wrangle

Hans

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library(tidyverse)

## ── Attaching packages ───────────────────────────────────────────────────────────────────────────────────── tidyverse 1.2.1 ──

## ✔ ggplot2 3.2.1 ✔ purrr 0.3.2  
## ✔ tibble 2.1.3 ✔ dplyr 0.8.3  
## ✔ tidyr 0.8.3 ✔ stringr 1.4.0  
## ✔ readr 1.3.1 ✔ forcats 0.4.0

## ── Conflicts ──────────────────────────────────────────────────────────────────────────────────────── tidyverse\_conflicts() ──  
## ✖ dplyr::filter() masks stats::filter()  
## ✖ dplyr::lag() masks stats::lag()

# Data frame

# stringsAsFactors=FALSE is used to prevenbt the automatic creatuiib of factors  
# For 'sex' you want it, so there you specify it explicitly  
mydata <- data.frame(person=c("Peter","Lois","Meg","Chris","Stewie"),  
 age=c(42,40,17,14,1),  
 sex=factor(c("M","F","F","M","M")),   
 stringsAsFactors = FALSE)  
mydata

## person age sex  
## 1 Peter 42 M  
## 2 Lois 40 F  
## 3 Meg 17 F  
## 4 Chris 14 M  
## 5 Stewie 1 M

mydata$age

## [1] 42 40 17 14 1

mydata$sex

## [1] M F F M M  
## Levels: F M

mydata$person

## [1] "Peter" "Lois" "Meg" "Chris" "Stewie"

# Tibble

Excerpt From: Tilman M. Davies. “The Book of R”. Apple Books.

head(iris,15)

## Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 1 5.1 3.5 1.4 0.2 setosa  
## 2 4.9 3.0 1.4 0.2 setosa  
## 3 4.7 3.2 1.3 0.2 setosa  
## 4 4.6 3.1 1.5 0.2 setosa  
## 5 5.0 3.6 1.4 0.2 setosa  
## 6 5.4 3.9 1.7 0.4 setosa  
## 7 4.6 3.4 1.4 0.3 setosa  
## 8 5.0 3.4 1.5 0.2 setosa  
## 9 4.4 2.9 1.4 0.2 setosa  
## 10 4.9 3.1 1.5 0.1 setosa  
## 11 5.4 3.7 1.5 0.2 setosa  
## 12 4.8 3.4 1.6 0.2 setosa  
## 13 4.8 3.0 1.4 0.1 setosa  
## 14 4.3 3.0 1.1 0.1 setosa  
## 15 5.8 4.0 1.2 0.2 setosa

tib\_iris <- as\_tibble(iris)

tibble(  
 x = 1:10,  
 y = 1,  
 z = x^2 +y  
)

## # A tibble: 10 x 3  
## x y z  
## <int> <dbl> <dbl>  
## 1 1 1 2  
## 2 2 1 5  
## 3 3 1 10  
## 4 4 1 17  
## 5 5 1 26  
## 6 6 1 37  
## 7 7 1 50  
## 8 8 1 65  
## 9 9 1 82  
## 10 10 1 101

tribble( ~x, ~y, ~z, “a”, 2, 3.6, “b”, 1, 8.5)

tibble(  
 a = lubridate::now() + runif(1e3) \* 86400,  
 b = lubridate::today() + runif(1e3) \* 30,  
 c = 1:1e3,  
 d = runif(1e3),  
 e = sample(letters, 1e3, replace = TRUE) )

## # A tibble: 1,000 x 5  
## a b c d e   
## <dttm> <date> <int> <dbl> <chr>  
## 1 2019-09-09 00:07:11 2019-10-07 1 0.874 e   
## 2 2019-09-09 02:00:17 2019-10-06 2 0.239 a   
## 3 2019-09-09 00:53:24 2019-10-07 3 0.496 m   
## 4 2019-09-09 06:25:29 2019-09-12 4 0.894 f   
## 5 2019-09-08 17:56:13 2019-10-07 5 0.225 j   
## 6 2019-09-09 08:23:55 2019-09-11 6 0.425 p   
## 7 2019-09-09 09:59:59 2019-09-12 7 0.437 u   
## 8 2019-09-09 09:44:54 2019-10-06 8 0.950 d   
## 9 2019-09-08 21:13:22 2019-09-17 9 0.972 e   
## 10 2019-09-09 15:58:19 2019-09-11 10 0.949 m   
## # … with 990 more rows

df <- tibble(  
 x = runif(5),  
 y = runif(5)  
)  
  
df

## # A tibble: 5 x 2  
## x y  
## <dbl> <dbl>  
## 1 0.674 0.500   
## 2 0.142 0.0984  
## 3 0.826 0.710   
## 4 0.319 0.822   
## 5 0.148 0.322

df$x

## [1] 0.6738459 0.1417688 0.8255475 0.3194816 0.1475053

df[["x"]]

## [1] 0.6738459 0.1417688 0.8255475 0.3194816 0.1475053

df[[1]]

## [1] 0.6738459 0.1417688 0.8255475 0.3194816 0.1475053

Loop over the columns in tibble

df <- tibble(  
 a = rnorm(10),  
 b = rnorm(10),  
 c = rnorm(10),  
 d = rnorm(10)  
)  
  
# Create an empty vector to hold the data  
output <- vector("double", ncol(df))  
  
# Then loop  
for ( i in seq\_along(df)) {  
 output[[i]]= median(df[[i]])   
}  
output

## [1] 0.77705890 0.05553074 -0.14525859 -0.04736672

#install.packages('nycflights13')  
library(dplyr)  
library(nycflights13)  
  
# Remove the flights that were cancelled   
not\_cancelled <- flights %>% filter(!is.na(dep\_delay), !is.na(arr\_delay))  
not\_cancelled

## # A tibble: 327,346 x 19  
## year month day dep\_time sched\_dep\_time dep\_delay arr\_time  
## <int> <int> <int> <int> <int> <dbl> <int>  
## 1 2013 1 1 517 515 2 830  
## 2 2013 1 1 533 529 4 850  
## 3 2013 1 1 542 540 2 923  
## 4 2013 1 1 544 545 -1 1004  
## 5 2013 1 1 554 600 -6 812  
## 6 2013 1 1 554 558 -4 740  
## 7 2013 1 1 555 600 -5 913  
## 8 2013 1 1 557 600 -3 709  
## 9 2013 1 1 557 600 -3 838  
## 10 2013 1 1 558 600 -2 753  
## # … with 327,336 more rows, and 12 more variables: sched\_arr\_time <int>,  
## # arr\_delay <dbl>, carrier <chr>, flight <int>, tailnum <chr>,  
## # origin <chr>, dest <chr>, air\_time <dbl>, distance <dbl>, hour <dbl>,  
## # minute <dbl>, time\_hour <dttm>

#Get the average delay of all flights for each day  
(avdelay <- not\_cancelled %>%   
 group\_by(year, month, day) %>%   
 summarise(mean = mean(dep\_delay)))

## # A tibble: 365 x 4  
## # Groups: year, month [12]  
## year month day mean  
## <int> <int> <int> <dbl>  
## 1 2013 1 1 11.4   
## 2 2013 1 2 13.7   
## 3 2013 1 3 10.9   
## 4 2013 1 4 8.97  
## 5 2013 1 5 5.73  
## 6 2013 1 6 7.15  
## 7 2013 1 7 5.42  
## 8 2013 1 8 2.56  
## 9 2013 1 9 2.30  
## 10 2013 1 10 2.84  
## # … with 355 more rows

avdelay

## # A tibble: 365 x 4  
## # Groups: year, month [12]  
## year month day mean  
## <int> <int> <int> <dbl>  
## 1 2013 1 1 11.4   
## 2 2013 1 2 13.7   
## 3 2013 1 3 10.9   
## 4 2013 1 4 8.97  
## 5 2013 1 5 5.73  
## 6 2013 1 6 7.15  
## 7 2013 1 7 5.42  
## 8 2013 1 8 2.56  
## 9 2013 1 9 2.30  
## 10 2013 1 10 2.84  
## # … with 355 more rows

