R-assignment 2

Math 362

Use the R-code given in R-assignment 1 to answer the following questions. Turn in your R-code and the outputs.

1.
(a) First open the data set called trees, by entering
$>$ $data(trees)$
If you would like to see the data set, enter $>$ $trees$.

(b) The data trees is already in a data frame.
Extract the vector *height* out of the data frame. Then calculate the mean height.

(c) Access the element in row 2, column 3.

(d) Access the first three row elements.

(e) Extract the data in the data frame for which the *volume* is smaller than 50.

2.
(a) Create a vector, x, with values -2, -1.9, -1.8,....., 1.8, 1.9, 2.

(b) Create the function $f(x) = x^2$ using the function command. Plot f as a function of x using the command plot(x,f(x),type="l"). Label the x-axis for x and the y-axis for y. Include a title and a color of your choice in the plot command.

(c) Put x and $f(x)$ in a data frame.

3.
Calculate the product $\prod_{k=1}^{i}(1+\frac{k}{5})$ for $i = 1, 2, ..., 8$ using a for loop. (See the last page in R assignment 1). Put the data in a data frame.

4.
(a) Simulate 60 flips of a fair coin in R. Let tail=0 and head=1. Estimate the probabilites of head from the simulated flips to two decimal places.
Use the command $sample(x, n, replace = T)$, where x is the vector of 0 and 1 and n is the number of flips. See lecture notes from 2.1.

(b) Now suppose that the coin is slightly bent such that the probability of obtaining a head is 0.8. Simulate 60 flips of such a coin in R. Hint: Create a weight $w = c(0.2, 0.8)$. Then use the command $sample(x, n, replace = T, prob = w)$. Give the estimated probability of head from the simulation to two decimal places.