

**Ex 3.1** Consider a French roulette table: it is a wheel of luck with 37 cells. There are various betting schemes. We consider some of them. You may bet on a particular number between 1 and 36. If that number appears, you get 36 times the amount. If the number does not appear, you loose. Let  $X_i$  be the associated dollar amount you receive for 1 dollar you place on the number  $i$ . Compute the expectation of  $X_i$ . Compute the variance of  $X_i$ . Do the same for  $Y_p$ : this represents your bet on even numbers. Interpret the results you get.

**Ex 3.2** Write an R-program that inputs a vector and, assuming that it represents a random variable over a Laplace-space, computes its expectation and variance. Test it on the results you obtained in the previous exercise.

**Ex 3.3** Write an R-program that inputs the a priori probabilities for a Bernoulli experiment and a vector and computes the a posterior probabilities. *Hint.* The a priori probabilities take the form of just a single value; the vector you may take either as a vector of reals (either 0 or 1), or a Boolean vector.