Foundations in R

Derek H. Ogle

## Always First Command

> library(NCStats)

## Basic Mathematics

## Basic Vectors

> ( profs <- c("Derek","Young","Sharad") )

[1] "Derek" "Young" "Sharad"

> ( nums <- c(4,2,6,4,3) )

[1] 4 2 6 4 3

> ( heads <- c(TRUE, TRUE, FALSE, FALSE) )

[1] TRUE TRUE FALSE FALSE

> ls()

[1] "f" "fnm" "gt5" "heads" "iris"   
 [6] "need2render" "nums" "profs" "set" "setver"   
[11] "setver1" "ver\_and\_gt5" "ver\_or\_gt5"

> nums[3]

[1] 6

> profs[2]

[1] "Young"

> heads[1]

[1] TRUE

## Basic Data Frames

> setwd("C:/aaaWork/Web/GitHub/NCMTH107/lecture/HOs")  
> iris <- read.csv("Iris.csv")  
> str(iris)

'data.frame': 150 obs. of 5 variables:  
 $ seplen : int 50 46 46 51 55 48 52 49 44 50 ...  
 $ sepwid : int 33 34 36 33 35 31 34 36 32 35 ...  
 $ petlen : int 14 14 10 17 13 16 14 14 13 16 ...  
 $ petwid : int 2 3 2 5 2 2 2 1 2 6 ...  
 $ species: Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...

> headtail(iris) # NOT the entire data.frame

seplen sepwid petlen petwid species  
1 50 33 14 2 setosa  
2 46 34 14 3 setosa  
3 46 36 10 2 setosa  
148 57 25 50 20 virginica  
149 58 28 51 24 virginica  
150 63 33 60 25 virginica

> ls()

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## Working With Data Frames

> iris[2,]

seplen sepwid petlen petwid species  
2 46 34 14 3 setosa

> iris$seplen

[1] 50 46 46 51 55 48 52 49 44 50 44 47 48 51 48 50 50 43 58 51 49 51 50 46 57  
 [26] 50 54 52 55 49 54 50 44 47 46 51 50 49 54 54 51 48 48 45 57 51 54 51 52 53  
 [51] 65 62 59 61 60 56 57 63 70 64 61 55 54 58 55 50 67 56 58 60 57 57 49 56 57  
 [76] 66 52 60 50 55 58 62 59 60 67 63 56 63 61 64 51 57 61 56 69 55 55 66 68 67  
[101] 64 67 63 69 65 65 58 68 62 77 67 76 49 67 59 63 64 79 67 77 63 72 61 61 64  
[126] 62 77 63 58 72 71 64 60 63 77 60 69 74 56 73 67 65 69 72 65 64 68 57 58 63

> iris$seplen[3]

[1] 46

> iris[3,2]

[1] 36

> iris[c(1,3,5),]

seplen sepwid petlen petwid species  
1 50 33 14 2 setosa  
3 46 36 10 2 setosa  
5 55 35 13 2 setosa

## Filtering Data Frames

> set <- filterD(iris,species=="setosa")  
> str(set)

'data.frame': 50 obs. of 5 variables:  
 $ seplen : int 50 46 46 51 55 48 52 49 44 50 ...  
 $ sepwid : int 33 34 36 33 35 31 34 36 32 35 ...  
 $ petlen : int 14 14 10 17 13 16 14 14 13 16 ...  
 $ petwid : int 2 3 2 5 2 2 2 1 2 6 ...  
 $ species: Factor w/ 1 level "setosa": 1 1 1 1 1 1 1 1 1 1 ...

> gt5 <- filterD(iris,seplen>5)  
> headtail(gt5)

seplen sepwid petlen petwid species  
1 50 33 14 2 setosa  
2 46 34 14 3 setosa  
3 46 36 10 2 setosa  
148 57 25 50 20 virginica  
149 58 28 51 24 virginica  
150 63 33 60 25 virginica

> setver1 <- filterD(iris,species!="virginica")  
> str(setver1)

'data.frame': 100 obs. of 5 variables:  
 $ seplen : int 50 46 46 51 55 48 52 49 44 50 ...  
 $ sepwid : int 33 34 36 33 35 31 34 36 32 35 ...  
 $ petlen : int 14 14 10 17 13 16 14 14 13 16 ...  
 $ petwid : int 2 3 2 5 2 2 2 1 2 6 ...  
 $ species: Factor w/ 2 levels "setosa","versicolor": 1 1 1 1 1 1 1 1 1 1 ...

> setver <- filterD(iris,species %in% c("setosa","versicolor"))  
> str(setver)

'data.frame': 100 obs. of 5 variables:  
 $ seplen : int 50 46 46 51 55 48 52 49 44 50 ...  
 $ sepwid : int 33 34 36 33 35 31 34 36 32 35 ...  
 $ petlen : int 14 14 10 17 13 16 14 14 13 16 ...  
 $ petwid : int 2 3 2 5 2 2 2 1 2 6 ...  
 $ species: Factor w/ 2 levels "setosa","versicolor": 1 1 1 1 1 1 1 1 1 1 ...

> ver\_and\_gt5 <- filterD(iris,species=="versicolor",seplen>5)  
> headtail(ver\_and\_gt5)

seplen sepwid petlen petwid species  
1 65 28 46 15 versicolor  
2 62 22 45 15 versicolor  
3 59 32 48 18 versicolor  
48 66 30 44 14 versicolor  
49 68 28 48 14 versicolor  
50 67 30 50 17 versicolor

> ver\_or\_gt5 <- filterD(iris,species=="versicolor" | seplen>5)  
> headtail(ver\_or\_gt5)

seplen sepwid petlen petwid species  
1 50 33 14 2 setosa  
2 46 34 14 3 setosa  
3 46 36 10 2 setosa  
148 57 25 50 20 virginica  
149 58 28 51 24 virginica  
150 63 33 60 25 virginica

> ls()

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