# ggplot(data = avdelay) +  
# geom\_point(mapping = aes(x = year, y = mean))

# Detect outlier

library (dslabs)  
  
# The data set contains a big outlier  
outlier\_example

## [1] 5.59 5.80 5.54 6.15 5.83 5.54 5.87 5.93 5.89 5.67  
## [11] 6.13 5.85 5.59 5.20 6.03 5.74 5.75 5.99 5.96 5.90  
## [21] 5.98 5.95 5.77 5.25 5.90 5.74 5.71 5.38 5.63 5.85  
## [31] 6.09 5.72 5.85 5.74 5.41 5.65 5.65 5.74 6.03 5.94  
## [41] 5.71 5.69 5.92 5.89 5.58 5.57 5.84 5.94 5.72 5.97  
## [51] 5.85 5.60 5.84 5.47 6.11 6.25 5.66 5.49 5.89 5.72  
## [61] 6.35 5.74 5.92 5.76 5.56 5.80 5.30 6.12 5.79 6.29  
## [71] 5.87 5.57 5.90 5.52 5.44 5.82 5.64 5.75 5.77 5.60  
## [81] 5.61 5.72 6.04 5.37 5.90 5.83 6.02 5.67 5.84 5.82  
## [91] 5.61 6.05 6.04 5.93 6.15 5.89 5.43 5.61 5.44 5.63  
## [101] 5.59 5.76 5.52 5.79 5.59 6.19 5.93 5.98 5.85 6.17  
## [111] 5.59 5.63 6.11 5.59 5.70 5.65 5.67 5.68 5.87 5.71  
## [121] 5.62 6.09 5.70 5.71 5.72 5.93 5.73 5.74 5.58 5.67  
## [131] 5.77 5.60 5.88 5.37 5.83 5.37 5.67 5.62 5.59 5.74  
## [141] 5.27 6.04 5.33 5.63 5.47 5.56 6.27 5.75 5.43 5.34  
## [151] 5.86 5.75 5.67 5.52 5.38 5.48 6.00 5.59 5.40 6.22  
## [161] 5.86 5.69 6.01 5.97 5.60 6.30 5.69 5.39 5.71 5.80  
## [171] 6.33 5.78 5.86 5.73 5.67 5.74 5.95 6.27 6.01 6.05  
## [181] 5.44 6.00 5.80 5.38 5.88 5.71 6.12 5.56 5.64 5.52  
## [191] 5.71 5.85 5.57 5.96 5.45 5.49 6.11 5.50 5.85 5.65  
## [201] 5.85 6.17 6.15 5.67 5.18 6.37 5.92 5.89 5.75 5.88  
## [211] 5.71 5.86 5.65 5.41 6.00 6.13 5.67 5.44 180.00 5.74  
## [221] 5.32 5.75 5.59 5.66 5.46 6.20 5.67 5.35 5.80 5.82  
## [231] 5.50 5.03 5.59 5.89 5.74 5.73 5.89 5.45 6.02 5.75  
## [241] 5.93 6.01 5.81 5.53 6.04 5.25 5.61 5.69 5.71 6.01  
## [251] 5.78 5.85 5.73 5.69 5.92 6.04 5.15 5.89 5.84 5.64  
## [261] 5.99 5.65 5.68 5.96 6.18 5.82 5.64 5.45 5.67 5.52  
## [271] 5.69 5.85 5.54 6.41 5.79 6.03 5.18 5.94 5.42 5.98  
## [281] 5.85 5.65 6.08 5.57 5.60 5.50 5.58 5.99 5.86 6.00  
## [291] 5.65 5.84 5.81 5.39 6.19 5.78 5.94 5.99 5.74 5.67  
## [301] 5.97 5.49 6.24 5.65 6.16 6.13 5.77 5.89 5.49 5.83  
## [311] 6.01 5.77 5.64 5.59 5.74 6.02 5.63 5.72 5.43 5.87  
## [321] 6.08 6.12 5.95 5.28 5.87 5.86 5.66 5.79 5.53 5.92  
## [331] 5.67 5.36 5.66 6.09 5.67 5.93 5.99 5.75 5.66 5.62  
## [341] 5.93 5.48 5.81 5.68 5.18 5.40 5.98 5.70 5.95 6.22  
## [351] 6.12 5.92 5.84 5.70 6.14 5.90 5.46 5.71 5.27 5.70  
## [361] 5.10 6.08 5.59 5.64 5.71 5.90 5.92 5.89 5.61 5.41  
## [371] 5.65 5.82 5.54 5.73 5.46 5.75 5.78 5.71 5.71 6.19  
## [381] 5.94 6.03 5.52 5.79 6.04 5.74 5.22 5.84 5.27 5.55  
## [391] 6.08 5.90 6.02 5.83 5.72 5.52 6.15 5.76 5.57 5.97  
## [401] 6.02 6.22 5.60 5.65 5.65 5.66 5.66 5.68 6.11 5.58  
## [411] 5.65 5.91 6.03 5.56 5.62 5.88 6.00 5.69 5.39 6.18  
## [421] 6.11 5.57 5.73 5.31 5.89 6.15 5.34 5.56 5.59 5.58  
## [431] 5.24 5.88 5.37 5.74 5.90 5.70 5.97 5.74 5.59 5.91  
## [441] 5.64 6.19 5.75 5.96 5.80 5.00 5.41 5.64 5.81 5.16  
## [451] 5.99 5.60 5.56 5.36 5.39 5.76 5.88 5.23 5.50 5.88  
## [461] 5.64 6.29 6.06 5.90 5.75 5.82 5.57 5.91 6.12 6.02  
## [471] 5.55 5.35 5.72 5.86 6.09 5.42 5.84 5.81 6.05 5.74  
## [481] 5.66 5.46 5.62 5.66 6.34 6.36 5.71 5.49 5.26 5.88  
## [491] 5.48 6.32 5.53 5.78 6.70 5.47 5.83 5.47 5.84 5.53

# You can see that because mean and median differ a lot  
mean(outlier\_example)

## [1] 6.10382

median(outlier\_example)

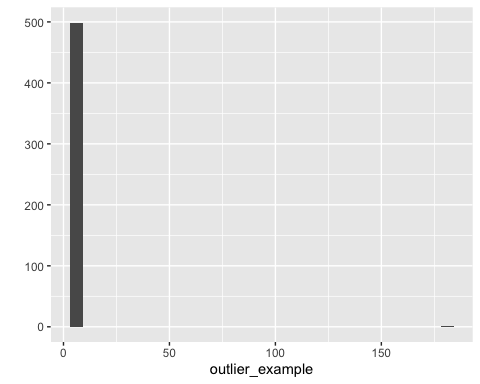
## [1] 5.74

# You can see that also because sd is large  
sd(outlier\_example)

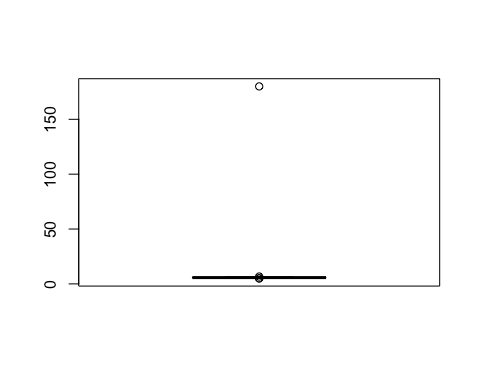
## [1] 7.796558

# You can see that also in the histogram  
qplot(outlier\_example)

## `stat\_bin()` using `bins = 30`. Pick better value with `binwidth`.



# You can see that also in the boxplot  
boxplot(outlier\_example)



# See if there are values > 8. See! There is one 180   
outlier\_example[outlier\_example > 8]

## [1] 180

# At what index des it sit?  
which(outlier\_example > 8)

## [1] 219

# Remove it form the dataset  
oe <- outlier\_example[-which(outlier\_example>8)]  
mean(oe)

## [1] 5.755331

median(oe)

