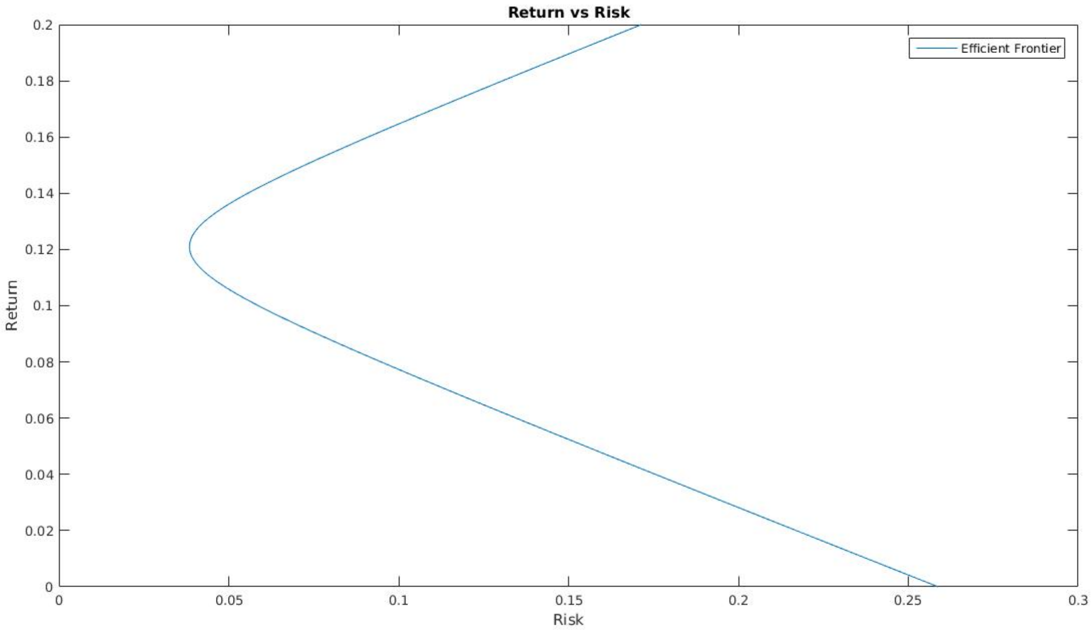
MA 374: Financial Engineering Lab
LAB 4 Report
Abheek Ghosh - 140123047

Question 1:
(a)



(b)

Weights	**Return**	**Risk**
[2.550459, -0.449541, -1.100917,]	0.000000	0.258790
[2.121101, -0.278899, -0.842202,]	0.030000	0.196269
[1.691743, -0.108257, -0.583486,]	0.060000	0.134620
[1.262385, 0.062385, -0.324771,]	0.090000	0.075999
[0.833028, 0.233028, -0.066055,]	0.120000	0.038485
[0.403670, 0.403670, 0.192661,]	0.150000	0.072378
[-0.025688, 0.574312, 0.451376,]	0.180000	0.130568
[-0.455046, 0.744954, 0.710092,]	0.210000	0.192119
[-0.884404, 0.915596, 0.968807,]	0.240000	0.254605
[-1.313761, 1.086239, 1.227523,]	0.270000	0.317473

