Examine, Subset, and Filter Data

# Examine, Subset and Filter Data

Here, we’ll be using everyone’s favorite dataset, iris! It’s built into R, so no need to download or read in anything. (Don’t forget to run the set up chunks at the top of the document before getting started)

These topics aren’t the flashiest or most interesting, but they’re the most important. This is what you spend the majority of time doing.

## Examine/Look at Your Data

The first thing you need to with data is look at it. If you don’t know how it’s structured, how can you do anything with it?

The simplest way is just to type the data table name and it will print.

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

Be careful about doing this though! You can see that it printed out the entire table and some tables have thousands of rows! Use with caution. A much safer option is to use head() to print out the first 6 (by default) rows of the table.

head(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

You can also specify how many rows of the table you want head() to print out.

head(iris, 10)

## 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

You can use the opposite function of head(), tail() to look at the last 6 (by default) rows of the table

tail(iris)

## Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 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

Another helpful thing to know is the number of rows and columns in your table, which you can get with dim(). Dim always prints the number of rows first, then the number of columns.

dim(iris)

## [1] 150 5

You might also want to know the overall structure of your table, which you can see with str()

str(iris)

## 'data.frame': 150 obs. of 5 variables:  
## $ Sepal.Length: num 5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...  
## $ Sepal.Width : num 3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...  
## $ Petal.Length: num 1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...  
## $ Petal.Width : num 0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...  
## $ Species : Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...

First, starting from the top row, str() shows you the class, aka the type of table R has your data stored in. For example, a matrix can only hold numbers, but a dataframe like iris is can hold mixed types of information in this case numbers and written categorical descriptions. (We’ll talk about this more at a later time.) It tells you what the dimensions of the table are; there are 150 obs, rows, of 5 variables, columns. All of the rows starting with a $ represent columns. Each tells you the column name, the type of data in the column, numbers, characters, etc, and shows the first ten entries in the column.

## Quick Detour to Logicals

These operators are how you compare values to each other. Keep them in mind for subsetting and filtering going forward.

* equals ==
* not equal to !=
* greater than >
* greater than or equal to >=
* less than <
* less than or equal to <=
* and &
* or |

## Subsetting

Frequently, you will only want to work with part of a table or look at only part of a table. To reduce the size of the table, you have to subset it. The two most useful operators (symbols) you can use to subset in R are square brackets [], and dollar signs ‘$’.

### Basics

When you subset a table with square brackets, you have to put square brackets next to the name of the table.

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

However, if you don’t put anything inside the brackets, it returns the entire table, just like typing the name of the table. You have to supply numbers specifing the row number and column number, like in the chunk below.

# return row 3, column 5  
iris[3,5]

## [1] setosa  
## Levels: setosa versicolor virginica

This returns the value in row 3, column 5. But a single number isn’t that helpful. You can get an entire row or column by supplying a number and leaving the other side of the comma blank, like below.

# return row 1 in all columns (no number after the comma selects all columns)  
iris[1,]

## Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 1 5.1 3.5 1.4 0.2 setosa

# return all rows in column 1 (no number before the comma selects all rows)  
iris[,1]

## [1] 5.1 4.9 4.7 4.6 5.0 5.4 4.6 5.0 4.4 4.9 5.4 4.8 4.8 4.3 5.8 5.7 5.4  
## [18] 5.1 5.7 5.1 5.4 5.1 4.6 5.1 4.8 5.0 5.0 5.2 5.2 4.7 4.8 5.4 5.2 5.5  
## [35] 4.9 5.0 5.5 4.9 4.4 5.1 5.0 4.5 4.4 5.0 5.1 4.8 5.1 4.6 5.3 5.0 7.0  
## [52] 6.4 6.9 5.5 6.5 5.7 6.3 4.9 6.6 5.2 5.0 5.9 6.0 6.1 5.6 6.7 5.6 5.8  
## [69] 6.2 5.6 5.9 6.1 6.3 6.1 6.4 6.6 6.8 6.7 6.0 5.7 5.5 5.5 5.8 6.0 5.4  
## [86] 6.0 6.7 6.3 5.6 5.5 5.5 6.1 5.8 5.0 5.6 5.7 5.7 6.2 5.1 5.7 6.3 5.8  
## [103] 7.1 6.3 6.5 7.6 4.9 7.3 6.7 7.2 6.5 6.4 6.8 5.7 5.8 6.4 6.5 7.7 7.7  
## [120] 6.0 6.9 5.6 7.7 6.3 6.7 7.2 6.2 6.1 6.4 7.2 7.4 7.9 6.4 6.3 6.1 7.7  
## [137] 6.3 6.4 6.0 6.9 6.7 6.9 5.8 6.8 6.7 6.7 6.3 6.5 6.2 5.9

