PROBLEM SET 6

Due on Monday, May 22, 2006

To get credit for this problem set, it must be handed in on Monday, May 22 in the discussion section.

Late homework will not be accepted.


2. (Taken from Professor Quinzii’s 2005 final exam) John works at Enran, a company which offers a retirement plan: each dollar that John saves is matched by the company which doubles his investment. However the choice of investment is limited: in this matching program, John can only invest in Enran stock or in the stock of Kantron, a company founded by the brother of Enran’s founder. Fortunately the two companies are in different lines of business so that the rates of return on the companies are uncorrelated. Looking at past data, John makes the following predictions on the future rates of return:

<table>
<thead>
<tr>
<th>Probability</th>
<th>Rate of return on Enran</th>
<th>Rate of return on Kantron</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
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(a) Calculate the expected return on Enran stock and its standard deviation.
(b) Calculate the expected return on Kantron stock and its standard deviation.
(c) Calculate the covariance and the coefficient of correlation of the two rates of return.
(d) John must choose the proportion of his savings that he invests in Enran and in Kantron respectively. Being systematic, he studies the different possibilities. Calculate the expected return and standard deviation of a portfolio with the following proportions:
   i. 100% in Enran.
   ii. 70% in Enran, 30% in Kantron.
   iii. 50% in Enran, 50% in Kantron.
   iv. 30% in Enran, 70% in Kantron.
   v. 100% in Kantron.