Homework Set 2

Reading Assignments Finish reading Chapter 3.

Written Assignments Do exercises 6, 8, 10, 23, 24, 28 in Section 3.6, plus the following special problem:

Special Problem (counted as two exercises) Recall that in the Job Offer Problem a sequence of \( n \) offers are sequentially made, and one has to make an on-the-spot decision whether to accept the current offer. Under the \( k \)-strategy, one passes on the initial \( k \) offers, and then accepts the first offer that is better than these \( k \) offers; in case no future offer is better than the first \( k \), then one just takes the very last offer. Assume that the relative merits of the offers are completely random. We have calculated and obtained in class a mathematical formula for \( r_{n,k} \), the probability of getting the best offer by using the \( k \)-strategy.

Now suppose we are less ambitious, and will be satisfied if the job we get is among the top two offers. Let \( q_{n,k} \) be the probability of achieving this goal under \( k \)-strategy. Note that clearly \( q_{n,k} \geq r_{n,k} \).

(a) What is the value of \( q_{4,2} \)? You should write down explicitly all 24 permutations, and indicate explicitly which ones result in a success by the 2-strategy.

(b) Derive a mathematical expression for \( q_{n,k} \). Check that it leads to the correct value for the case \( n = 4, k = 2 \).