

**Math 100**

**Homework Assignment**

**Due Monday, November 19, 2007**

1. Consider flipping 3 coins. Describe  $\Omega$  - the sample space. Find some sets (events)  $A, B$  from  $\Omega$ , such that  $A, B$  are dependent.
2. A family has two children. What is the probability that both are boys, given that at least one is a boy?  
(Hint: the chances that one child is a Boy or a Girl is .5)
3. Suppose that the number of typographical errors on a single page of a given book has a Poisson distribution with parameters  $\lambda = \frac{1}{2}$ . Find the probability that there are at least two errors on page #10 (the book has more than 10 pages).
4. An urn contains  $N$  white and  $M$  black balls. Balls are randomly selected, one at a time, with replacement, until a black one is obtained. What is the probability that exactly  $n$  draws are needed.  
(Hint: use Geometric( $p$ ). the problem is to guess  $p$ )
5. Find the mean and variance of Uniform(0,1).
6. Give a real-life example of a random variable with Uniform distribution.
7. Run the applet from <http://www.stat.sc.edu/~west/javahtml/CLT.html>. Explain in words what is the CLT about.
8. **(Extra)**  $p$  in (1) from the slides stands for probability of the coin coming up H or T. Which one?  
Hint: you do not have to solve the entire problem from the very beginning, just think what this formula means.