

COSC 030, Fall 2014: Problem Set #6

Assigned: Tuesday, 10/7.

Due: Tuesday, 10/14. Because I am out of town this week, please bring a hard copy of the problem set to Tonghe between 3:30 and 4:00 pm in room 330 of Saint Mary's Hall . (Late submissions should be given to the TA's during their office hours).

Lectures Covered: Week 7 (Chapters 6.1, 6.2, 6.3).

Academic Integrity: You must work alone on the problem set and not consult outside sources (with the exception of the professor and teaching assistants). See the syllabus for details on the academic integrity policy for problem sets.

Problems

1. The National Park Service's employee intranet requires a password that is either five (lower case) letters long or the name of a state in the United States (in lower case). For state names with two words (e.g., New Jersey) the password must skip the space (e.g., newjersey).

How many possible passwords are there?

(Show your work and mention which rules you are applying to derive your answer.)

2. Assume a store has two lines to pay. What is the minimum number of people waiting in line that would guarantee that one of the lines has at least 9 customers in it?
3. Assume a classroom has 30 students. The professor wants to choose a group of 3 students to grade a problem set. How many possible grading groups can he choose?
4. Assume we want to form a police line-up. The line-up room has 5 positions, labelled 1 to 5. We have a pool of 10 people to use in forming our 5-person line-up. One person in the pool is the actual suspect. For a line-up to be valid it must contain the suspect and the suspect must be in position 3.

How many different valid 5-person line-ups can we form from this pool?