(c)
Maximum and Minimum Return Portfolio for 15% risk

Weights	**Return**	**Risk**
[-0.162437, 0.628661, 0.533776,]	0.189555	0.150000

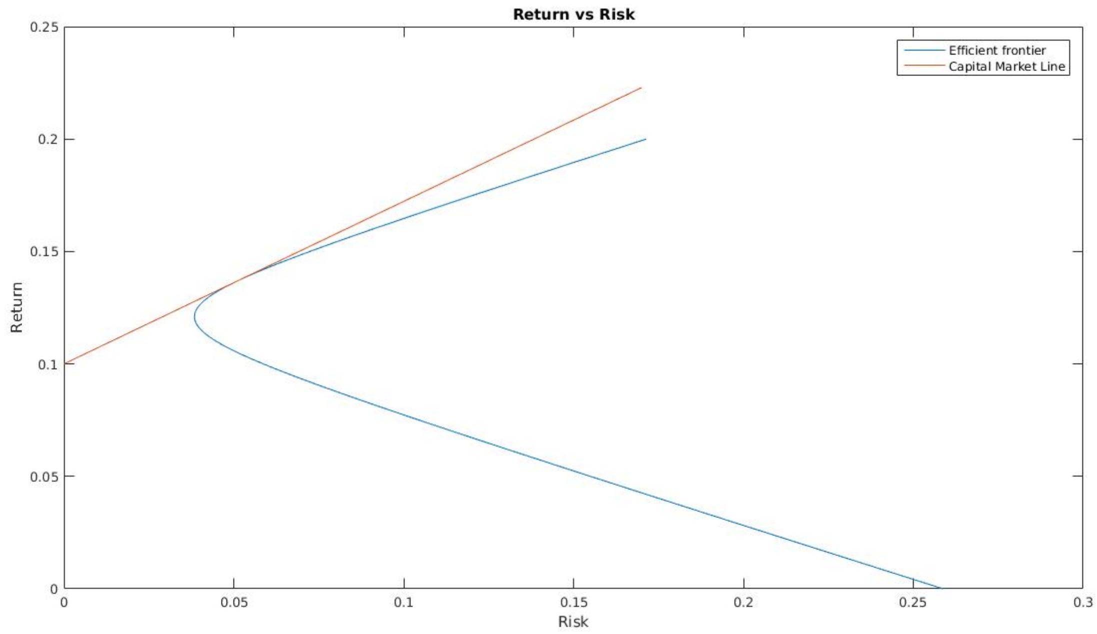
Weights	**Return**	**Risk**
[1.799843, -0.151220, -0.648624,]	0.052447	0.150000

(d)
Minimum Risk Portfolio for 18% return

Weights	**Return**	**Risk**
[-0.025688, 0.574312, 0.451376,]	0.180000	0.130568

(e)
Market Portfolio

Weights	**Return**	**Risk**
[0.593750, 0.328125, 0.078125,]	0.136719	0.050811



(f)

Mixed Portfolio with Risk = 0.100000

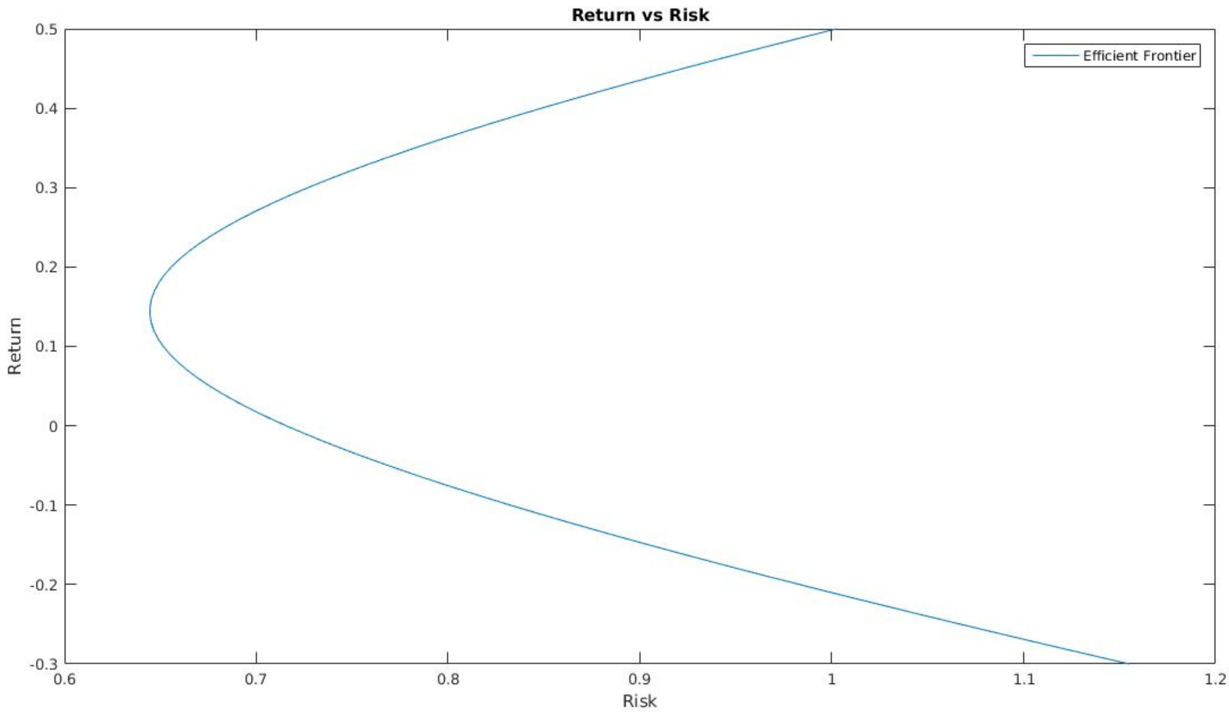
Risky Weights	**Risk Free Weight**	**Return**	**Risk**
[1.168540, 0.645772, 0.153755,]	-0.968067	0.172265	0.100000

