MA374-LAB4

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Roll:11012323

1.

a.

Plot of Markowitz frontier varying mean return
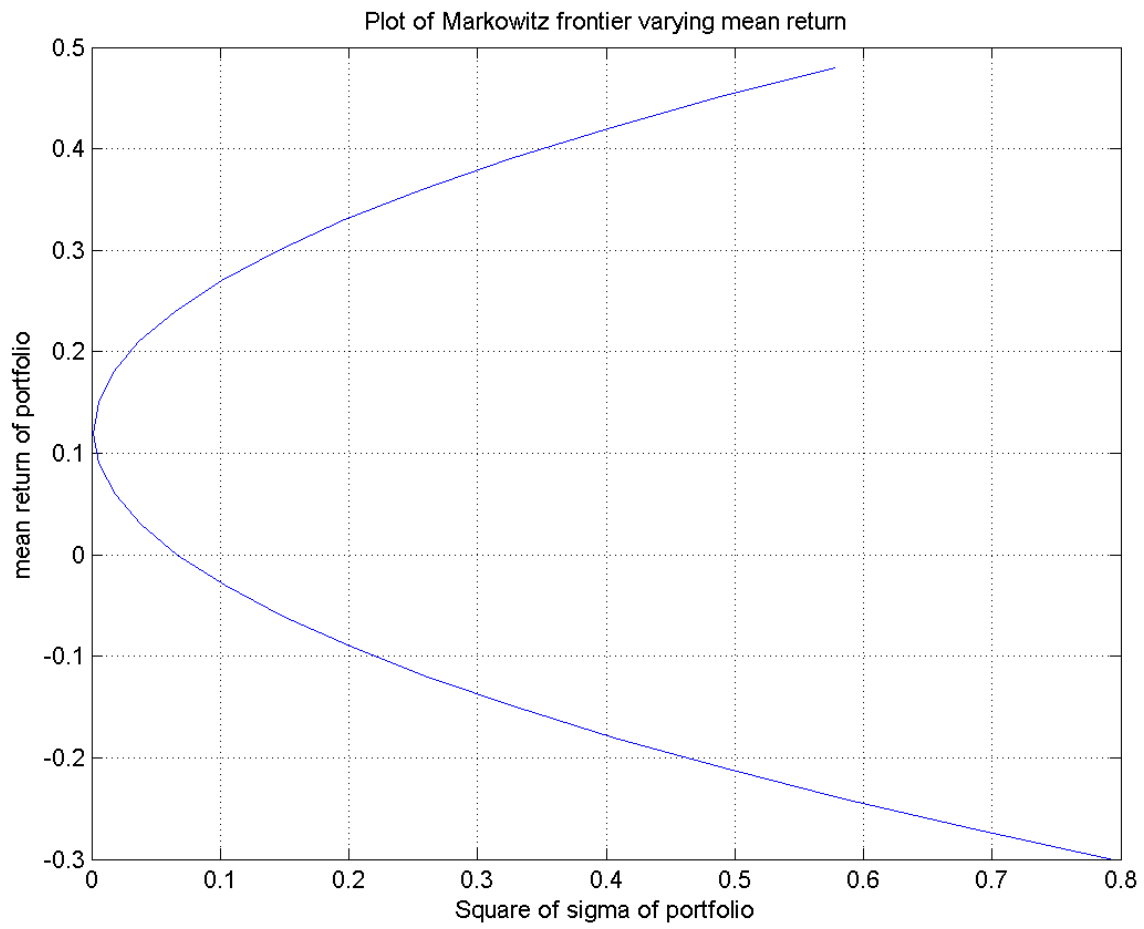
b.

Mean Return of portfolio	Minimum risk of portfolio	Weight1	Weight2	Weight3
-0.300000	0.794349	6.844037	-2.155963	-3.688073
-0.270000	0.685377	6.414679	-1.985321	-3.429358
-0.240000	0.584457	5.985321	-1.814679	-3.170642
-0.210000	0.491589	5.555963	-1.644037	-2.911927
-0.180000	0.406773	5.126606	-1.473394	-2.653211
-0.150000	0.330009	4.697248	-1.302752	-2.394495
-0.120000	0.261298	4.267890	-1.132110	-2.135780
-0.090000	0.200638	3.838532	-0.961468	-1.877064
-0.060000	0.148031	3.409174	-0.790826	-1.618349
-0.030000	0.103476	2.979817	-0.620183	-1.359633

c.

