GM – Probabilités et Statistique – Exercise Set 4

In class

Exercise 1 Suppose that $P(X = a) = p$, $P(X = b) = 1 - p$.

(a) Show that $\dfrac{X - b}{a - b}$ is a Bernoulli RV.

(b) Find $Var(X)$.

Exercise 2 The expected number of typographical errors on a page of a certain magazine is 0.2. What is the probability that the next page that you read contains no typographical errors ? Explain your reasoning.

Exercise 3 The number of colds that an individual catches in one year is a Poisson random variable with parameter $\lambda = 5$. Suppose that a miraculous remedy (based on the effect of vitamin C) has been put on the market and that it lowers the parameter λ to 3 for 75% of the population. For the remaining 25% of the population, the remedy does not have any appreciable effect. An individual tries this medication for one year and catches two colds. What is the probability that the remedy had an effect on him ?

At home

Exercise 1 For a binomial random variable X with expected value 6 and variance 2.4, find $P(X = 5)$.

Exercise 2 The expected number of typographical errors on a page of a certain magazine is 0.2. What is the probability that the next page that you read contains two or more typographical errors ?