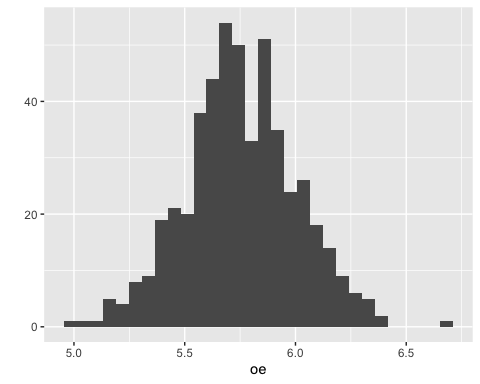
## [1] 5.74

sd(oe)

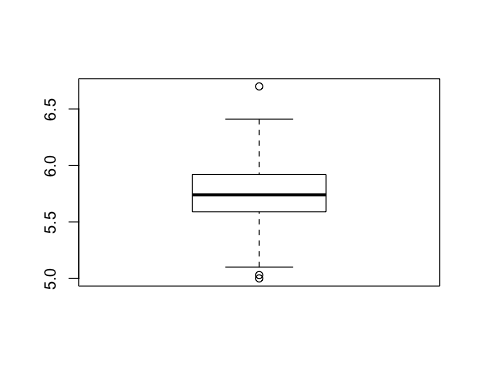
## [1] 0.2530434

qplot(oe)

## `stat\_bin()` using `bins = 30`. Pick better value with `binwidth`.



boxplot(oe)



# Select

dslab

iris

## Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 1 5.1 3.5 1.4 0.2 setosa  
## 2 4.9 3.0 1.4 0.2 setosa  
## 3 4.7 3.2 1.3 0.2 setosa  
## 4 4.6 3.1 1.5 0.2 setosa  
## 5 5.0 3.6 1.4 0.2 setosa  
## 6 5.4 3.9 1.7 0.4 setosa  
## 7 4.6 3.4 1.4 0.3 setosa  
## 8 5.0 3.4 1.5 0.2 setosa  
## 9 4.4 2.9 1.4 0.2 setosa  
## 10 4.9 3.1 1.5 0.1 setosa  
## 11 5.4 3.7 1.5 0.2 setosa  
## 12 4.8 3.4 1.6 0.2 setosa  
## 13 4.8 3.0 1.4 0.1 setosa  
## 14 4.3 3.0 1.1 0.1 setosa  
## 15 5.8 4.0 1.2 0.2 setosa  
## 16 5.7 4.4 1.5 0.4 setosa  
## 17 5.4 3.9 1.3 0.4 setosa  
## 18 5.1 3.5 1.4 0.3 setosa  
## 19 5.7 3.8 1.7 0.3 setosa  
## 20 5.1 3.8 1.5 0.3 setosa  
## 21 5.4 3.4 1.7 0.2 setosa  
## 22 5.1 3.7 1.5 0.4 setosa  
## 23 4.6 3.6 1.0 0.2 setosa  
## 24 5.1 3.3 1.7 0.5 setosa  
## 25 4.8 3.4 1.9 0.2 setosa  
## 26 5.0 3.0 1.6 0.2 setosa  
## 27 5.0 3.4 1.6 0.4 setosa  
## 28 5.2 3.5 1.5 0.2 setosa  
## 29 5.2 3.4 1.4 0.2 setosa  
## 30 4.7 3.2 1.6 0.2 setosa  
## 31 4.8 3.1 1.6 0.2 setosa  
## 32 5.4 3.4 1.5 0.4 setosa  
## 33 5.2 4.1 1.5 0.1 setosa  
## 34 5.5 4.2 1.4 0.2 setosa  
## 35 4.9 3.1 1.5 0.2 setosa  
## 36 5.0 3.2 1.2 0.2 setosa  
## 37 5.5 3.5 1.3 0.2 setosa  
## 38 4.9 3.6 1.4 0.1 setosa  
## 39 4.4 3.0 1.3 0.2 setosa  
## 40 5.1 3.4 1.5 0.2 setosa  
## 41 5.0 3.5 1.3 0.3 setosa  
## 42 4.5 2.3 1.3 0.3 setosa  
## 43 4.4 3.2 1.3 0.2 setosa  
## 44 5.0 3.5 1.6 0.6 setosa  
## 45 5.1 3.8 1.9 0.4 setosa  
## 46 4.8 3.0 1.4 0.3 setosa  
## 47 5.1 3.8 1.6 0.2 setosa  
## 48 4.6 3.2 1.4 0.2 setosa  
## 49 5.3 3.7 1.5 0.2 setosa  
## 50 5.0 3.3 1.4 0.2 setosa  
## 51 7.0 3.2 4.7 1.4 versicolor  
## 52 6.4 3.2 4.5 1.5 versicolor  
## 53 6.9 3.1 4.9 1.5 versicolor  
## 54 5.5 2.3 4.0 1.3 versicolor  
## 55 6.5 2.8 4.6 1.5 versicolor  
## 56 5.7 2.8 4.5 1.3 versicolor  
## 57 6.3 3.3 4.7 1.6 versicolor  
## 58 4.9 2.4 3.3 1.0 versicolor  
## 59 6.6 2.9 4.6 1.3 versicolor  
## 60 5.2 2.7 3.9 1.4 versicolor  
## 61 5.0 2.0 3.5 1.0 versicolor  
## 62 5.9 3.0 4.2 1.5 versicolor  
## 63 6.0 2.2 4.0 1.0 versicolor  
## 64 6.1 2.9 4.7 1.4 versicolor  
## 65 5.6 2.9 3.6 1.3 versicolor  
## 66 6.7 3.1 4.4 1.4 versicolor  
## 67 5.6 3.0 4.5 1.5 versicolor  
## 68 5.8 2.7 4.1 1.0 versicolor  
## 69 6.2 2.2 4.5 1.5 versicolor  
## 70 5.6 2.5 3.9 1.1 versicolor  
## 71 5.9 3.2 4.8 1.8 versicolor  
## 72 6.1 2.8 4.0 1.3 versicolor  
## 73 6.3 2.5 4.9 1.5 versicolor  
## 74 6.1 2.8 4.7 1.2 versicolor  
## 75 6.4 2.9 4.3 1.3 versicolor  
## 76 6.6 3.0 4.4 1.4 versicolor  
## 77 6.8 2.8 4.8 1.4 versicolor  
## 78 6.7 3.0 5.0 1.7 versicolor  
## 79 6.0 2.9 4.5 1.5 versicolor  
## 80 5.7 2.6 3.5 1.0 versicolor  
## 81 5.5 2.4 3.8 1.1 versicolor  
## 82 5.5 2.4 3.7 1.0 versicolor  
## 83 5.8 2.7 3.9 1.2 versicolor  
## 84 6.0 2.7 5.1 1.6 versicolor  
## 85 5.4 3.0 4.5 1.5 versicolor  
## 86 6.0 3.4 4.5 1.6 versicolor  
## 87 6.7 3.1 4.7 1.5 versicolor  
## 88 6.3 2.3 4.4 1.3 versicolor  
## 89 5.6 3.0 4.1 1.3 versicolor  
## 90 5.5 2.5 4.0 1.3 versicolor  
## 91 5.5 2.6 4.4 1.2 versicolor  
## 92 6.1 3.0 4.6 1.4 versicolor  
## 93 5.8 2.6 4.0 1.2 versicolor  
## 94 5.0 2.3 3.3 1.0 versicolor  
## 95 5.6 2.7 4.2 1.3 versicolor  
## 96 5.7 3.0 4.2 1.2 versicolor  
## 97 5.7 2.9 4.2 1.3 versicolor  
## 98 6.2 2.9 4.3 1.3 versicolor  
## 99 5.1 2.5 3.0 1.1 versicolor  
## 100 5.7 2.8 4.1 1.3 versicolor  
## 101 6.3 3.3 6.0 2.5 virginica  
## 102 5.8 2.7 5.1 1.9 virginica  
## 103 7.1 3.0 5.9 2.1 virginica  
## 104 6.3 2.9 5.6 1.8 virginica  
## 105 6.5 3.0 5.8 2.2 virginica  
## 106 7.6 3.0 6.6 2.1 virginica  
## 107 4.9 2.5 4.5 1.7 virginica  
## 108 7.3 2.9 6.3 1.8 virginica  
## 109 6.7 2.5 5.8 1.8 virginica  
## 110 7.2 3.6 6.1 2.5 virginica  
## 111 6.5 3.2 5.1 2.0 virginica  
## 112 6.4 2.7 5.3 1.9 virginica  
## 113 6.8 3.0 5.5 2.1 virginica  
## 114 5.7 2.5 5.0 2.0 virginica  
## 115 5.8 2.8 5.1 2.4 virginica  
## 116 6.4 3.2 5.3 2.3 virginica  
## 117 6.5 3.0 5.5 1.8 virginica  
## 118 7.7 3.8 6.7 2.2 virginica  
## 119 7.7 2.6 6.9 2.3 virginica  
## 120 6.0 2.2 5.0 1.5 virginica  
## 121 6.9 3.2 5.7 2.3 virginica  
## 122 5.6 2.8 4.9 2.0 virginica  
## 123 7.7 2.8 6.7 2.0 virginica  
## 124 6.3 2.7 4.9 1.8 virginica  
## 125 6.7 3.3 5.7 2.1 virginica  
## 126 7.2 3.2 6.0 1.8 virginica  
## 127 6.2 2.8 4.8 1.8 virginica  
## 128 6.1 3.0 4.9 1.8 virginica  
## 129 6.4 2.8 5.6 2.1 virginica  
## 130 7.2 3.0 5.8 1.6 virginica  
## 131 7.4 2.8 6.1 1.9 virginica  
## 132 7.9 3.8 6.4 2.0 virginica  
## 133 6.4 2.8 5.6 2.2 virginica  
## 134 6.3 2.8 5.1 1.5 virginica  
## 135 6.1 2.6 5.6 1.4 virginica  
## 136 7.7 3.0 6.1 2.3 virginica  
## 137 6.3 3.4 5.6 2.4 virginica  
## 138 6.4 3.1 5.5 1.8 virginica  
## 139 6.0 3.0 4.8 1.8 virginica  
## 140 6.9 3.1 5.4 2.1 virginica  
## 141 6.7 3.1 5.6 2.4 virginica  
## 142 6.9 3.1 5.1 2.3 virginica  
## 143 5.8 2.7 5.1 1.9 virginica  
## 144 6.8 3.2 5.9 2.3 virginica  
## 145 6.7 3.3 5.7 2.5 virginica  
## 146 6.7 3.0 5.2 2.3 virginica  
## 147 6.3 2.5 5.0 1.9 virginica  
## 148 6.5 3.0 5.2 2.0 virginica  
## 149 6.2 3.4 5.4 2.3 virginica  
## 150 5.9 3.0 5.1 1.8 virginica