You can also get an entire column using the $ operator like below

iris$Petal.Width

## [1] 0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 0.2 0.2 0.1 0.1 0.2 0.4 0.4  
## [18] 0.3 0.3 0.3 0.2 0.4 0.2 0.5 0.2 0.2 0.4 0.2 0.2 0.2 0.2 0.4 0.1 0.2  
## [35] 0.2 0.2 0.2 0.1 0.2 0.2 0.3 0.3 0.2 0.6 0.4 0.3 0.2 0.2 0.2 0.2 1.4  
## [52] 1.5 1.5 1.3 1.5 1.3 1.6 1.0 1.3 1.4 1.0 1.5 1.0 1.4 1.3 1.4 1.5 1.0  
## [69] 1.5 1.1 1.8 1.3 1.5 1.2 1.3 1.4 1.4 1.7 1.5 1.0 1.1 1.0 1.2 1.6 1.5  
## [86] 1.6 1.5 1.3 1.3 1.3 1.2 1.4 1.2 1.0 1.3 1.2 1.3 1.3 1.1 1.3 2.5 1.9  
## [103] 2.1 1.8 2.2 2.1 1.7 1.8 1.8 2.5 2.0 1.9 2.1 2.0 2.4 2.3 1.8 2.2 2.3  
## [120] 1.5 2.3 2.0 2.0 1.8 2.1 1.8 1.8 1.8 2.1 1.6 1.9 2.0 2.2 1.5 1.4 2.3  
## [137] 2.4 1.8 1.8 2.1 2.4 2.3 1.9 2.3 2.5 2.3 1.9 2.0 2.3 1.8

### Other stuff you can put in square brackets

The majority of the time, you’ll want more than a single row and/or column, so here are more complicated ways of subsetting.

You can use negative numbers to drop rows and/or columns.

# drop the first column  
iris[,-1]

## 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

You can separate numbers with a colon to select everything between them

# select rows 1 to 5 and columns 2 to 4  
iris[1:5,2:4]

## Sepal.Width Petal.Length Petal.Width  
## 1 3.5 1.4 0.2  
## 2 3.0 1.4 0.2  
## 3 3.2 1.3 0.2  
## 4 3.1 1.5 0.2  
## 5 3.6 1.4 0.2

You can supply vectors (list values) to specify exactly which rows and columns you want

iris[c(37, 49, 132, 12, 77), c(1, 3)]

## Sepal.Length Petal.Length  
## 37 5.5 1.3  
## 49 5.3 1.5  
## 132 7.9 6.4  
## 12 4.8 1.6  
## 77 6.8 4.8

You can use logicals to select data only of a certain type.

# get all columns and all rows where sepal length is greater than or equal to 5  
iris[iris$Sepal.Length >= 5,]

## Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 1 5.1 3.5 1.4 0.2 setosa  
## 5 5.0 3.6 1.4 0.2 setosa  
## 6 5.4 3.9 1.7 0.4 setosa  
## 8 5.0 3.4 1.5 0.2 setosa  
## 11 5.4 3.7 1.5 0.2 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  
## 24 5.1 3.3 1.7 0.5 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  
## 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  
## 36 5.0 3.2 1.2 0.2 setosa  
## 37 5.5 3.5 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  
## 44 5.0 3.5 1.6 0.6 setosa  
## 45 5.1 3.8 1.9 0.4 setosa  
## 47 5.1 3.8 1.6 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  
## 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  
## 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

# get all columns and all rows species is NOT viriginica  
iris[iris$Species != 'virginica',]

## 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

## Filtering And Selecting

Everything we’ve been doing so far today is included in R by default. filter() and select() are in the dplyr package, part of the tidyverse. Before you can use them you have to load either dplyr or the whole tidyverse.

