

## Homework 9

*Instructor: Sandy Irani*

Covers sections 10.11, 10.12, 11.1, 11.2

## Written Homework

zyBook Exercises are labeled in the text with an "E" in the title bar. You do not have to copy the questions for any of the written homework in your solutions that you turn in.

- 1) zyBook exercise 10.11.1
- 2) zyBook exercise 10.11.2
- 3) A dozen cookies are selected at a bakery. There are six varieties of cookies: chocolate chip, sugar, ginger, oatmeal raisin, M&M, and snickerdoodles. How many ways are there to select the cookies so that there is at least one chocolate chip or M&M cookie in the selection?
- 4) A five-card hand is selected from a standard playing deck. How many hands have at least one Queen or Jack?
- 5) A subset of five numbers is selected from the set  $\{1, 2, \dots, 20\}$ .
  - (a) Use counting by complement to count the number of 5-subsets that include 1 or 2 or both.
  - (b) Use the inclusion-exclusion principle to count the number of 5-subsets that include 1 or 2 or both.
  - (c) What can you conclude about the expressions that you got for parts a) and b)?
- 6) zyBook exercise 10.12.1
- 7) zyBook exercise 10.12.2
- 8) zyBook exercise 11.1.1
- 9) For each permutation of  $\{1, 2, 3, 4, 5, 6\}$ , give the next largest permutation or indicate that the permutation is the last one in lexicographic order.
  - (a)  $(2, 3, 6, 5, 4, 1)$
  - (b)  $(2, 3, 6, 1, 4, 5)$
  - (c)  $(1, 2, 3, 4, 5, 6)$
  - (d)  $(6, 5, 4, 3, 2, 1)$
  - (e)  $(3, 6, 5, 4, 2, 1)$
- 10) For each 6-subset of  $1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13$ , give the next largest 6-subset or indicate that the 6-subset is the last one in lexicographic order.
  - (a)  $\{1, 2, 3, 4, 5, 6\}$

(b) {1, 4, 6, 10, 11, 12}

(c) {8, 9, 10, 11, 12, 13}

(d) {1, 4, 6, 11, 12, 13}

(e) {1, 4, 6, 10, 11, 13}

11) zyBook exercise 11.1.4

12) zyBook exercise 11.2.1

13) zyBook exercise 11.2.2

14) zyBook exercise 11.2.3

### Challenge Activities (marked with a "C" in the title bar)

There are no challenge activities with this assignment.