**SC531 QUIZ #01 -- SOLUTIONS**

For the following, as an example, assume M = 7 and N = 3.

Q-1 You are given 5 bowls containing 10 balls each, some white and some black. The number of white balls in the 5 bowls are, respectively: M, N, 1, 9 and 5.  
  
A bowl is selected at random and then a single ball is drawn from that bowl at random. It is found that the ball drawn is **black**. Find the five probabilities that the drawn **black** ball came from bowl #1, #2, #3, #4 and #5 respectively.

From the given data and M, N values, we get the number of BLACK balls in the five bowls as, respectively: 3, 7, 9, 1 and 5. Total = 25.

P( bowl-1 | black-drawn )

= P( bowl-1 & black-drawn ) / P( black-drawn )

= P( black-drawn | bowl-1 ) \* P( bowl-1 ) / P( black-drawn )

= [ 3/10 \* 1/5 ] / [ 25/50 ]

= 3/25

... and similarly for other bowls

Q-2 A coin is given to you which is known to be biased. In other words, for this coin, P(head) does not equal 0.5. This coin is tossed M+2N number of times, and it is seen that head shows up M+N times. What is the probability of showing up head on the next toss, that is, toss number M+2N+1?

From Laplace's rule of succession, the probability of getting head on the next toss is:

(M+N+1)/(M+2N+2) = 11/15.