select(iris, starts\_with("Petal"))

## Petal.Length Petal.Width  
## 1 1.4 0.2  
## 2 1.4 0.2  
## 3 1.3 0.2  
## 4 1.5 0.2  
## 5 1.4 0.2  
## 6 1.7 0.4  
## 7 1.4 0.3  
## 8 1.5 0.2  
## 9 1.4 0.2  
## 10 1.5 0.1  
## 11 1.5 0.2  
## 12 1.6 0.2  
## 13 1.4 0.1  
## 14 1.1 0.1  
## 15 1.2 0.2  
## 16 1.5 0.4  
## 17 1.3 0.4  
## 18 1.4 0.3  
## 19 1.7 0.3  
## 20 1.5 0.3  
## 21 1.7 0.2  
## 22 1.5 0.4  
## 23 1.0 0.2  
## 24 1.7 0.5  
## 25 1.9 0.2  
## 26 1.6 0.2  
## 27 1.6 0.4  
## 28 1.5 0.2  
## 29 1.4 0.2  
## 30 1.6 0.2  
## 31 1.6 0.2  
## 32 1.5 0.4  
## 33 1.5 0.1  
## 34 1.4 0.2  
## 35 1.5 0.2  
## 36 1.2 0.2  
## 37 1.3 0.2  
## 38 1.4 0.1  
## 39 1.3 0.2  
## 40 1.5 0.2  
## 41 1.3 0.3  
## 42 1.3 0.3  
## 43 1.3 0.2  
## 44 1.6 0.6  
## 45 1.9 0.4  
## 46 1.4 0.3  
## 47 1.6 0.2  
## 48 1.4 0.2  
## 49 1.5 0.2  
## 50 1.4 0.2  
## 51 4.7 1.4  
## 52 4.5 1.5  
## 53 4.9 1.5  
## 54 4.0 1.3  
## 55 4.6 1.5  
## 56 4.5 1.3  
## 57 4.7 1.6  
## 58 3.3 1.0  
## 59 4.6 1.3  
## 60 3.9 1.4  
## 61 3.5 1.0  
## 62 4.2 1.5  
## 63 4.0 1.0  
## 64 4.7 1.4  
## 65 3.6 1.3  
## 66 4.4 1.4  
## 67 4.5 1.5  
## 68 4.1 1.0  
## 69 4.5 1.5  
## 70 3.9 1.1  
## 71 4.8 1.8  
## 72 4.0 1.3  
## 73 4.9 1.5  
## 74 4.7 1.2  
## 75 4.3 1.3  
## 76 4.4 1.4  
## 77 4.8 1.4  
## 78 5.0 1.7  
## 79 4.5 1.5  
## 80 3.5 1.0  
## 81 3.8 1.1  
## 82 3.7 1.0  
## 83 3.9 1.2  
## 84 5.1 1.6  
## 85 4.5 1.5  
## 86 4.5 1.6  
## 87 4.7 1.5  
## 88 4.4 1.3  
## 89 4.1 1.3  
## 90 4.0 1.3  
## 91 4.4 1.2  
## 92 4.6 1.4  
## 93 4.0 1.2  
## 94 3.3 1.0  
## 95 4.2 1.3  
## 96 4.2 1.2  
## 97 4.2 1.3  
## 98 4.3 1.3  
## 99 3.0 1.1  
## 100 4.1 1.3  
## 101 6.0 2.5  
## 102 5.1 1.9  
## 103 5.9 2.1  
## 104 5.6 1.8  
## 105 5.8 2.2  
## 106 6.6 2.1  
## 107 4.5 1.7  
## 108 6.3 1.8  
## 109 5.8 1.8  
## 110 6.1 2.5  
## 111 5.1 2.0  
## 112 5.3 1.9  
## 113 5.5 2.1  
## 114 5.0 2.0  
## 115 5.1 2.4  
## 116 5.3 2.3  
## 117 5.5 1.8  
## 118 6.7 2.2  
## 119 6.9 2.3  
## 120 5.0 1.5  
## 121 5.7 2.3  
## 122 4.9 2.0  
## 123 6.7 2.0  
## 124 4.9 1.8  
## 125 5.7 2.1  
## 126 6.0 1.8  
## 127 4.8 1.8  
## 128 4.9 1.8  
## 129 5.6 2.1  
## 130 5.8 1.6  
## 131 6.1 1.9  
## 132 6.4 2.0  
## 133 5.6 2.2  
## 134 5.1 1.5  
## 135 5.6 1.4  
## 136 6.1 2.3  
## 137 5.6 2.4  
## 138 5.5 1.8  
## 139 4.8 1.8  
## 140 5.4 2.1  
## 141 5.6 2.4  
## 142 5.1 2.3  
## 143 5.1 1.9  
## 144 5.9 2.3  
## 145 5.7 2.5  
## 146 5.2 2.3  
## 147 5.0 1.9  
## 148 5.2 2.0  
## 149 5.4 2.3  
## 150 5.1 1.8

select(iris, starts\_with("Sepal"))