# load just the dplyr package  
library(dplyr)  
  
### OR  
  
# load the tidyverse  
library(tidyverse)

### filter()

filter() selects rows based on the criteria you give it. You specify what column you want to filter on and by what values.

filter(iris, Petal.Length <= 2)

## 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

You can filter on as many columns as you want.

filter(iris, Petal.Length >= 2, Sepal.Length <= 5)

## Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 1 4.9 2.4 3.3 1.0 versicolor  
## 2 5.0 2.0 3.5 1.0 versicolor  
## 3 5.0 2.3 3.3 1.0 versicolor  
## 4 4.9 2.5 4.5 1.7 virginica

### select()

select() selects columns

select(iris, Species)

## Species  
## 1 setosa  
## 2 setosa  
## 3 setosa  
## 4 setosa  
## 5 setosa  
## 6 setosa  
## 7 setosa  
## 8 setosa  
## 9 setosa  
## 10 setosa  
## 11 setosa  
## 12 setosa  
## 13 setosa  
## 14 setosa  
## 15 setosa  
## 16 setosa  
## 17 setosa  
## 18 setosa  
## 19 setosa  
## 20 setosa  
## 21 setosa  
## 22 setosa  
## 23 setosa  
## 24 setosa  
## 25 setosa  
## 26 setosa  
## 27 setosa  
## 28 setosa  
## 29 setosa  
## 30 setosa  
## 31 setosa  
## 32 setosa  
## 33 setosa  
## 34 setosa  
## 35 setosa  
## 36 setosa  
## 37 setosa  
## 38 setosa  
## 39 setosa  
## 40 setosa  
## 41 setosa  
## 42 setosa  
## 43 setosa  
## 44 setosa  
## 45 setosa  
## 46 setosa  
## 47 setosa  
## 48 setosa  
## 49 setosa  
## 50 setosa  
## 51 versicolor  
## 52 versicolor  
## 53 versicolor  
## 54 versicolor  
## 55 versicolor  
## 56 versicolor  
## 57 versicolor  
## 58 versicolor  
## 59 versicolor  
## 60 versicolor  
## 61 versicolor  
## 62 versicolor  
## 63 versicolor  
## 64 versicolor  
## 65 versicolor  
## 66 versicolor  
## 67 versicolor  
## 68 versicolor  
## 69 versicolor  
## 70 versicolor  
## 71 versicolor  
## 72 versicolor  
## 73 versicolor  
## 74 versicolor  
## 75 versicolor  
## 76 versicolor  
## 77 versicolor  
## 78 versicolor  
## 79 versicolor  
## 80 versicolor  
## 81 versicolor  
## 82 versicolor  
## 83 versicolor  
## 84 versicolor  
## 85 versicolor  
## 86 versicolor  
## 87 versicolor  
## 88 versicolor  
## 89 versicolor  
## 90 versicolor  
## 91 versicolor  
## 92 versicolor  
## 93 versicolor  
## 94 versicolor  
## 95 versicolor  
## 96 versicolor  
## 97 versicolor  
## 98 versicolor  
## 99 versicolor  
## 100 versicolor  
## 101 virginica  
## 102 virginica  
## 103 virginica  
## 104 virginica  
## 105 virginica  
## 106 virginica  
## 107 virginica  
## 108 virginica  
## 109 virginica  
## 110 virginica  
## 111 virginica  
## 112 virginica  
## 113 virginica  
## 114 virginica  
## 115 virginica  
## 116 virginica  
## 117 virginica  
## 118 virginica  
## 119 virginica  
## 120 virginica  
## 121 virginica  
## 122 virginica  
## 123 virginica  
## 124 virginica  
## 125 virginica  
## 126 virginica  
## 127 virginica  
## 128 virginica  
## 129 virginica  
## 130 virginica  
## 131 virginica  
## 132 virginica  
## 133 virginica  
## 134 virginica  
## 135 virginica  
## 136 virginica  
## 137 virginica  
## 138 virginica  
## 139 virginica  
## 140 virginica  
## 141 virginica  
## 142 virginica  
## 143 virginica  
## 144 virginica  
## 145 virginica  
## 146 virginica  
## 147 virginica  
## 148 virginica  
## 149 virginica  
## 150 virginica

You can select multiple columns

select(iris, Sepal.Width, Petal.Width, Species)

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

You can also drop columns by putting a minus sign, -, in front of them

select(iris, -Species)

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