Class4-Intro-to-R.R

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```
# Simple Calculations
5 + 3
```

```
## [1] 8
```

```
5 - 3
```

```
## [1] 2
```

```
5 * 3
```

```
## [1] 15
```

```
5 / 3
```

```
## [1] 1.666667
```

```
# Saving your answers - object assignment
x <- 12
this_is_a_really_long_name <- 2.5
r_rocks <- 2 ^ 3

# Calling Functions
seq(1,10)
```

```
##  [1]  1  2  3  4  5  6  7  8  9 10
```

```
seq(1,10, by = 2)
```

```
## [1] 1 3 5 7 9
```

```
?seq
date()
```

```
## [1] "Sat Oct  8 02:01:18 2022"
```

```r
# Getting help in R
help(log)
??"cross tabulate"
log(exp(3))
```

```
## [1] 3
```

```r
example(log)
```

```
##
## log> log(exp(3))
## [1] 3
##
## log> log10(1e7) # = 7
## [1] 7
##
## log> x <- 10^-(1+2*1:9)
##
## log> cbind(x, log(1+x), log1p(x), exp(x)-1, expm1(x))
##           x
##  [1,] 1e-03 9.995003e-04 9.995003e-04 1.000500e-03 1.000500e-03
##  [2,] 1e-05 9.999950e-06 9.999950e-06 1.000005e-05 1.000005e-05
##  [3,] 1e-07 1.000000e-07 1.000000e-07 1.000000e-07 1.000000e-07
##  [4,] 1e-09 1.000000e-09 1.000000e-09 1.000000e-09 1.000000e-09
##  [5,] 1e-11 1.000000e-11 1.000000e-11 1.000000e-11 1.000000e-11
##  [6,] 1e-13 9.992007e-14 1.000000e-13 9.992007e-14 1.000000e-13
##  [7,] 1e-15 1.110223e-15 1.000000e-15 1.110223e-15 1.000000e-15
##  [8,] 1e-17 0.000000e+00 1.000000e-17 0.000000e+00 1.000000e-17
##  [9,] 1e-19 0.000000e+00 1.000000e-19 0.000000e+00 1.000000e-19
```

```r
# Vectors, Vectorization, and Indexing
length(3.1)
```

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

```r
x <- c(56, 95.3, 0.4)
y <- c(3.2, 1.1, 0.2)
x + y
```

```
## [1] 59.2 96.4  0.6
```

```r
x - y
```

```
## [1] 52.8 94.2  0.2
```

```r
x / y
```

```
## [1] 17.50000 86.63636  2.00000
```

```r
sqrt(x)
```

```
## [1] 7.4833148 9.7621719 0.6324555
```

```r
round(sqrt(x), 3)
```

```
## [1] 7.483 9.762 0.632
```

```r
log(x) / 2 + 1
```

```
## [1] 3.0126758 3.2785149 0.5418546
```

```r
x <- c(56, 95.3, 0.4)
x[2]
```

```
## [1] 95.3
```

```r
x[1]
```

```
## [1] 56
```

```r
x[4]
```

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

```r
x[3] <- 0.5
x
```

```
## [1] 56.0 95.3  0.5
```

```r
x <- 1:4
x + c(100, 1)
```

```
## [1] 101   3 103   5
```

```r
x
```

```
## [1] 1 2 3 4
```

```r
y <- c("Barry", "alice", "chandra", "eva")
names(x) <- y

z <- c("Barry", "alice", "chandra", "eva", 100)

x <- c(T, F, T, T, F)
sum(x)
```

```
## [1] 3
```

```r
grades <- c(6, 10, 9, 8)
sum(grades > 7)
```

```
## [1] 3
```

```r
x <- 1:5.1

#Miscellaneous points
rm(list = ls())

#Reproducibility and sessionInfo()
sessionInfo()
```

```
## R version 4.2.1 (2022-06-23)
## Platform: x86_64-apple-darwin17.0 (64-bit)
## Running under: macOS Big Sur ... 10.16
##
## Matrix products: default
## BLAS:   /Library/Frameworks/R.framework/Versions/4.2/Resources/lib/libRblas.0.dylib
## LAPACK: /Library/Frameworks/R.framework/Versions/4.2/Resources/lib/libRlapack.dylib
##
## locale:
## [1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## loaded via a namespace (and not attached):
##  [1] compiler_4.2.1  magrittr_2.0.3  fastmap_1.1.0   tools_4.2.1
##  [5] htmltools_0.5.3 yaml_2.3.5      stringi_1.7.8   rmarkdown_2.16
##  [9] highr_0.9       knitr_1.40      stringr_1.4.1   xfun_0.33
## [13] digest_0.6.29   rlang_1.0.6     evaluate_0.17
```

```r
#Extra
1:10 * 10
```

```
##  [1]  10  20  30  40  50  60  70  80  90 100
```

```r
x <- 1:10
x[-1]
```

```
## [1]  2  3  4  5  6  7  8  9 10
```

```r
letters
```

```
##  [1] "a" "b" "c" "d" "e" "f" "g" "h" "i" "j" "k" "l" "m" "n" "o" "p" "q" "r" "s"
## [20] "t" "u" "v" "w" "x" "y" "z"
```

```r
letters[1:5]
```

```
## [1] "a" "b" "c" "d" "e"
```

```r
df <- data.frame(nums = 1:5, chars = letters[1:5], logical = c(T, T, F, T, F))
df <- data.frame(nums = 1:5, chars = letters[1:5], logical = c(T))
df[1,]
```

