1. A graduate student was trying to start up a population of mice for her Ph.D. research. Assuming that she started with twenty males and five females and all of the individuals in the population were equally fit, what would the effective size of that population be? (Think about this carefully..).
2. Continuing from the previous question (twenty males and five females) and assuming that $F_0=0$, what would the inbreeding coefficient F_1?
3. After the first generation (questions 1 and 2), the graduate student had enough males and females survive to adults to set up ten mating pairs, which produced 0, 1, 4, 2, 3, 2, 1, 0, 3, 4. What is the effective population size this generation? What is the expected heterozygosity of their offspring (H_2)?
4. Assuming thereafter, the population has is able to maintain itself from generation to generation, but the variance in the number of offspring contributed to the next generation is high (V=3.5). What is this populations effective population size? What is the expected heterozygosity after 7 more generations of random mating with the above calculated effective population size?