Scientific Computing :: Drop In

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Activity: R Coding

Functions in R

Functions are small parts of code that are frequently used in the main program or R script. Writing functions allows your R script to be better structured and therefore easier to read. The use of functions also minimises redundant code and helps to avoid programming errors.

In this session, your task is to write a function calculating the coefficient of variation. This relative measure of variation is commonly defined as standard deviation divided by arithmetic mean, i.e. in R coded as `sd(...) / mean(...)`.

Download the small data set in file `Plot1.txt` from `https://github.com/apommerening`. The ASCII file has 101 observations relating to the data of research plot 1 in Lligwy Woods on the Isle of Anglesey in North Wales. The data are from a natural woodland of ash (*Fraxinus excelsior* L.) and sycamore (*Acer pseudoplatanus* L.), where I studied the question of species alternation.

Your task is to write an R script which calculates the coefficient of variation of stem diameter (`dbh`) for all trees (population coefficient of variation) and by species. Then go on and write a function which returns the coefficient of variation for any quantitative vector. Repeat the previous calculations using the new function and compare your results. Finally, calculate the height-diameter ratio (height (`height`) divided by stem diameter (`dbh`) considering that the former is

measured in metres and the latter in centimetres) and apply the calculation of the coefficients of variation to the h/d ratio.