

**Assignment #4 - due in class on Oct. 27, 2015**

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1. Compute the number of passwords of length 6 or 7 using English lowercase letters (a-z) and/or digits (0-9) such that
  - a. A password includes at least one letter.
  - a. A password contains no repeated digits.
  - b. A password contains at most two digits.
  - c. A password includes at least one letter and contains no repeated digits.
2. How many strings of length 6 decimal digits where any of the digits appears exactly 2 times?
3. Suppose  $S = \{1, 2, \dots, 8\}$ .
  - a. Find the number of subsets  $T \subseteq S$  of size six such that  $T$  contains three odd numbers and three even numbers.
  - b. Find the number of subsets  $T \subseteq S$  of size five such that  $T$  contains at least one even number.

**A Solved Problem:**

How many strings of length 6 decimal digits where any of the digits appears exactly 3 times?

**Solution:** If any digit appears exactly three times, then the string will have two distinct digits, each appearing three times. This can be approached as follows, select the two digits and then chose the positions to place one of the digits; the remaining position will be filled by the other digit.

Answer:  $N = C(10,2) * C(6,3) * 1 = (10*9/2) * (6*5*4/3*2) = 45*20 = 900$