Sesion 3

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Dataframes

```
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
```

```
?iris
```

```
## starting httpd help server ... done
```

```
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
```

```
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
```

```
dim(iris)
```

```
## [1] 150   5
```

```
summary(iris)
```

```
##   Sepal.Length    Sepal.Width     Petal.Length    Petal.Width
## Min.   :4.300   Min.   :2.000   Min.   :1.000   Min.   :0.100
## 1st Qu.:5.100   1st Qu.:2.800   1st Qu.:1.600   1st Qu.:0.300
## Median :5.800   Median :3.000   Median :4.350   Median :1.300
## Mean   :5.843   Mean   :3.057   Mean   :3.758   Mean   :1.199
## 3rd Qu.:6.400   3rd Qu.:3.300   3rd Qu.:5.100   3rd Qu.:1.800
## Max.   :7.900   Max.   :4.400   Max.   :6.900   Max.   :2.500
##        Species
## setosa    :50
## versicolor:50
## virginica :50
##
##
##
```

```r
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 ...
```

```r
q <- iris + 2
```

Manipulando un dataframe

```
## Warning in Ops.factor(left, right): '+' not meaningful for factors
```

```r
q
```

```
##    Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1           7.1         5.5          3.4         2.2      NA
## 2           6.9         5.0          3.4         2.2      NA
## 3           6.7         5.2          3.3         2.2      NA
## 4           6.6         5.1          3.5         2.2      NA
## 5           7.0         5.6          3.4         2.2      NA
## 6           7.4         5.9          3.7         2.4      NA
## 7           6.6         5.4          3.4         2.3      NA
## 8           7.0         5.4          3.5         2.2      NA
## 9           6.4         4.9          3.4         2.2      NA
## 10          6.9         5.1          3.5         2.1      NA
## 11          7.4         5.7          3.5         2.2      NA
## 12          6.8         5.4          3.6         2.2      NA
## 13          6.8         5.0          3.4         2.1      NA
## 14          6.3         5.0          3.1         2.1      NA
## 15          7.8         6.0          3.2         2.2      NA
## 16          7.7         6.4          3.5         2.4      NA
## 17          7.4         5.9          3.3         2.4      NA
## 18          7.1         5.5          3.4         2.3      NA
## 19          7.7         5.8          3.7         2.3      NA
## 20          7.1         5.8          3.5         2.3      NA
## 21          7.4         5.4          3.7         2.2      NA
## 22          7.1         5.7          3.5         2.4      NA
## 23          6.6         5.6          3.0         2.2      NA
## 24          7.1         5.3          3.7         2.5      NA
## 25          6.8         5.4          3.9         2.2      NA
## 26          7.0         5.0          3.6         2.2      NA
## 27          7.0         5.4          3.6         2.4      NA
## 28          7.2         5.5          3.5         2.2      NA
## 29          7.2         5.4          3.4         2.2      NA
## 30          6.7         5.2          3.6         2.2      NA
## 31          6.8         5.1          3.6         2.2      NA
```

```
## 32          7.4          5.4          3.5          2.4          NA
## 33          7.2          6.1          3.5          2.1          NA
## 34          7.5          6.2          3.4          2.2          NA
## 35          6.9          5.1          3.5          2.2          NA
## 36          7.0          5.2          3.2          2.2          NA
## 37          7.5          5.5          3.3          2.2          NA
## 38          6.9          5.6          3.4          2.1          NA
## 39          6.4          5.0          3.3          2.2          NA
## 40          7.1          5.4          3.5          2.2          NA
## 41          7.0          5.5          3.3          2.3          NA
## 42          6.5          4.3          3.3          2.3          NA
## 43          6.4          5.2          3.3          2.2          NA
## 44          7.0          5.5          3.6          2.6          NA
## 45          7.1          5.8          3.9          2.4          NA
## 46          6.8          5.0          3.4          2.3          NA
## 47          7.1          5.8          3.6          2.2          NA