## Sepal.Length Sepal.Width  
## 1 5.1 3.5  
## 2 4.9 3.0  
## 3 4.7 3.2  
## 4 4.6 3.1  
## 5 5.0 3.6  
## 6 5.4 3.9  
## 7 4.6 3.4  
## 8 5.0 3.4  
## 9 4.4 2.9  
## 10 4.9 3.1  
## 11 5.4 3.7  
## 12 4.8 3.4  
## 13 4.8 3.0  
## 14 4.3 3.0  
## 15 5.8 4.0  
## 16 5.7 4.4  
## 17 5.4 3.9  
## 18 5.1 3.5  
## 19 5.7 3.8  
## 20 5.1 3.8  
## 21 5.4 3.4  
## 22 5.1 3.7  
## 23 4.6 3.6  
## 24 5.1 3.3  
## 25 4.8 3.4  
## 26 5.0 3.0  
## 27 5.0 3.4  
## 28 5.2 3.5  
## 29 5.2 3.4  
## 30 4.7 3.2  
## 31 4.8 3.1  
## 32 5.4 3.4  
## 33 5.2 4.1  
## 34 5.5 4.2  
## 35 4.9 3.1  
## 36 5.0 3.2  
## 37 5.5 3.5  
## 38 4.9 3.6  
## 39 4.4 3.0  
## 40 5.1 3.4  
## 41 5.0 3.5  
## 42 4.5 2.3  
## 43 4.4 3.2  
## 44 5.0 3.5  
## 45 5.1 3.8  
## 46 4.8 3.0  
## 47 5.1 3.8  
## 48 4.6 3.2  
## 49 5.3 3.7  
## 50 5.0 3.3  
## 51 7.0 3.2  
## 52 6.4 3.2  
## 53 6.9 3.1  
## 54 5.5 2.3  
## 55 6.5 2.8  
## 56 5.7 2.8  
## 57 6.3 3.3  
## 58 4.9 2.4  
## 59 6.6 2.9  
## 60 5.2 2.7  
## 61 5.0 2.0  
## 62 5.9 3.0  
## 63 6.0 2.2  
## 64 6.1 2.9  
## 65 5.6 2.9  
## 66 6.7 3.1  
## 67 5.6 3.0  
## 68 5.8 2.7  
## 69 6.2 2.2  
## 70 5.6 2.5  
## 71 5.9 3.2  
## 72 6.1 2.8  
## 73 6.3 2.5  
## 74 6.1 2.8  
## 75 6.4 2.9  
## 76 6.6 3.0  
## 77 6.8 2.8  
## 78 6.7 3.0  
## 79 6.0 2.9  
## 80 5.7 2.6  
## 81 5.5 2.4  
## 82 5.5 2.4  
## 83 5.8 2.7  
## 84 6.0 2.7  
## 85 5.4 3.0  
## 86 6.0 3.4  
## 87 6.7 3.1  
## 88 6.3 2.3  
## 89 5.6 3.0  
## 90 5.5 2.5  
## 91 5.5 2.6  
## 92 6.1 3.0  
## 93 5.8 2.6  
## 94 5.0 2.3  
## 95 5.6 2.7  
## 96 5.7 3.0  
## 97 5.7 2.9  
## 98 6.2 2.9  
## 99 5.1 2.5  
## 100 5.7 2.8  
## 101 6.3 3.3  
## 102 5.8 2.7  
## 103 7.1 3.0  
## 104 6.3 2.9  
## 105 6.5 3.0  
## 106 7.6 3.0  
## 107 4.9 2.5  
## 108 7.3 2.9  
## 109 6.7 2.5  
## 110 7.2 3.6  
## 111 6.5 3.2  
## 112 6.4 2.7  
## 113 6.8 3.0  
## 114 5.7 2.5  
## 115 5.8 2.8  
## 116 6.4 3.2  
## 117 6.5 3.0  
## 118 7.7 3.8  
## 119 7.7 2.6  
## 120 6.0 2.2  
## 121 6.9 3.2  
## 122 5.6 2.8  
## 123 7.7 2.8  
## 124 6.3 2.7  
## 125 6.7 3.3  
## 126 7.2 3.2  
## 127 6.2 2.8  
## 128 6.1 3.0  
## 129 6.4 2.8  
## 130 7.2 3.0  
## 131 7.4 2.8  
## 132 7.9 3.8  
## 133 6.4 2.8  
## 134 6.3 2.8  
## 135 6.1 2.6  
## 136 7.7 3.0  
## 137 6.3 3.4  
## 138 6.4 3.1  
## 139 6.0 3.0  
## 140 6.9 3.1  
## 141 6.7 3.1  
## 142 6.9 3.1  
## 143 5.8 2.7  
## 144 6.8 3.2  
## 145 6.7 3.3  
## 146 6.7 3.0  
## 147 6.3 2.5  
## 148 6.5 3.0  
## 149 6.2 3.4  
## 150 5.9 3.0

select(iris, Species, everything())

