CS 206: Practice problems - Lecture 3
Spring 2020

Problem 1
A valid password must satisfy the following conditions:

1. It only contains lowercase characters a to z and digits 0 to 9.
2. It contains exactly 6 characters.
3. It contains at least one digit.

Find the number of valid passwords.
**Hint:** Difference method.

Problem 2
Do problem 15.5 in the textbook.

Problem 3
Do problem 15.6(a) in the textbook.
**Hint:** Forget about the last number in the range, i.e. 10^9, for the time being. So we are only looking at numbers from 1 to 999999999. We can think of all these numbers as strings of length 9 made from digits 0 to 9: 1 can be thought of as 000000001, 10 as 000000010, and so on. We are interested in finding all such strings of length 9 that contain the digit 1. Try to instead find the strings that don’t contain the digit 1. Also, watch out for 000000000 in your counting and include 10^9 = 1000000000 at the end of your calculations.

Problem 4
Do problem 15.4 in the textbook using the bijection between subsets and binary strings we discussed in class.

Problem 5
A park at Disney World has 30 different attractions. You are planning to visit each attraction exactly once but are unsure about the order in which you want to visit them. How many possible ways are there to visit each of the 30 attractions exactly once? (Basically, what is the number of different possible “orders”)?