GM – Probabilités et Statistique – Exercise Set 3

In class

Exercise 1 You ask your neighbor to water a sickly plant while you are on vacation. Without water, it will die with probability .8 ; with water, it will die with probability .15. You are 90% certain that your neighbor will remember to water the plant.

(a) What is the probability that the plant will be alive when you return ?

(b) If the plant is dead upon your return, what is the probability that your neighbor forgot to water it ?

Exercise 2 What is the probability that among 5 families, each with 6 children, that at least 3 of the families have 4 or more girls ? *Specify your assumptions.*

Hint : Consider example 3.6 from the lecture.

Exercise 3 A student is getting ready to take an important oral examination and is concerned about the possibility of having an 'on' day (en forme) or an 'off' day (pas en forme). His opinion is that if he has an 'on' day, then each of his examiners will pass him, independently of each other, with probability 0.8, whereas is he has an 'off' day, this probability will be reduced to 0.4. Suppose that the student will pass the examination if a majority of the examiners pass him. If the student feels that he is twice as likely to have an 'off' day as he is to have an 'on' day, should he request an examination with 3 examiners or with 5 examiners ?

At home

Exercise 1 A man claims to have extrasensory perception (ESP). As a test, a fair coin is flipped 10 times and the man is asked to predict the outcome in advance. He gets 7 out of 10 correct. What is the probability that he would have done at least this well if he had no ESP ?

Exercise 2 It is known that diskettes produced by a certain company will be defective with probability 0.01, independently of each other. The company sells the diskettes in packages of size 10 and offers a money-back guarantee that at most 1 of the 10 diskettes in the package will be defective. The guarantee is that the customer can return the entire package of diskettes if he or she finds more than one defective diskette in it. If someone buys 3 packages, what is the probability that he or she will return exactly one of them ?