Mixed Portfolio with Risk = 0.250000

Risky Weights	**Risk Free Weight**	**Return**	**Risk**
[2.921349, 1.614430, 0.384388,]	-3.920166	0.280662	0.250000

Question 2:

(a)



(b)

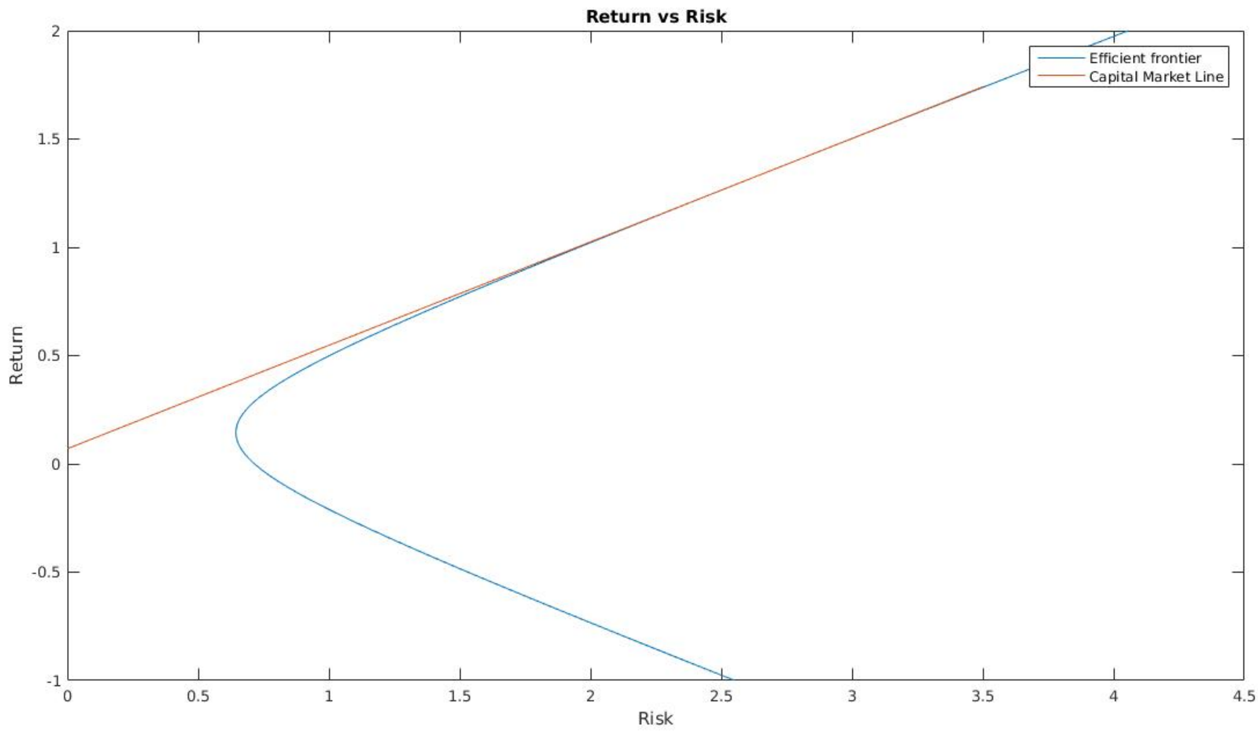
Market Portfolio

Weights: [1.154797, 0.962431, 1.804785, 0.522498, -1.332228, -0.845803, -0.612658, -0.655807, -0.604656, 0.606640,]

