**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.

Either by applying Bayes' rule, or directly by considering the number of **BLACK** balls in the five bowls, we get the required probabilities as, respectively: 3/25, 7/25, 9/25, 1/25 and 5/25.

Note that the probabilities add up to 1, AS THEY MUST.

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.