```
##   nums chars logical
## 1    1     a    TRUE
```

```r
df[,3]
```

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

```r
df[,"nums"]
```

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

```r
df[3, 2]
```

```
## [1] "c"
```

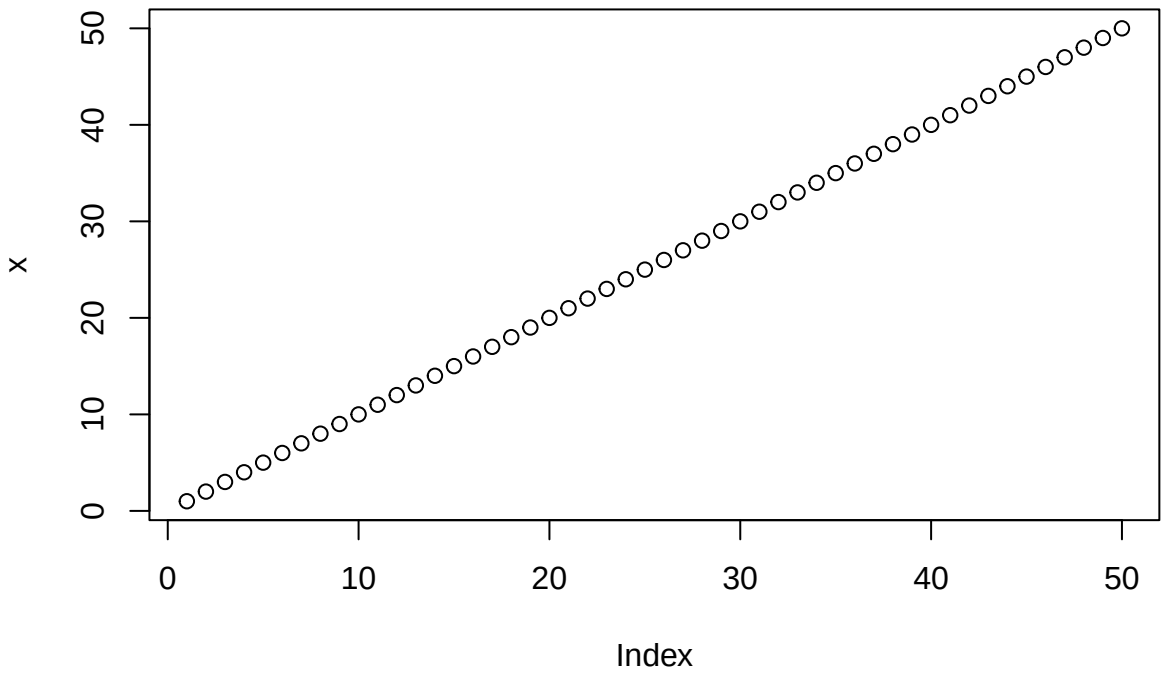
```r
df[df$nums > 3,]
```

```
##   nums chars logical
## 4    4     d    TRUE
## 5    5     e    TRUE
```

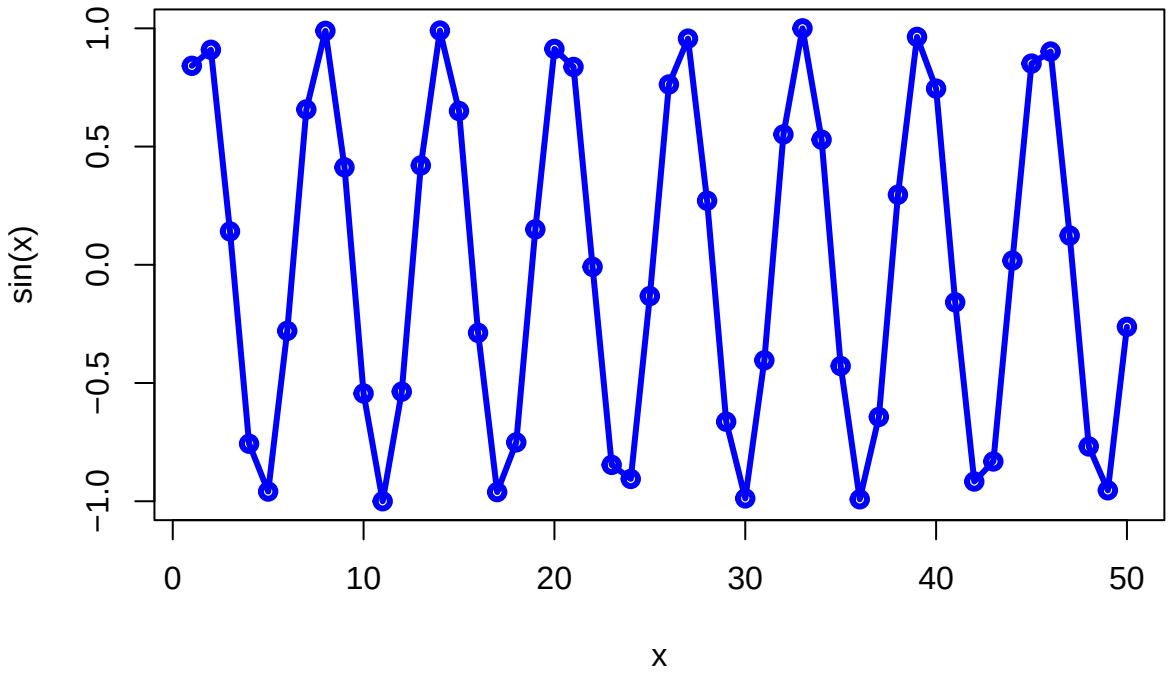
```r
df[,0]
```

```
## data frame with 0 columns and 5 rows
```

```r
x <- 1:50
plot(x)
```




```
plot(x, sin(x), type="o", col="blue", lwd = "3")
```


sin(x)
1.0
0.5
0.0
−0.5
−1.0
0
10
20
30
40
50
x