Masters Theory I
Homework #2

Out: Thursday
Due / Quiz following Thursday

- C&B 1.47

- C&B 1.51

- C&B 1.52

- C&B 1.53

- C&B 1.54

- C&B 2.1

- C&B 2.2

- C&B 2.3

- (Deb Glueck's problem from BIOS 160, UNC-Chapel Hill, 1989):
  For families with four children, it is known that the probability of a child being a boy is equal to π. Assuming that the sex of a child is independent of the sex distribution of the other children in the family, find the probabilities of the following sex distributions in a randomly selected family of four children.

  1. All children are of the same sex.
  2. The first $k \leq 4$ children are boys and the rest are girls.
  3. The first $k \leq 4$ children are the same sex, and the rest are the opposite sex.
  4. There are at least $k \leq 4$ boys in the family.
  5. The first s children are boys, and there are $k\,(s \leq k \leq 4)$ boys in the family.
  6. The first s children are boys, and there are at least $k\,(s \leq k \leq 4)$ boys in the family.

Review problems (won't be on quiz, but could be on exam)

- C&B 1.44

- C&B 1.55

- C&B 2.6

- (Deb Glueck's problem from BIOS 160, UNC-Chapel Hill, 1989):
  In a cancer study, 10 mice of strain A and 15 of strain B were treated. Each mouse has probability θ of developing cancer, independently of other mice, and altogether 8 mice developed cancer. What is the probability that exactly 4 of the mice who developed cancer were of strain B?