**Introduction to R**

**Session 5: Over and over**

1. Using the code from the slides, obtain the approximate value of:  
   1. The expected value of the median of a sample of size 501, from the Exp(1) distribution
   2. The variance of the same random variable  
        
      In both cases, compare your answers to those in the slides, that use samples of size 51.
2. The correlation of two random variables can be obtained using the cor() function, so for example in the built-in mtcars dataset, the correlation of weight and miles per gallon can be obtained from  
     
   with(mtcars, cor(mpg, wt))  
     
   Using the correlation as the test statistic, implement a permutation test of the null hypothesis that mpg and wt are uncorrelated.