

Intro to R: Lab 1-walkthrough

Simon Caton

Use help, to see what the rnorm function does.

```
?rnorm
```

Have a go using some of these functions

```
x <- c(10.4, 5.6, 3.1, 6.4, 21.7)
```

```
x + 1
```

```
## [1] 11.4 6.6 4.1 7.4 22.7
```

```
x - 1
```

```
## [1] 9.4 4.6 2.1 5.4 20.7
```

```
x * 2
```

```
## [1] 20.8 11.2 6.2 12.8 43.4
```

```
x / 2
```

```
## [1] 5.20 2.80 1.55 3.20 10.85
```

```
log(x)
```

```
## [1] 2.341806 1.722767 1.131402 1.856298 3.077312
```

```
sqrt(x)
```

```
## [1] 3.224903 2.366432 1.760682 2.529822 4.658326
```

```
exp(x)
```

```
## [1] 3.285963e+04 2.704264e+02 2.219795e+01 6.018450e+02 2.655769e+09
```

```
sin(x)
```

```
## [1] -0.82782647 -0.63126664 0.04158066 0.11654920 0.28705265
```

etc.

Identify the values of x between 3 and 7

```
x > 3 & x < 7
```

```
## [1] FALSE TRUE TRUE TRUE FALSE
```

Or, if you want the actual values (here we use an index, as introduced on page 4):

```
x[x > 3 & x < 7]
```

```
## [1] 5.6 3.1 6.4
```

Identify which values of x are greater than the mean of x

```
m <- mean(x)
x[x > m]
```

```
## [1] 10.4 21.7
```

Or

```
x[x > mean(x)]
```

```
## [1] 10.4 21.7
```

Identify which values of x are more than 1 standard deviation from the mean of x.

```
s <- sd(x)
x[x < (m - s) | x > (m + s)]
```

```
## [1] 21.7
```

Try it on the vector z produced above

```
z <- c(1:3,NA)
z == NA
```

```
## [1] NA NA NA NA
```

Check the contents of lunch.

```
fruit <- c(5, 10, 1, 20)
names(fruit) <- c("orange", "banana", "apple", "peach")
lunch <- fruit[c("apple","orange")]
print(lunch)
```

```
## apple orange
##      1      5
```

Instead of replacing NAs with 0 replace them instead with the mean of x. Note you will need to reassign the original values to x, as right now the NAs are 0s.

```
x <- c(-5:-1, NA, NA, 1:3)
m <- mean(x)
print(m) #missing values interfere with the computation of the mean

## [1] NA

x[is.na(x)] <- mean(x, na.rm=TRUE) #so we need to remove them
print(x)

## [1] -5.000 -4.000 -3.000 -2.000 -1.000 -1.125 -1.125  1.000  2.000  3.000
```

Remember that an operation on an NA results in an NA.