## Species Sepal.Length Sepal.Width Petal.Length Petal.Width  
## 1 setosa 5.1 3.5 1.4 0.2  
## 2 setosa 4.9 3.0 1.4 0.2  
## 3 setosa 4.7 3.2 1.3 0.2  
## 4 setosa 4.6 3.1 1.5 0.2  
## 5 setosa 5.0 3.6 1.4 0.2  
## 6 setosa 5.4 3.9 1.7 0.4  
## 7 setosa 4.6 3.4 1.4 0.3  
## 8 setosa 5.0 3.4 1.5 0.2  
## 9 setosa 4.4 2.9 1.4 0.2  
## 10 setosa 4.9 3.1 1.5 0.1  
## 11 setosa 5.4 3.7 1.5 0.2  
## 12 setosa 4.8 3.4 1.6 0.2  
## 13 setosa 4.8 3.0 1.4 0.1  
## 14 setosa 4.3 3.0 1.1 0.1  
## 15 setosa 5.8 4.0 1.2 0.2  
## 16 setosa 5.7 4.4 1.5 0.4  
## 17 setosa 5.4 3.9 1.3 0.4  
## 18 setosa 5.1 3.5 1.4 0.3  
## 19 setosa 5.7 3.8 1.7 0.3  
## 20 setosa 5.1 3.8 1.5 0.3  
## 21 setosa 5.4 3.4 1.7 0.2  
## 22 setosa 5.1 3.7 1.5 0.4  
## 23 setosa 4.6 3.6 1.0 0.2  
## 24 setosa 5.1 3.3 1.7 0.5  
## 25 setosa 4.8 3.4 1.9 0.2  
## 26 setosa 5.0 3.0 1.6 0.2  
## 27 setosa 5.0 3.4 1.6 0.4  
## 28 setosa 5.2 3.5 1.5 0.2  
## 29 setosa 5.2 3.4 1.4 0.2  
## 30 setosa 4.7 3.2 1.6 0.2  
## 31 setosa 4.8 3.1 1.6 0.2  
## 32 setosa 5.4 3.4 1.5 0.4  
## 33 setosa 5.2 4.1 1.5 0.1  
## 34 setosa 5.5 4.2 1.4 0.2  
## 35 setosa 4.9 3.1 1.5 0.2  
## 36 setosa 5.0 3.2 1.2 0.2  
## 37 setosa 5.5 3.5 1.3 0.2  
## 38 setosa 4.9 3.6 1.4 0.1  
## 39 setosa 4.4 3.0 1.3 0.2  
## 40 setosa 5.1 3.4 1.5 0.2  
## 41 setosa 5.0 3.5 1.3 0.3  
## 42 setosa 4.5 2.3 1.3 0.3  
## 43 setosa 4.4 3.2 1.3 0.2  
## 44 setosa 5.0 3.5 1.6 0.6  
## 45 setosa 5.1 3.8 1.9 0.4  
## 46 setosa 4.8 3.0 1.4 0.3  
## 47 setosa 5.1 3.8 1.6 0.2  
## 48 setosa 4.6 3.2 1.4 0.2  
## 49 setosa 5.3 3.7 1.5 0.2  
## 50 setosa 5.0 3.3 1.4 0.2  
## 51 versicolor 7.0 3.2 4.7 1.4  
## 52 versicolor 6.4 3.2 4.5 1.5  
## 53 versicolor 6.9 3.1 4.9 1.5  
## 54 versicolor 5.5 2.3 4.0 1.3  
## 55 versicolor 6.5 2.8 4.6 1.5  
## 56 versicolor 5.7 2.8 4.5 1.3  
## 57 versicolor 6.3 3.3 4.7 1.6  
## 58 versicolor 4.9 2.4 3.3 1.0  
## 59 versicolor 6.6 2.9 4.6 1.3  
## 60 versicolor 5.2 2.7 3.9 1.4  
## 61 versicolor 5.0 2.0 3.5 1.0  
## 62 versicolor 5.9 3.0 4.2 1.5  
## 63 versicolor 6.0 2.2 4.0 1.0  
## 64 versicolor 6.1 2.9 4.7 1.4  
## 65 versicolor 5.6 2.9 3.6 1.3  
## 66 versicolor 6.7 3.1 4.4 1.4  
## 67 versicolor 5.6 3.0 4.5 1.5  
## 68 versicolor 5.8 2.7 4.1 1.0  
## 69 versicolor 6.2 2.2 4.5 1.5  
## 70 versicolor 5.6 2.5 3.9 1.1  
## 71 versicolor 5.9 3.2 4.8 1.8  
## 72 versicolor 6.1 2.8 4.0 1.3  
## 73 versicolor 6.3 2.5 4.9 1.5  
## 74 versicolor 6.1 2.8 4.7 1.2  
## 75 versicolor 6.4 2.9 4.3 1.3  
## 76 versicolor 6.6 3.0 4.4 1.4  
## 77 versicolor 6.8 2.8 4.8 1.4  
## 78 versicolor 6.7 3.0 5.0 1.7  
## 79 versicolor 6.0 2.9 4.5 1.5  
## 80 versicolor 5.7 2.6 3.5 1.0  
## 81 versicolor 5.5 2.4 3.8 1.1  
## 82 versicolor 5.5 2.4 3.7 1.0  
## 83 versicolor 5.8 2.7 3.9 1.2  
## 84 versicolor 6.0 2.7 5.1 1.6  
## 85 versicolor 5.4 3.0 4.5 1.5  
## 86 versicolor 6.0 3.4 4.5 1.6  
## 87 versicolor 6.7 3.1 4.7 1.5  
## 88 versicolor 6.3 2.3 4.4 1.3  
## 89 versicolor 5.6 3.0 4.1 1.3  
## 90 versicolor 5.5 2.5 4.0 1.3  
## 91 versicolor 5.5 2.6 4.4 1.2  
## 92 versicolor 6.1 3.0 4.6 1.4  
## 93 versicolor 5.8 2.6 4.0 1.2  
## 94 versicolor 5.0 2.3 3.3 1.0  
## 95 versicolor 5.6 2.7 4.2 1.3  
## 96 versicolor 5.7 3.0 4.2 1.2  
## 97 versicolor 5.7 2.9 4.2 1.3  
## 98 versicolor 6.2 2.9 4.3 1.3  
## 99 versicolor 5.1 2.5 3.0 1.1  
## 100 versicolor 5.7 2.8 4.1 1.3  
## 101 virginica 6.3 3.3 6.0 2.5  
## 102 virginica 5.8 2.7 5.1 1.9  
## 103 virginica 7.1 3.0 5.9 2.1  
## 104 virginica 6.3 2.9 5.6 1.8  
## 105 virginica 6.5 3.0 5.8 2.2  
## 106 virginica 7.6 3.0 6.6 2.1  
## 107 virginica 4.9 2.5 4.5 1.7  
## 108 virginica 7.3 2.9 6.3 1.8  
## 109 virginica 6.7 2.5 5.8 1.8  
## 110 virginica 7.2 3.6 6.1 2.5  
## 111 virginica 6.5 3.2 5.1 2.0  
## 112 virginica 6.4 2.7 5.3 1.9  
## 113 virginica 6.8 3.0 5.5 2.1  
## 114 virginica 5.7 2.5 5.0 2.0  
## 115 virginica 5.8 2.8 5.1 2.4  
## 116 virginica 6.4 3.2 5.3 2.3  
## 117 virginica 6.5 3.0 5.5 1.8  
## 118 virginica 7.7 3.8 6.7 2.2  
## 119 virginica 7.7 2.6 6.9 2.3  
## 120 virginica 6.0 2.2 5.0 1.5  
## 121 virginica 6.9 3.2 5.7 2.3  
## 122 virginica 5.6 2.8 4.9 2.0  
## 123 virginica 7.7 2.8 6.7 2.0  
## 124 virginica 6.3 2.7 4.9 1.8  
## 125 virginica 6.7 3.3 5.7 2.1  
## 126 virginica 7.2 3.2 6.0 1.8  
## 127 virginica 6.2 2.8 4.8 1.8  
## 128 virginica 6.1 3.0 4.9 1.8  
## 129 virginica 6.4 2.8 5.6 2.1  
## 130 virginica 7.2 3.0 5.8 1.6  
## 131 virginica 7.4 2.8 6.1 1.9  
## 132 virginica 7.9 3.8 6.4 2.0  
## 133 virginica 6.4 2.8 5.6 2.2  
## 134 virginica 6.3 2.8 5.1 1.5  
## 135 virginica 6.1 2.6 5.6 1.4  
## 136 virginica 7.7 3.0 6.1 2.3  
## 137 virginica 6.3 3.4 5.6 2.4  
## 138 virginica 6.4 3.1 5.5 1.8  
## 139 virginica 6.0 3.0 4.8 1.8  
## 140 virginica 6.9 3.1 5.4 2.1  
## 141 virginica 6.7 3.1 5.6 2.4  
## 142 virginica 6.9 3.1 5.1 2.3  
## 143 virginica 5.8 2.7 5.1 1.9  
## 144 virginica 6.8 3.2 5.9 2.3  
## 145 virginica 6.7 3.3 5.7 2.5  
## 146 virginica 6.7 3.0 5.2 2.3  
## 147 virginica 6.3 2.5 5.0 1.9  
## 148 virginica 6.5 3.0 5.2 2.0  
## 149 virginica 6.2 3.4 5.4 2.3  
## 150 virginica 5.9 3.0 5.1 1.8

select(iris, -Sepal.Length)

