Key to 1:25 Quiz: 2/29/12

**Quiz**: Use the following information to calculate the beta of T (AT&T) and the beta of a portfolio where you invest $200,000 in T and $300,000 in Dell which has a beta of 1.33.

<table>
<thead>
<tr>
<th>Year</th>
<th>T</th>
<th>S&amp;P500</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>+13%</td>
<td>+2%</td>
</tr>
<tr>
<td>2010</td>
<td>+16%</td>
<td>+20%</td>
</tr>
<tr>
<td>2009</td>
<td>+10%</td>
<td>+30%</td>
</tr>
<tr>
<td>2008</td>
<td>-33%</td>
<td>-40%</td>
</tr>
</tbody>
</table>

\[
\beta_T = \frac{(13 - \bar{R}) + (16 - \bar{R}) + (10 - \bar{R}) + (-33 - \bar{R})}{4}
\]

\[
\bar{R}_T = \frac{1}{4} (13 + 16 + 10 - 33)
\]

\[
\bar{R}_S&P = \frac{1}{4} (2 + 20 + 30 - 40)
\]

\[
Var(R_{S&P}) = \frac{1}{3} ((2 - \bar{R}_{S&P})^2 + (20 - \bar{R}_{S&P})^2 + (30 - \bar{R}_{S&P})^2 + (-40 - \bar{R}_{S&P})^2)
\]

\[
\beta_P = \left( \frac{200,000}{200,000 + 300,000} \right) \beta_T + \left( \frac{300,000}{200,000 + 300,000} \right) 1.33
\]