For 15 % risk maximum return is 0.052447 and the corresponding weights are: 1.799843, -0.151220, -0.648624.

For 15 % risk minimum return is 0.189555 and the corresponding weights are: -0.162436, 0.628660, 0.533775.
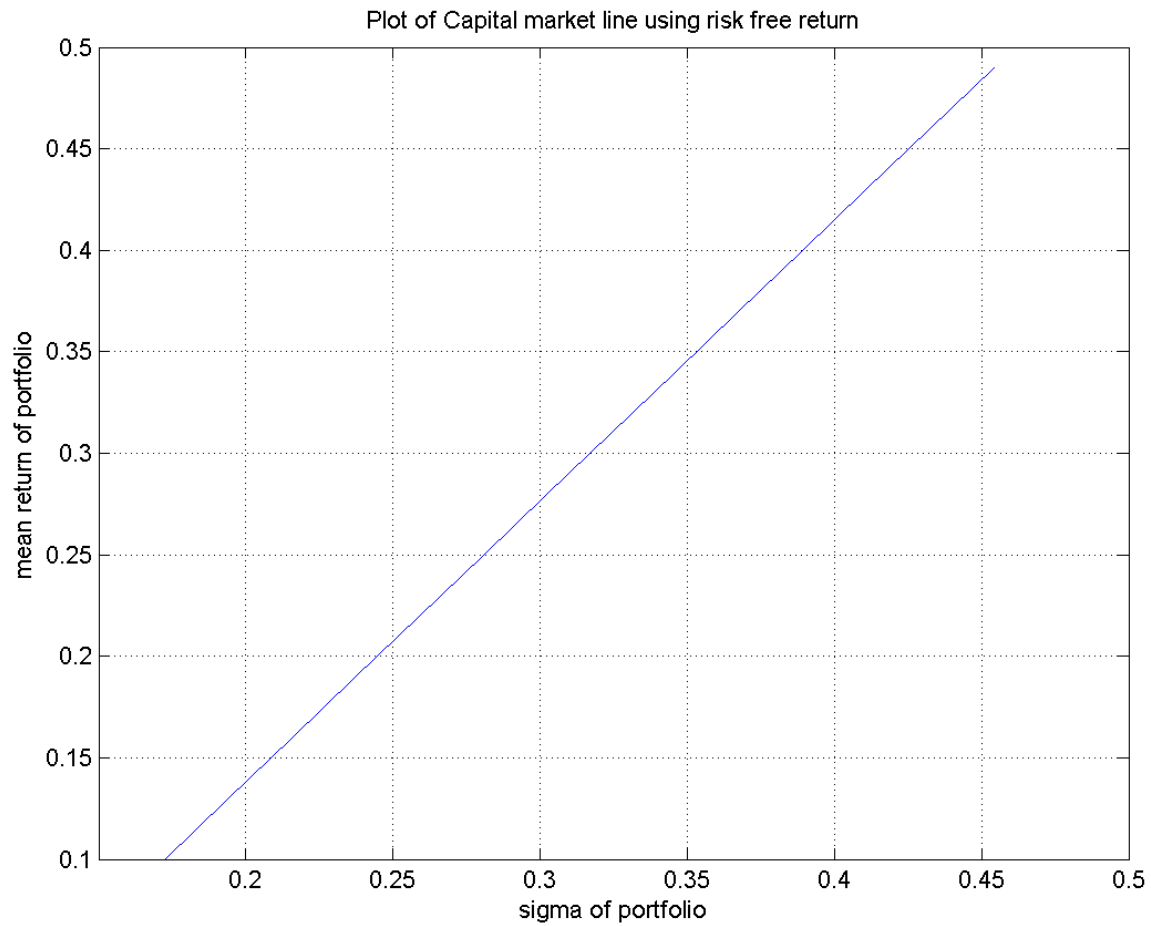
d.