## Sepal.Width Petal.Length Petal.Width Species  
## 1 3.5 1.4 0.2 setosa  
## 2 3.0 1.4 0.2 setosa  
## 3 3.2 1.3 0.2 setosa  
## 4 3.1 1.5 0.2 setosa  
## 5 3.6 1.4 0.2 setosa  
## 6 3.9 1.7 0.4 setosa  
## 7 3.4 1.4 0.3 setosa  
## 8 3.4 1.5 0.2 setosa  
## 9 2.9 1.4 0.2 setosa  
## 10 3.1 1.5 0.1 setosa  
## 11 3.7 1.5 0.2 setosa  
## 12 3.4 1.6 0.2 setosa  
## 13 3.0 1.4 0.1 setosa  
## 14 3.0 1.1 0.1 setosa  
## 15 4.0 1.2 0.2 setosa  
## 16 4.4 1.5 0.4 setosa  
## 17 3.9 1.3 0.4 setosa  
## 18 3.5 1.4 0.3 setosa  
## 19 3.8 1.7 0.3 setosa  
## 20 3.8 1.5 0.3 setosa  
## 21 3.4 1.7 0.2 setosa  
## 22 3.7 1.5 0.4 setosa  
## 23 3.6 1.0 0.2 setosa  
## 24 3.3 1.7 0.5 setosa  
## 25 3.4 1.9 0.2 setosa  
## 26 3.0 1.6 0.2 setosa  
## 27 3.4 1.6 0.4 setosa  
## 28 3.5 1.5 0.2 setosa  
## 29 3.4 1.4 0.2 setosa  
## 30 3.2 1.6 0.2 setosa  
## 31 3.1 1.6 0.2 setosa  
## 32 3.4 1.5 0.4 setosa  
## 33 4.1 1.5 0.1 setosa  
## 34 4.2 1.4 0.2 setosa  
## 35 3.1 1.5 0.2 setosa  
## 36 3.2 1.2 0.2 setosa  
## 37 3.5 1.3 0.2 setosa  
## 38 3.6 1.4 0.1 setosa  
## 39 3.0 1.3 0.2 setosa  
## 40 3.4 1.5 0.2 setosa  
## 41 3.5 1.3 0.3 setosa  
## 42 2.3 1.3 0.3 setosa  
## 43 3.2 1.3 0.2 setosa  
## 44 3.5 1.6 0.6 setosa  
## 45 3.8 1.9 0.4 setosa  
## 46 3.0 1.4 0.3 setosa  
## 47 3.8 1.6 0.2 setosa  
## 48 3.2 1.4 0.2 setosa  
## 49 3.7 1.5 0.2 setosa  
## 50 3.3 1.4 0.2 setosa  
## 51 3.2 4.7 1.4 versicolor  
## 52 3.2 4.5 1.5 versicolor  
## 53 3.1 4.9 1.5 versicolor  
## 54 2.3 4.0 1.3 versicolor  
## 55 2.8 4.6 1.5 versicolor  
## 56 2.8 4.5 1.3 versicolor  
## 57 3.3 4.7 1.6 versicolor  
## 58 2.4 3.3 1.0 versicolor  
## 59 2.9 4.6 1.3 versicolor  
## 60 2.7 3.9 1.4 versicolor  
## 61 2.0 3.5 1.0 versicolor  
## 62 3.0 4.2 1.5 versicolor  
## 63 2.2 4.0 1.0 versicolor  
## 64 2.9 4.7 1.4 versicolor  
## 65 2.9 3.6 1.3 versicolor  
## 66 3.1 4.4 1.4 versicolor  
## 67 3.0 4.5 1.5 versicolor  
## 68 2.7 4.1 1.0 versicolor  
## 69 2.2 4.5 1.5 versicolor  
## 70 2.5 3.9 1.1 versicolor  
## 71 3.2 4.8 1.8 versicolor  
## 72 2.8 4.0 1.3 versicolor  
## 73 2.5 4.9 1.5 versicolor  
## 74 2.8 4.7 1.2 versicolor  
## 75 2.9 4.3 1.3 versicolor  
## 76 3.0 4.4 1.4 versicolor  
## 77 2.8 4.8 1.4 versicolor  
## 78 3.0 5.0 1.7 versicolor  
## 79 2.9 4.5 1.5 versicolor  
## 80 2.6 3.5 1.0 versicolor  
## 81 2.4 3.8 1.1 versicolor  
## 82 2.4 3.7 1.0 versicolor  
## 83 2.7 3.9 1.2 versicolor  
## 84 2.7 5.1 1.6 versicolor  
## 85 3.0 4.5 1.5 versicolor  
## 86 3.4 4.5 1.6 versicolor  
## 87 3.1 4.7 1.5 versicolor  
## 88 2.3 4.4 1.3 versicolor  
## 89 3.0 4.1 1.3 versicolor  
## 90 2.5 4.0 1.3 versicolor  
## 91 2.6 4.4 1.2 versicolor  
## 92 3.0 4.6 1.4 versicolor  
## 93 2.6 4.0 1.2 versicolor  
## 94 2.3 3.3 1.0 versicolor  
## 95 2.7 4.2 1.3 versicolor  
## 96 3.0 4.2 1.2 versicolor  
## 97 2.9 4.2 1.3 versicolor  
## 98 2.9 4.3 1.3 versicolor  
## 99 2.5 3.0 1.1 versicolor  
## 100 2.8 4.1 1.3 versicolor  
## 101 3.3 6.0 2.5 virginica  
## 102 2.7 5.1 1.9 virginica  
## 103 3.0 5.9 2.1 virginica  
## 104 2.9 5.6 1.8 virginica  
## 105 3.0 5.8 2.2 virginica  
## 106 3.0 6.6 2.1 virginica  
## 107 2.5 4.5 1.7 virginica  
## 108 2.9 6.3 1.8 virginica  
## 109 2.5 5.8 1.8 virginica  
## 110 3.6 6.1 2.5 virginica  
## 111 3.2 5.1 2.0 virginica  
## 112 2.7 5.3 1.9 virginica  
## 113 3.0 5.5 2.1 virginica  
## 114 2.5 5.0 2.0 virginica  
## 115 2.8 5.1 2.4 virginica  
## 116 3.2 5.3 2.3 virginica  
## 117 3.0 5.5 1.8 virginica  
## 118 3.8 6.7 2.2 virginica  
## 119 2.6 6.9 2.3 virginica  
## 120 2.2 5.0 1.5 virginica  
## 121 3.2 5.7 2.3 virginica  
## 122 2.8 4.9 2.0 virginica  
## 123 2.8 6.7 2.0 virginica  
## 124 2.7 4.9 1.8 virginica  
## 125 3.3 5.7 2.1 virginica  
## 126 3.2 6.0 1.8 virginica  
## 127 2.8 4.8 1.8 virginica  
## 128 3.0 4.9 1.8 virginica  
## 129 2.8 5.6 2.1 virginica  
## 130 3.0 5.8 1.6 virginica  
## 131 2.8 6.1 1.9 virginica  
## 132 3.8 6.4 2.0 virginica  
## 133 2.8 5.6 2.2 virginica  
## 134 2.8 5.1 1.5 virginica  
## 135 2.6 5.6 1.4 virginica  
## 136 3.0 6.1 2.3 virginica  
## 137 3.4 5.6 2.4 virginica  
## 138 3.1 5.5 1.8 virginica  
## 139 3.0 4.8 1.8 virginica  
## 140 3.1 5.4 2.1 virginica  
## 141 3.1 5.6 2.4 virginica  
## 142 3.1 5.1 2.3 virginica  
## 143 2.7 5.1 1.9 virginica  
## 144 3.2 5.9 2.3 virginica  
## 145 3.3 5.7 2.5 virginica  
## 146 3.0 5.2 2.3 virginica  
## 147 2.5 5.0 1.9 virginica  
## 148 3.0 5.2 2.0 virginica  
## 149 3.4 5.4 2.3 virginica  
## 150 3.0 5.1 1.8 virginica

