

**CS 333202: Probability and Statistics**  
**HW2 part 2**

1. Five men and five women are ranked according to their scores on an examination. Assume that no two scores are alike and all  $10!$  possible rankings are equally likely. Let  $X$  denote the highest ranking achieved by a woman (for instance,  $X = 1$  if the top-ranked person is female). Find  $P\{X = i\}, i = 1, 2, 3, \dots, 8, 9, 10$ .
2. Let  $X$  represent the difference between the number of heads and the number of tails obtained when a coin is tossed  $n$  times.
  - (a) What are the possible values of  $X$ ? Please note that  $X$  could be a negative number.
  - (b) If the coin is assumed fair, for  $n = 3$  what are the probabilities associated with the values that  $X$  can take on?
3. Suppose that a die is rolled twice. If the die is assumed fair, calculate the probabilities associated with the random variable in
  - (a)  $X$ , the maximum value to appear in the two rolls.
  - (b)  $Y$ , the value of the first roll minus the value of the second roll.