CS 206 HW 1

Fall 2020

1. Two password policies are being considered. The first allows passwords to contain any letter (upper or lowercase), number, or the special characters \$, #, %, ^, and &, and requires the password length to be exactly 16 characters. The second policy limits passwords to only lowercase characters, but uses a length of exactly 24 characters. Which policy is more secure?

2. How many numbers between 1 and 1,000,000 contain either a 1 or a 5 (or both)?

3. Eight students (Anna, Brian, Carol, ...) are to be seated around a circular table with eight seats, and two seatings are considered the same arrangement if each student has the same student to their right in both seatings.

   (a) How many seatings of the eight students are there?

   (b) How many arrangements of the eight students are there?

   (c) How many arrangements of the eight students are there with Anna sitting next to Brian?

   (d) How many arrangements of the eight students are there with Brian sitting next to both Anna and Carol?

   (e) How many arrangements of the eight students are there with Brian sitting next to either Anna or Carol?

4. The faculty of a department has six women and nine men. How many ways can we select a committee of 5 members if at least 1 woman must be on the committee?

5. How many ways can we pick three distinct integers from $\{1, 2, ..., 15\}$ such that their sum is divisible by 3?