For 18% return weights of minimum risk portfolio are -0.025688, 0.574312, 0.451376.

e.

Assuming risk free return of 10% weights of minimum risk portfolio are 0.593750, 0.328125, 0.078125.

The Capital market line is given by:

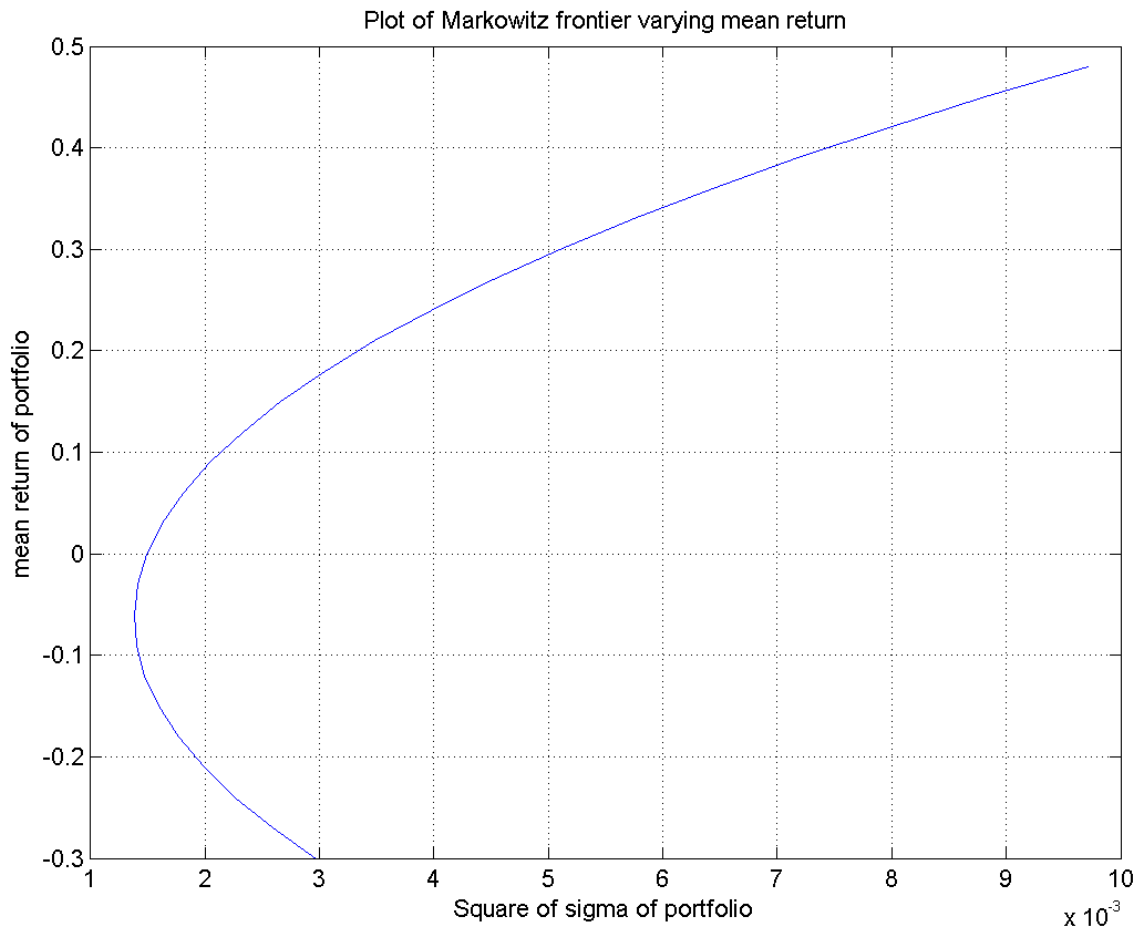## Plot of Capital market line using risk free return

f.

For the risk of 10% weight of risky and risk free assets are 1.968067, -0.968067 respectively.

