General R

R Basics

Data Classes

-
- "hey" "I'm a string"
- TRUE FALSE not

Data Types

- `vector`
- `matrix`
- `data.frame`
- `array`

`nifti`

Initializing: vectors

- `c()`

```
v = c(1, 4, 3, 7, 8)
print(v)
```

```
[1] 1 4 3 7 8
```

-

```
w = 1:5
print(w)
```

```
[1] 1 2 3 4 5
```

Assignment

R = <-

```
w = 1:5
w <- 1:5
```

=

-
- $
  -
- can . _

Help

- ?

help

- c

```
?c
help(topic = "c")
```

- ?? help.search

```
??c
help.search(pattern = "c")
```

Some Details

- y Y
-
- #

::

package::function()

```
utils::help("c")
```

Initializing: matrices and arrays

- m

  -

```
m = matrix(1:12, nrow = 3)
print(m)
```

```
     [,1] [,2] [,3] [,4]
[1,]    1    4    7   10
[2,]    2    5    8   11
[3,]    3    6    9   12
```

- a

```
a = array(1:36, dim = c(3, 4, 3))
```

- dim()

```
dim(a)
```

```
[1] 3 4 3
```

Subsetting: vectors

. 1

```
print(v)
```

```
[1] 1 4 3 7 8
```

```
print(v[4])
```

```
[1] 7
```

```
print(v[1:3])
```

```
[1] 1 4 3
```

```
print(v[c(1,3,5)])
```

```
[1] 1 3 8
```

Subsetting: matrices

- [row,column]

```
print(m[1,3])
```

```
[1] 7
```

```
print(m[1:2,3:4])
```

```
     [,1] [,2]
[1,]    7   10
[2,]    8   11
```

- row column

```
print(m[,4])
```

```
[1] 10 11 12
```

```
print(m[2,])
```

```
[1]  2  5  8 11
```

Subsetting: arrays

- [x,y,z]

```
print(a[1,1,1])
```

```
[1] 1
```

```
dim(a[,4,])
```

```
[1] 3 3
```

```
a[,4]
```

Operators in R: return numeric

- `+ - * / ^`
- `log abs sqrt`

```
print(v); print(w)
```

```
[1] 1 4 3 7 8
```

```
[1] 1 2 3 4 5
```

```
print(v + 4)
```

```
[1]  5  8  7 11 12
```

```
print(v + w)
```

```
[1]  2  6  6 11 13
```

```
print(sqrt(w^2))
```

```
[1] 1 2 3 4 5
```

Operators in R: return logical

- > >= < <= == !=
- ! & |
- all() TRUE any()

```
print(!FALSE)
```

```
[1] TRUE
```

```
print(TRUE | FALSE)
```

```
[1] TRUE
```

```
print(FALSE & FALSE)
```

```
[1] FALSE
```

```
c(all(c(TRUE, FALSE)), any(c(TRUE, FALSE)))
```

```
[1] FALSE  TRUE
```

Subsetting with logicals

`which` `TRUE`

```
which(v > 5)
```

```
[1] 4 5
```

```
v[ which(v > 5) ]
```

```
[1] 7 8
```

```
v[ v > 5 ]
```

```
[1] 7 8
```

Website