Session 6: Post Class Test Solutions

1.
   a. I would expect 50 up and 50 down days in the hundred trading days, if the market follows a random walk.
   b. With a sample size of 100, there is a standard error around the expected value. To compute the standard error, assuming a random walk, here is what I get:
      Standard error in estimate = $\frac{0.5*0.5}{\sqrt{100}} = 2.5$
      With 95% confidence, the number of up (and down days) can range from 45 to 55, making it difficult to reject the random walk hypothesis.
2. With a random walk, where there is a 50% chance of an up or down day, the likelihood of seven up or down days in a row is identical = $(0.5)^7 = 0.78\%$
   If the probability of an up day increases to 60%, the chances of seven up and down days in a row will diverge:
   Chance of seven up days (with 60% probability of up days) = $(0.6)^7 = 2.8\%$
   Chance of seven down days (with 40% probability of down days) = $(0.4)^7 = 0.16\%$
3. The matrix of default probabilities is below:

	Family Group	*Non-family Group*	*Total*
Large	6.67%	10.59%	10.00%
Small	14.29%	23.08%	20.00%
Total	12.00%	16.00%	

   c. Large company: (9+1)/ (85+15) = 10%
   d. Family Group company = (1+5)/ (15+35) = 12.00%
   e. Large non-family group company = 9/85 = 10.59%
   f. Small family group company = 5/35 = 14.29%
4. c. When the risks are independent and sequential. A decision tree is designed for sequential risks, where one uncertainty has to be resolved for another uncertainty to begin. The risks should be independent for the decision tree roll back to work.
5. When the risks are independent and concurrent. Scenario analysis can be used for risks that occur concurrently, and setting up the scenarios is easier when they are independent.