For the risk of 25% weight of risky and risk free assets are 4.920166, -3.920166 respectively.
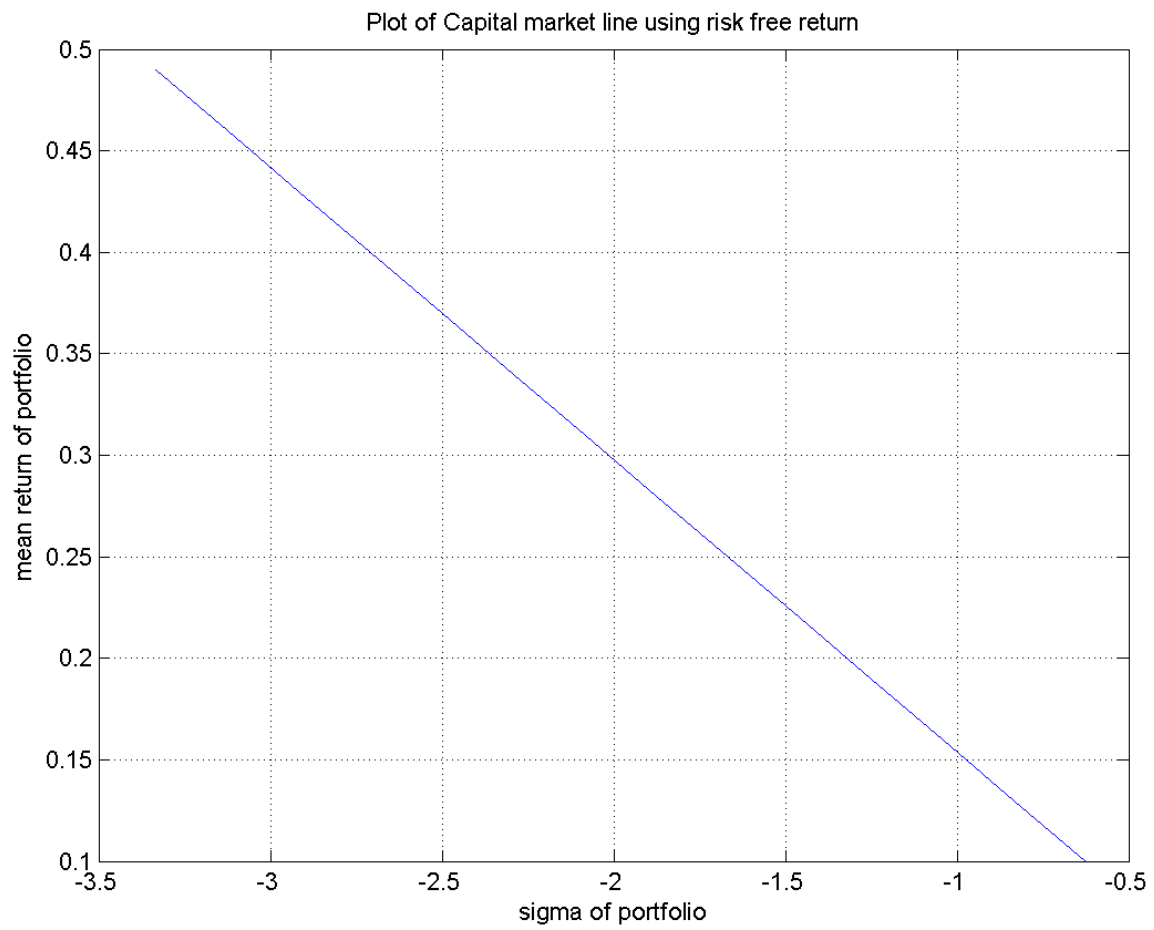
2.

a. The plot of Markowitz frontier:

Plot of Markowitz frontier varying mean return

b.

 The weights of all the 10 stocks in the portfolio are : 0.416152, 0.032472, 0.527615, -0.185373, -0.978389, -0.034939, -0.402606, -0.012072, 0.943120, 0.694021 respectively.

c. The plot of Capital Market line:

Plot of Capital market line using risk free return

d. Plot of security market for asset 1 is:

Plot of Security market line for stock 2