STATISTICS FALL 2005

MARCUS KRACHT

ASSIGNMENTS, PART 5.

Ex 5.1 Let $\mathcal{P}$ be a Laplace space with 3 elements. Define the following random variable: $X(0) = 2$, $X(1) = 3$ and $X(2) = 5$. Let us take a sample $\langle X_1, X_2, X_3 \rangle$. Now consider the following statistic: (a) the sample sum, (b) the sample median. Compute the mean and variance of both.

Ex 5.2 Consider a Bernoulli experiment. The initial hypothesis is H_0: $p = 0.5$ and the alternative is H_1: $p = 0.8$. Write a function that computes the ratio $P(a(\omega) = k|H_0)/P(a(\omega) = k|H_1)$. Compute these values for the following series: (a) ω consists of the same number of 0s and 1s; (b) ω consists of twice the number of 1s and 0s and (c) ω consists of twice the number of 0s and 1s. What happens when the length of ω increases in each of these cases?

Ex 5.3 Consider again your program for 5.1 and the sum statistic. Rewrite into a very short program using `outer` and `as.vector` and the inbuilt functions `mean` and `var`. (Can you do the same for the median?)