Ayush Sharma 12 February 2018

(150123046)

Question 1.

W = [[0.1 ],[0.2 ],[0.15]]

C = [[ 0.005, -0.01 , 0.004],[-0.01 , 0.04 , -0.002],[ 0.004, -0.002, 0.023]]

Table of the weights, return and risk of the portfolios for 10 different values on the efficient frontier.

| S.No. |  |  |  |
| --- | --- | --- | --- |
| 1 | [[0.001] | [[0.25669901] | [[ 2.53614679 -0.44385321 -1.09229358] |
| 2 | [0.021] | [0.21496814] | [ 2.24990826 -0.33009174 -0.91981651] |
| 3 | [0.041] | [0.17351349] | [ 1.96366972 -0.21633028 -0.74733945] |
| 4 | [0.061] | [0.13259442] | [ 1.67743119 -0.10256881 -0.57486239] |
| 5 | [0.081] | [0.09292118] | [ 1.39119266 0.01119266 -0.40238532] |
| 6 | [0.101] | [0.05715002] | [ 1.10495413 0.12495413 -0.22990826] |
| 7 | [0.121] | [0.03842682] | [ 0.8187156 0.2387156 -0.05743119] |
| 8 | [0.141] | [0.05714745] | [ 0.53247706 0.35247706 0.11504587] |
| 9 | [0.161] | [0.09291802] | [ 0.24623853 0.46623853 0.28752294] |
| 10 | [0.181]] | [0.1325911 ]] | [-0.04 0.58 0.46 ]] |

For a 15% risk, 0.18955479960806604 and 0.052446841081023425 are the maximum and minimum return and [-0.16243566, 0.62866033, 0.53377534] and [ 1.79984338, -0.1512198 , -0.64862357] the corresponding portfolios.

For a 18% return, [-0.02568807, 0.57431193, 0.45137615] is the minimum risk portfolio.

Assuming the risk free return = 10% , [0.59375 , 0.328125, 0.078125] is the market portfolio.

Two portfolios (consisting of both risky and risk free assets) with the risk at 10% and 25% are [-0.968066577128289, [1.16853953, 0.64577185, 0.1537552 ]] and [-3.9201664428207224, [2.92134883, 1.61442961, 0.384388 ]] respectively.

Plot for the given data:



Question 2.

Stocks considered 'GOOGL', 'FB', 'AAPL', 'MSFT', 'AMZN', 'ADBE', 'TYO', 'XOM', ‘BP', ‘WMT’.

Daily data points from ‘2016/12/31' to ‘2017/12/31' i.e. 252 entries for a year.

Assuming the risk free return = 7% , [-0.31854609, 0.38650368, 0.25421108, 0.17421323, 0.13069756, 0.32279627, -0.39093938, -0.64093129, 0.52652152, 0.55547343] is the market portfolio.

Plots for the given data:

1. 
2. 