

**Recitation 22**  
**Central Limit Theorem**  
**May 16, 2006**

1. (Example 7.8) We load on a plane 100 packages whose weights are independent random variables that are uniformly distributed between 5 and 50 pounds. What is the probability that the total weight will exceed 3000 pounds? Find an approximate answer using the Central Limit Theorem.
2. (Problem 7.6) Before starting to play the roulette in a casino, you want to look for biases that you can exploit. You therefore watch 100 rounds that result in a number between 1 and 36, and count the number of rounds for which the result is odd. If the count exceeds 55, you decide that the roulette is not fair. Assuming that the roulette is fair, find an approximation for the probability that that you will make the wrong decision.
3. (Problem 7.7) During each day, the probability that your computer's operating system crashes at least once is 5%, independent of every other day. You are interested in the probability of at least 45 crash-free days out of the next 50 days.
  - (a) Find the probability of interest by using the normal approximation to the binomial.
  - (b) Repeat part (a), this time using the Poisson approximation to the binomial.