GM – Probabilités et Statistique – Exercise Set 2

In class

Exercise 1 Pizza. After a long afternoon working in your statistics course (!) you decide to order a pizza. There are 3 types of base and 5 different toppings, and in addition you can order the pizza with or without cheese.

(a) If you choose only one topping, how many different pizzas are possible ?
(b) Suppose that you would like to have *two different toppings* on your pizza. How many different pizzas are possible now ?

Exercise 2 Club officers. A president, tresurer, and secretary, all different, are to be chosen from a club of 10 people. How many different choices of officers are possible if :

(a) there are no restrictions ?
(b) A and B will not serve together ?
(c) C and D will serve together or not at all ?
(d) E must be an officer ?
(e) F will serve only if he is president ?

Exercise 3 Passing an exam. A professor gives her class a set of 10 problems with the information that the final exam will consist of a random selection of 5 of them. If a student has figured out how to do 7 of the problems, what is the probability that he or she will answer correctly

(a) all 5 problems,
(b) at least 4 of the problems ?

At home

Exercise 1 Experimental design. You envision an experiment on the influence of light and fertilizer on plant growth. You will use 5 levels of fertilization and 2 levels of lighting. For each combination of levels of fertilizer and lighting, you would like to have 4 replications. What is the total number of replications in the experiment ?

Exercise 2 Language course. An elementary school is offering 3 language classes : one in Spanish, one in French, and one in German. The classes are open to any of the 100 students in the school. There are 28 students in the Spanish class, 26 in the French class, and 16 in the German class. There are 12 students that are in both Spanish and French, 4 that are in both Spanish and German, and 6 that are in both French and German. In addition, there are 2 students taking all 3 classes.

(a) If a student is chosen randomly, what is the probability that he or she is not in any of the language classes ?
(b) If a student is chosen randomly, what is the probability that he or she is taking exactly one language class ?
(c) If 2 students are chosen randomly, what is the probability that at least 1 is taking at least 1 language class ?