Return: 1.346923

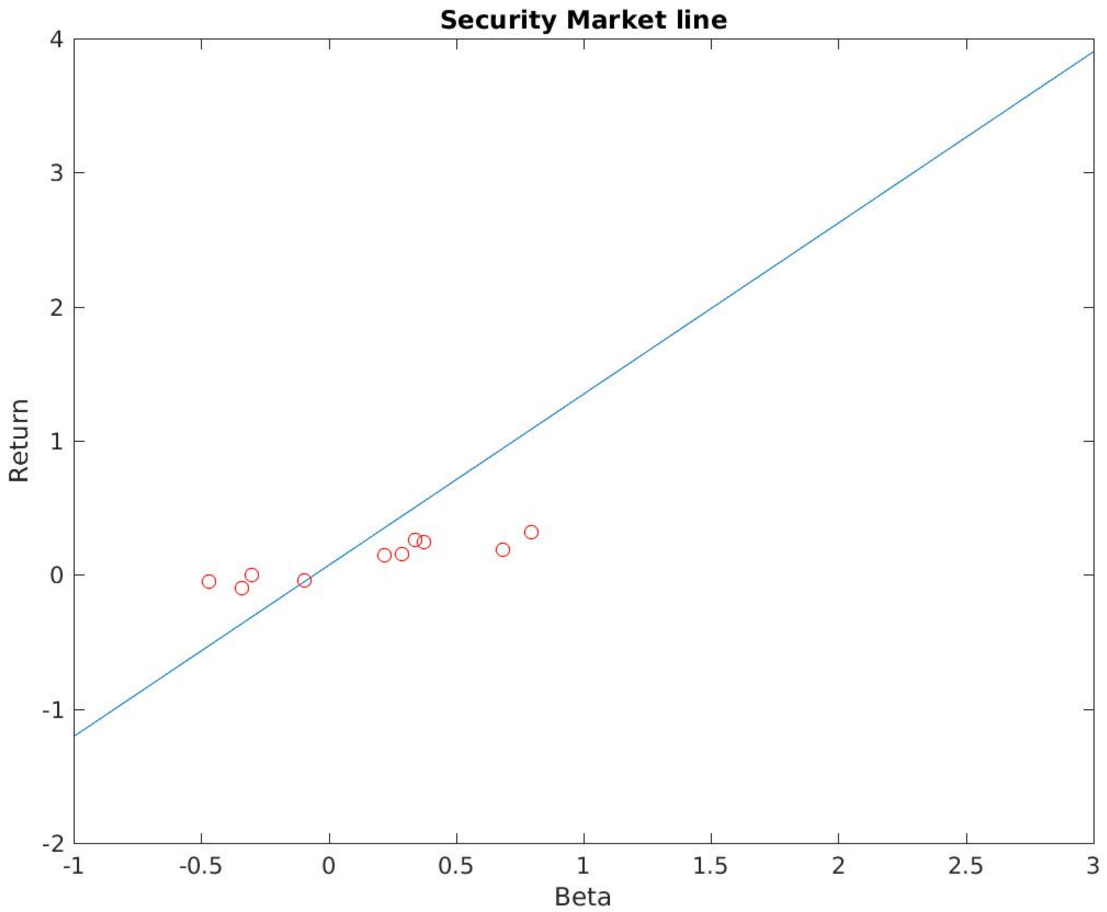
Risk: 2.674315

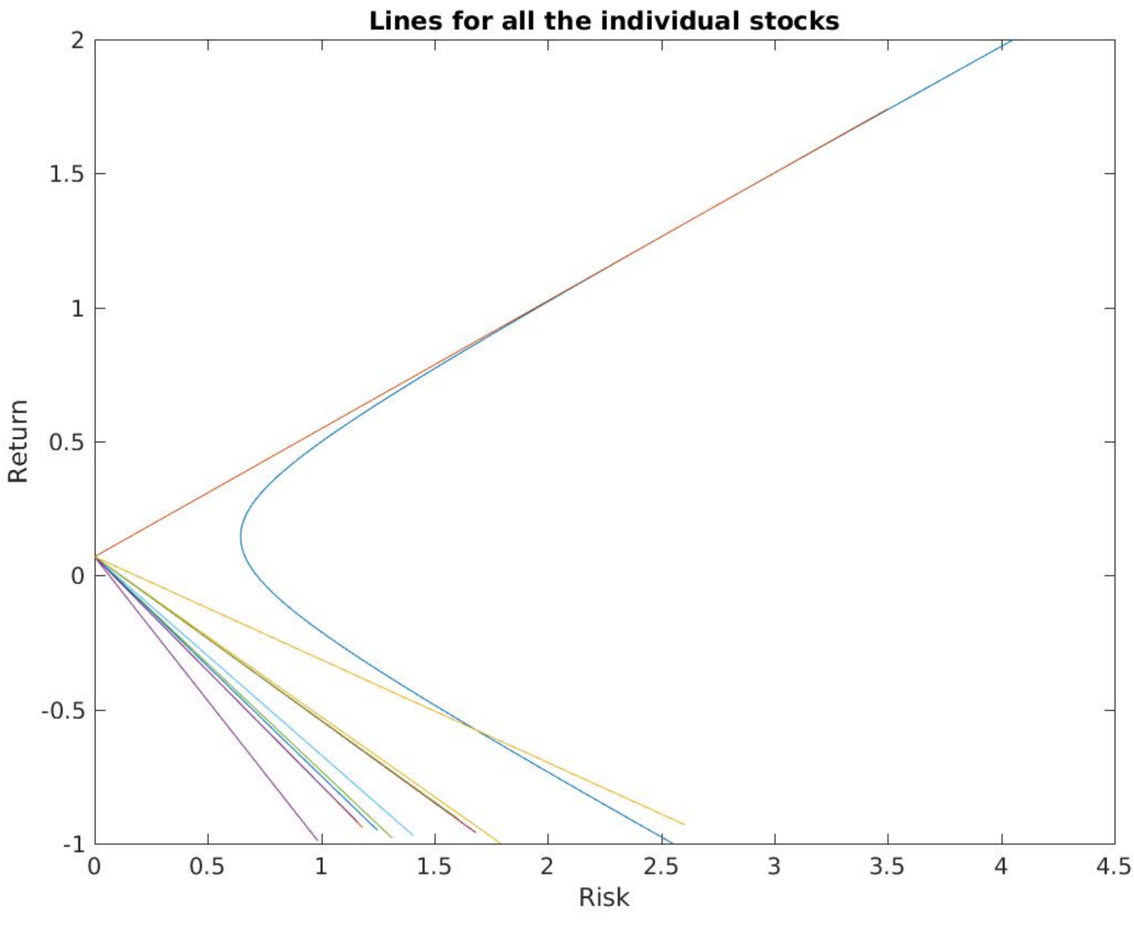
(c)



(d)

The red circles are for the individual stocks on the security market line.


Security Market line
Return
Beta
4
3
2
1
0
-1
-2
-1
-0.5
0
0.5
1
1.5
2
2.5
3


Lines for all the individual stocks
Return
Risk
2
1.5
1
0.5
0
-0.5
-1
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5