

**ECS20**  
**Homework 9: Counting**

*Counting: product rule and sum rule*

**Exercise 1:**

How many strings are there of four lowercase letters that have the letter x in them?

**Exercise 2**

How many strings of four decimal digits

- a) Do not contain the same digit twice?
- b) End with an even digit?
- c) Have exactly three digits that are 9s?

**Exercise 3:**

How many license plates can be made using either three digits followed by three letters, or three letters followed by three digits?

**Exercise 4:**

How many subsets of a set with 100 elements have more than one element?

**Exercise 5:**

How many bit strings of length 10 contain either five consecutive 0s or five consecutive 1s?

**Exercise 6:**

Use a tree diagram to find the number of bit strings of length four with no three consecutive 0s.

**Exercise 7:**

From a group of 13 men, 8 women, 2 boys and 4 girls,

- (a) How many ways can a man, a woman, a boy and a girl be selected?
- (b) How many ways can a male and a female be selected?
- (c) How many ways can a person be selected?

**Extra credit:**

How many numbers in the range 100-999 have no repeated digits? (For example, 110 and 211 have repeated 1, while 101 is OK) Now how many of them are even? (be careful!).