Introduction to R
Session 5: Over and over

1. Using the code from the slides, obtain the approximate value of:

   a. The expected value of the median of a sample of size 501, from the Exp(1) distribution
   b. 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.