1. The expected returns and standard deviation of returns for two securities are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Security Z</th>
<th>Security Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected Return</td>
<td>15%</td>
<td>35%</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>20%</td>
<td>40%</td>
</tr>
</tbody>
</table>

The correlation between the returns is + .25.

(a) Calculate the expected return and standard deviation for the following portfolios:
   i. all in Z
   ii. .75 in Z and .25 in Y
   iii. .5 in Z and .5 in Y
   iv. .25 in Z and .75 in Y
   v. all in Y

(b) Draw the mean-standard deviation frontier.

(c) Which portfolios might be held by an investor who likes high mean and low standard deviation?

2. Here are some characteristics of two securities:

   Security 1  \( E(R_1) = .10 \)  \( \sigma_1^2 = .0025 \)
   Security 2  \( E(R_2) = .16 \)  \( \sigma_2^2 = .0064 \)

Answer the following questions:

(a) Which security should an investor choose if she wants to (i) maximize expected returns, (ii) minimize risk (assume the investor cannot form a portfolio)?

(b) Suppose the correlation of returns on the two securities is +1.0, what is the optimal combination of securities 1 and 2 that should be held by the investor whose objective is to minimize risk (assume short sales are not allowed)?

(c) Suppose the correlation of returns is -1.0, what fraction of the investor’s net worth should be held in security 1 and in security 2 in order to produce a zero risk portfolio?

(d) What is the expected return on the portfolio in (c)? How does this compare with the riskless return on Treasury Bills of 10%? Would the investor want to invest in Treasury Bills?