBI	-0.015055
7	TCS	0.283561
8	TITAN	0.466873
9	WIPRO	-0.252395

c)

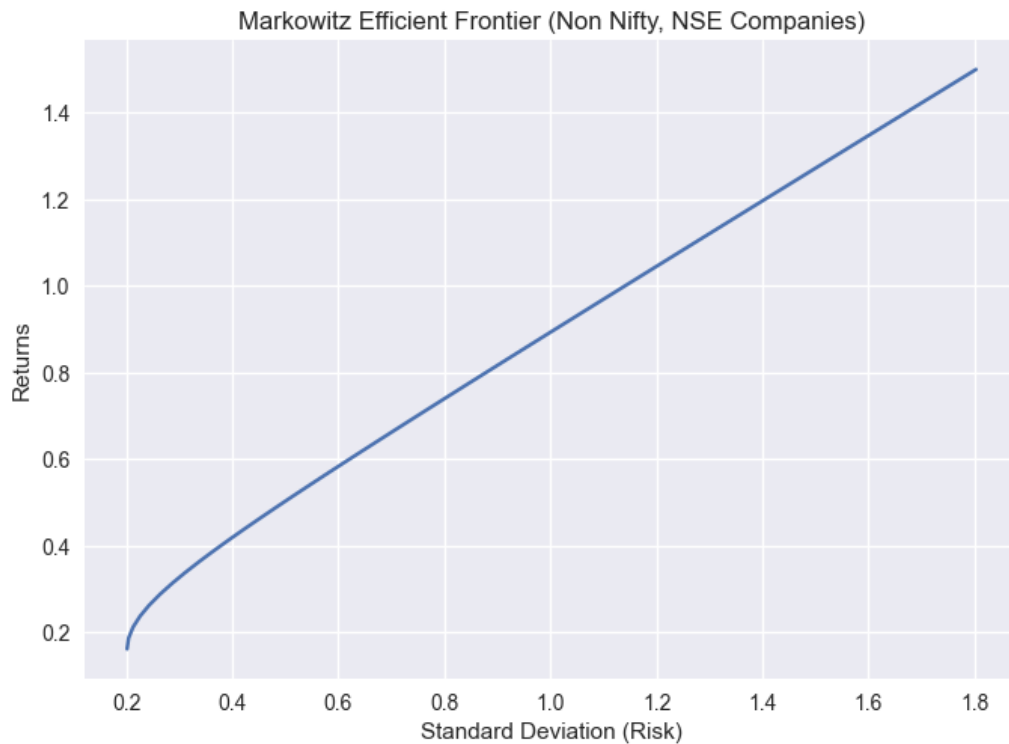


d)



For 10 non-NIFTY NSE companies –

a)



b)

