

DATA130004: Homework 2

Due in class on October 8, 2016

1. Exercises 5.3
2. Exercises 5.4, also compare the ‘hit-or-miss’ method. Please explain which method is better.
3. Exercises 5.9
4. 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 $d = 3, 4, \dots, 10$. 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.