DATA130004: Homework 3

Due in class on November 2, 2017

1. Exercises 5.6, 5.9 and 5.10.

2. Use Monte Carlo method to approximate the fraction of a d-dimensional hypersphere which lies in the inscribed d-dimensional hypercube. In class, we have discussed $d = 2$ case. Now, try dimensions $d = 3, 4, \ldots, 10$. Hint: use `apply` function.

   (1) Derive the formula for the EXACT values for the above problem for each d-dimension.

   (2) Using the previous results, approximate the value of π. Find the number of points used which approximates π to the 4th digit for each d. Set the random seed with `set.seed(123)` at the beginning of your R code.