For Non Nifty, NSE Companies -

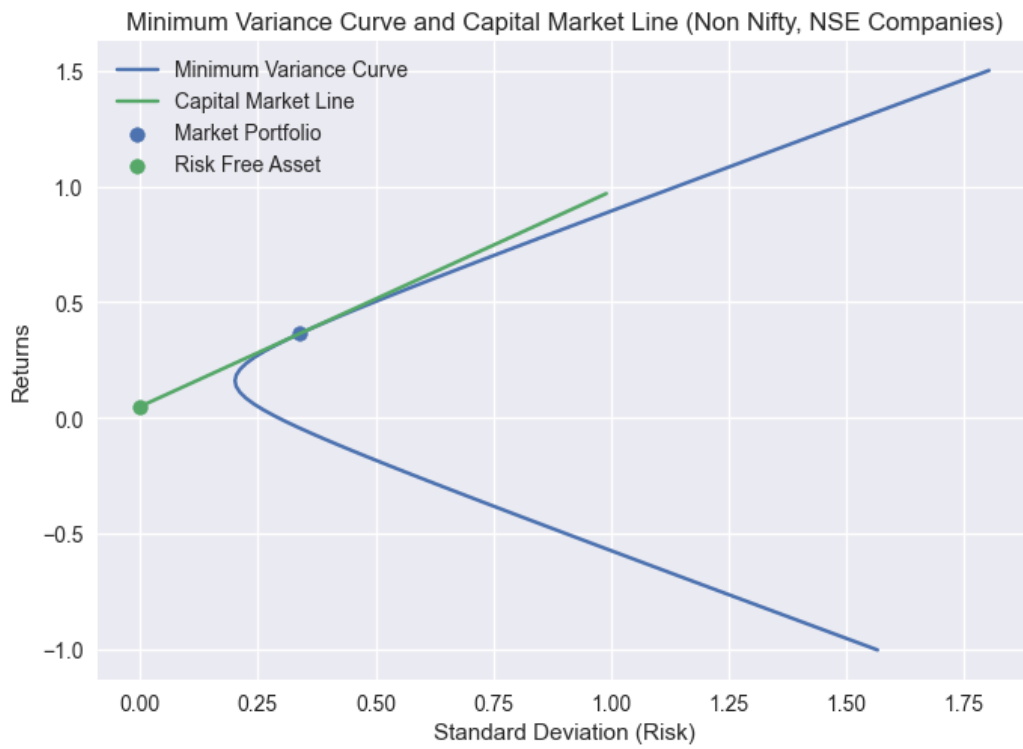
Part a - figure

Part b

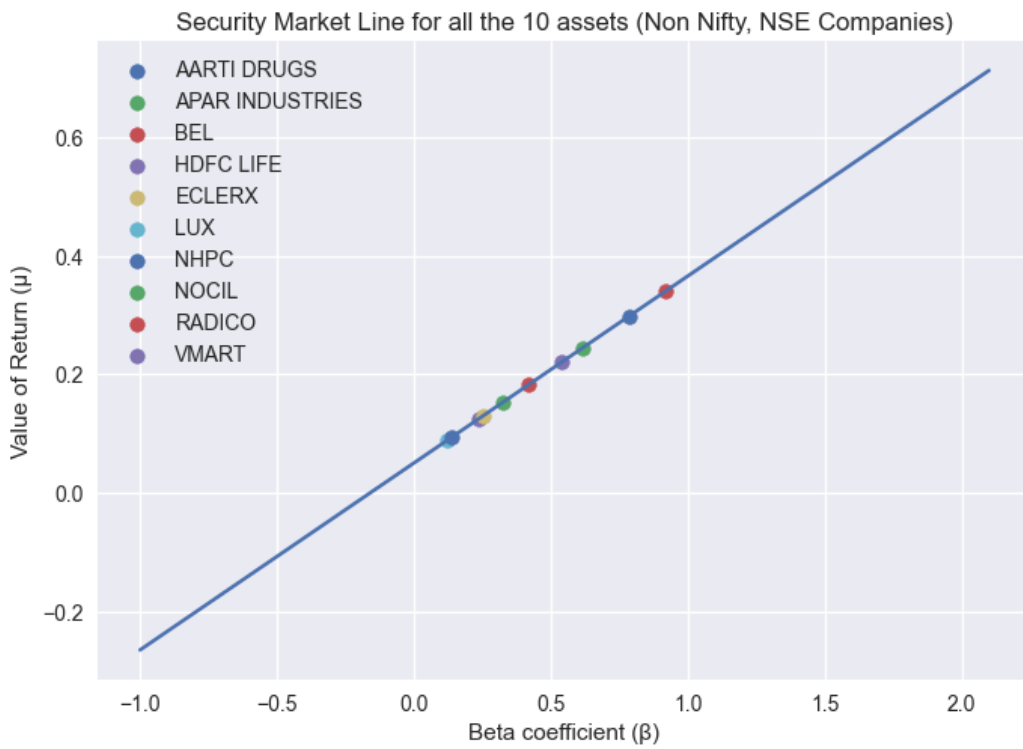
Market Portfolio has Risk = 0.34, Return = 0.36553 with following weights on assets -

Non Nifty, NSE Companies		Weights on their stocks
0	AARTI DRUGS	0.424497
1	APAR INDUSTRIES	0.322008
2	BEL	0.055799
3	HDFC LIFE	-0.021171
4	ECLERX	0.016891
5	LUX	-0.136975
6	NHPC	-0.172846
7	NOCIL	-0.120536
8	RADICO	0.481372
9	VMART	0.150960

c)