# Filter

starwars

## # A tibble: 87 x 13  
## name height mass hair\_color skin\_color eye\_color birth\_year gender  
## <chr> <int> <dbl> <chr> <chr> <chr> <dbl> <chr>   
## 1 Luke… 172 77 blond fair blue 19 male   
## 2 C-3PO 167 75 <NA> gold yellow 112 <NA>   
## 3 R2-D2 96 32 <NA> white, bl… red 33 <NA>   
## 4 Dart… 202 136 none white yellow 41.9 male   
## 5 Leia… 150 49 brown light brown 19 female  
## 6 Owen… 178 120 brown, gr… light blue 52 male   
## 7 Beru… 165 75 brown light blue 47 female  
## 8 R5-D4 97 32 <NA> white, red red NA <NA>   
## 9 Bigg… 183 84 black light brown 24 male   
## 10 Obi-… 182 77 auburn, w… fair blue-gray 57 male   
## # … with 77 more rows, and 5 more variables: homeworld <chr>,  
## # species <chr>, films <list>, vehicles <list>, starships <list>

class(starwars)

## [1] "tbl\_df" "tbl" "data.frame"

# It works on a dataframe  
  
filter(starwars, species == 'Human')

## # A tibble: 35 x 13  
## name height mass hair\_color skin\_color eye\_color birth\_year gender  
## <chr> <int> <dbl> <chr> <chr> <chr> <dbl> <chr>   
## 1 Luke… 172 77 blond fair blue 19 male   
## 2 Dart… 202 136 none white yellow 41.9 male   
## 3 Leia… 150 49 brown light brown 19 female  
## 4 Owen… 178 120 brown, gr… light blue 52 male   
## 5 Beru… 165 75 brown light blue 47 female  
## 6 Bigg… 183 84 black light brown 24 male   
## 7 Obi-… 182 77 auburn, w… fair blue-gray 57 male   
## 8 Anak… 188 84 blond fair blue 41.9 male   
## 9 Wilh… 180 NA auburn, g… fair blue 64 male   
## 10 Han … 180 80 brown fair brown 29 male   
## # … with 25 more rows, and 5 more variables: homeworld <chr>,  
## # species <chr>, films <list>, vehicles <list>, starships <list>

filter(starwars, mass > 100)

## # A tibble: 10 x 13  
## name height mass hair\_color skin\_color eye\_color birth\_year gender  
## <chr> <int> <dbl> <chr> <chr> <chr> <dbl> <chr>   
## 1 Dart… 202 136 none white yellow 41.9 male   
## 2 Owen… 178 120 brown, gr… light blue 52 male   
## 3 Chew… 228 112 brown unknown blue 200 male   
## 4 Jabb… 175 1358 <NA> green-tan… orange 600 herma…  
## 5 Jek … 180 110 brown fair blue NA male   
## 6 IG-88 200 140 none metal red 15 none   
## 7 Bossk 190 113 none green red 53 male   
## 8 Dext… 198 102 none brown yellow NA male   
## 9 Grie… 216 159 none brown, wh… green, y… NA male   
## 10 Tarf… 234 136 brown brown blue NA male   
## # … with 5 more variables: homeworld <chr>, species <chr>, films <list>,  
## # vehicles <list>, starships <list>

filter(starwars, species == 'Human', mass > 100)

## # A tibble: 3 x 13  
## name height mass hair\_color skin\_color eye\_color birth\_year gender  
## <chr> <int> <dbl> <chr> <chr> <chr> <dbl> <chr>   
## 1 Dart… 202 136 none white yellow 41.9 male   
## 2 Owen… 178 120 brown, gr… light blue 52 male   
## 3 Jek … 180 110 brown fair blue NA male   
## # … with 5 more variables: homeworld <chr>, species <chr>, films <list>,  
## # vehicles <list>, starships <list>

filter(starwars, species == 'Human' & mass > 100)

## # A tibble: 3 x 13  
## name height mass hair\_color skin\_color eye\_color birth\_year gender  
## <chr> <int> <dbl> <chr> <chr> <chr> <dbl> <chr>   
## 1 Dart… 202 136 none white yellow 41.9 male   
## 2 Owen… 178 120 brown, gr… light blue 52 male   
## 3 Jek … 180 110 brown fair blue NA male   
## # … with 5 more variables: homeworld <chr>, species <chr>, films <list>,  
## # vehicles <list>, starships <list>

filter(starwars, species == 'Human' | mass > 100)

## # A tibble: 42 x 13  
## name height mass hair\_color skin\_color eye\_color birth\_year gender  
## <chr> <int> <dbl> <chr> <chr> <chr> <dbl> <chr>   
## 1 Luke… 172 77 blond fair blue 19 male   
## 2 Dart… 202 136 none white yellow 41.9 male   
## 3 Leia… 150 49 brown light brown 19 female  
## 4 Owen… 178 120 brown, gr… light blue 52 male   
## 5 Beru… 165 75 brown light blue 47 female  
## 6 Bigg… 183 84 black light brown 24 male   
## 7 Obi-… 182 77 auburn, w… fair blue-gray 57 male   
## 8 Anak… 188 84 blond fair blue 41.9 male   
## 9 Wilh… 180 NA auburn, g… fair blue 64 male   
## 10 Chew… 228 112 brown unknown blue 200 male   
## # … with 32 more rows, and 5 more variables: homeworld <chr>,  
## # species <chr>, films <list>, vehicles <list>, starships <list>

filter(starwars, gender == 'female')

## # A tibble: 19 x 13  
## name height mass hair\_color skin\_color eye\_color birth\_year gender  
## <chr> <int> <dbl> <chr> <chr> <chr> <dbl> <chr>   
## 1 Leia… 150 49 brown light brown 19 female  
## 2 Beru… 165 75 brown light blue 47 female  
## 3 Mon … 150 NA auburn fair blue 48 female  
## 4 Shmi… 163 NA black fair brown 72 female  
## 5 Ayla… 178 55 none blue hazel 48 female  
## 6 Adi … 184 50 none dark blue NA female  
## 7 Cordé 157 NA brown light brown NA female  
## 8 Lumi… 170 56.2 black yellow blue 58 female  
## 9 Barr… 166 50 black yellow blue 40 female  
## 10 Dormé 165 NA brown light brown NA female  
## 11 Zam … 168 55 blonde fair, gre… yellow NA female  
## 12 Taun… 213 NA none grey black NA female  
## 13 Joca… 167 NA white fair blue NA female  
## 14 R4-P… 96 NA none silver, r… red, blue NA female  
## 15 Shaa… 178 57 none red, blue… black NA female  
## 16 Sly … 178 48 none pale white NA female  
## 17 Rey NA NA brown light hazel NA female  
## 18 Capt… NA NA unknown unknown unknown NA female  
## 19 Padm… 165 45 brown light brown 46 female  
## # … with 5 more variables: homeworld <chr>, species <chr>, films <list>,  
## # vehicles <list>, starships <list>

# It works just as well on a tibble  
  
tib\_starwars = as.tibble(starwars)

## Warning: `as.tibble()` is deprecated, use `as\_tibble()` (but mind the new semantics).  
## This warning is displayed once per session.

class(tib\_starwars)

## [1] "tbl\_df" "tbl" "data.frame"

filter(tib\_starwars, species == 'Human')

## # A tibble: 35 x 13  
## name height mass hair\_color skin\_color eye\_color birth\_year gender  
## <chr> <int> <dbl> <chr> <chr> <chr> <dbl> <chr>   
## 1 Luke… 172 77 blond fair blue 19 male   
## 2 Dart… 202 136 none white yellow 41.9 male   
## 3 Leia… 150 49 brown light brown 19 female  
## 4 Owen… 178 120 brown, gr… light blue 52 male   
## 5 Beru… 165 75 brown light blue 47 female  
## 6 Bigg… 183 84 black light brown 24 male   
## 7 Obi-… 182 77 auburn, w… fair blue-gray 57 male   
## 8 Anak… 188 84 blond fair blue 41.9 male   
## 9 Wilh… 180 NA auburn, g… fair blue 64 male   
## 10 Han … 180 80 brown fair brown 29 male   
## # … with 25 more rows, and 5 more variables: homeworld <chr>,  
## # species <chr>, films <list>, vehicles <list>, starships <list>