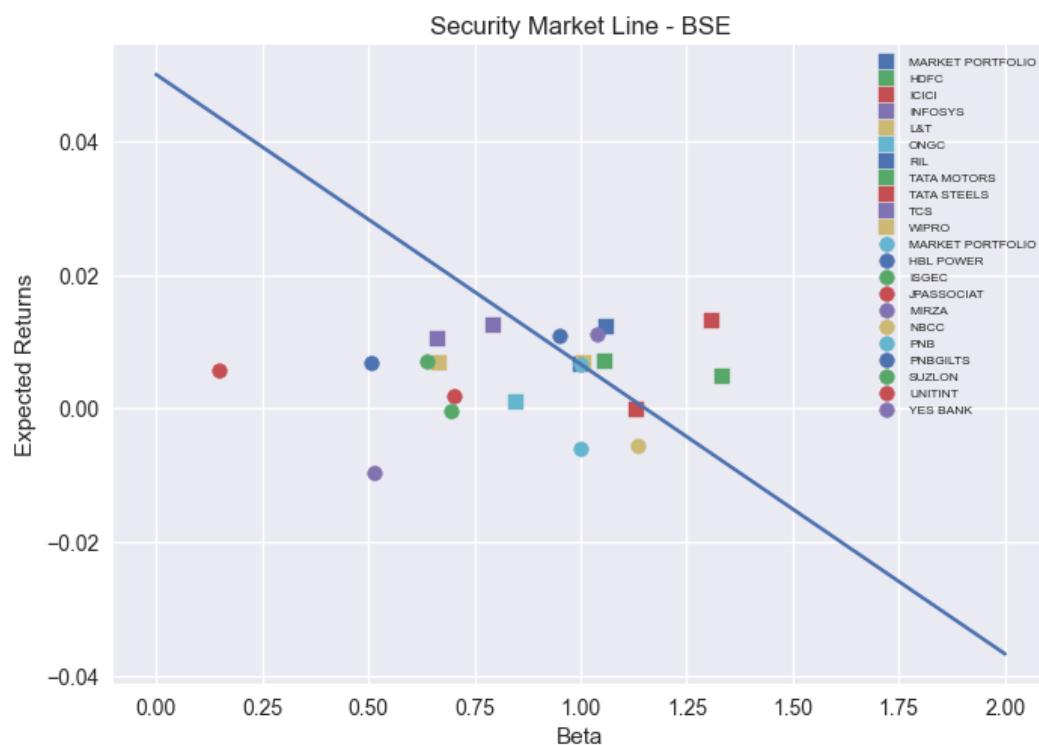
d)



Question 2

Square dots represent stocks that are included in the indices while circular dots represent stocks that are not included in the indices.

Security market line is plotted by joining $(0, R_f)$ and $(1, E[R_m])$. Where $E[R_m]$ is the expected return of the market portfolio.





Computed beta values for various data are shown below

BSE Indices	Stocks	Beta
0	HDFC	1.057218
1	ICICI	1.307430
2	INFOSYS	0.793710
3	L&T	1.008378
4	ONGC	0.847917
5	RIL	1.060938
6	TATA MOTORS	1.334114
7	TATA STEELS	1.132420
8	TCS	0.664079
9	WIPRO	0.666054

	BSE Non-Indices Stocks	Beta
0	HBL POWER	0.950123
1	ISGEC	0.695234
2	JPASSOCIAT	0.703373
3	MIRZA	1.038624
4	NBCC	1.136176
5	PNB	0.998492
6	PNBGILTS	0.507020
7	SUZLON	0.636508
8	UNITINT	0.147082
9	YES BANK	0.513156

	NSE Indices Stocks	Beta
0	HDFC BANK	0.044673
1	ICICI BANK	-0.030590
2	INFOSYS	-0.035038
3	ITC	-0.087248
4	L&T	-0.058155
5	RELIANCE	-0.085972
6	SBI	-0.075096
7	TCS	-0.103408
8	TITAN	0.018934
9	WIPRO	-0.087991

	NSE Non-Indices Stocks	Beta
0	AARTI DRUGS	-0.027320
1	APAR INDUSTRIES	0.070791
2	BEL	-0.128577
3	HDFC LIFE	0.047315
4	ECLERX	-0.032728
5	LUX	0.104460
6	NHPC	-0.155544
7	NOCIL	-0.150013
8	RADICO	0.066095
9	VMART	-0.027280