## 48          6.6          5.2          3.4          2.2          NA
## 49          7.3          5.7          3.5          2.2          NA
## 50          7.0          5.3          3.4          2.2          NA
## 51          9.0          5.2          6.7          3.4          NA
## 52          8.4          5.2          6.5          3.5          NA
## 53          8.9          5.1          6.9          3.5          NA
## 54          7.5          4.3          6.0          3.3          NA
## 55          8.5          4.8          6.6          3.5          NA
## 56          7.7          4.8          6.5          3.3          NA
## 57          8.3          5.3          6.7          3.6          NA
## 58          6.9          4.4          5.3          3.0          NA
## 59          8.6          4.9          6.6          3.3          NA
## 60          7.2          4.7          5.9          3.4          NA
## 61          7.0          4.0          5.5          3.0          NA
## 62          7.9          5.0          6.2          3.5          NA
## 63          8.0          4.2          6.0          3.0          NA
## 64          8.1          4.9          6.7          3.4          NA
## 65          7.6          4.9          5.6          3.3          NA
## 66          8.7          5.1          6.4          3.4          NA
## 67          7.6          5.0          6.5          3.5          NA
## 68          7.8          4.7          6.1          3.0          NA
## 69          8.2          4.2          6.5          3.5          NA
## 70          7.6          4.5          5.9          3.1          NA
## 71          7.9          5.2          6.8          3.8          NA
## 72          8.1          4.8          6.0          3.3          NA
## 73          8.3          4.5          6.9          3.5          NA
## 74          8.1          4.8          6.7          3.2          NA
## 75          8.4          4.9          6.3          3.3          NA
## 76          8.6          5.0          6.4          3.4          NA
## 77          8.8          4.8          6.8          3.4          NA
## 78          8.7          5.0          7.0          3.7          NA
## 79          8.0          4.9          6.5          3.5          NA
## 80          7.7          4.6          5.5          3.0          NA
## 81          7.5          4.4          5.8          3.1          NA
## 82          7.5          4.4          5.7          3.0          NA
## 83          7.8          4.7          5.9          3.2          NA
## 84          8.0          4.7          7.1          3.6          NA
## 85          7.4          5.0          6.5          3.5          NA
```

```
## 86      8.0      5.4      6.5      3.6      NA
## 87      8.7      5.1      6.7      3.5      NA
## 88      8.3      4.3      6.4      3.3      NA
## 89      7.6      5.0      6.1      3.3      NA
## 90      7.5      4.5      6.0      3.3      NA
## 91      7.5      4.6      6.4      3.2      NA
## 92      8.1      5.0      6.6      3.4      NA
## 93      7.8      4.6      6.0      3.2      NA
## 94      7.0      4.3      5.3      3.0      NA
## 95      7.6      4.7      6.2      3.3      NA
## 96      7.7      5.0      6.2      3.2      NA
## 97      7.7      4.9      6.2      3.3      NA
## 98      8.2      4.9      6.3      3.3      NA
## 99      7.1      4.5      5.0      3.1      NA
## 100     7.7      4.8      6.1      3.3      NA
## 101     8.3      5.3      8.0      4.5      NA
## 102     7.8      4.7      7.1      3.9      NA
## 103     9.1      5.0      7.9      4.1      NA
## 104     8.3      4.9      7.6      3.8      NA
## 105     8.5      5.0      7.8      4.2      NA
## 106     9.6      5.0      8.6      4.1      NA
## 107     6.9      4.5      6.5      3.7      NA
## 108     9.3      4.9      8.3      3.8      NA
## 109     8.7      4.5      7.8      3.8      NA
## 110     9.2      5.6      8.1      4.5      NA
## 111     8.5      5.2      7.1      4.0      NA
## 112     8.4      4.7      7.3      3.9      NA
## 113     8.8      5.0      7.5      4.1      NA
## 114     7.7      4.5      7.0      4.0      NA
## 115     7.8      4.8      7.1      4.4      NA
## 116     8.4      5.2      7.3      4.3      NA
## 117     8.5      5.0      7.5      3.8      NA
## 118     9.7      5.8      8.7      4.2      NA
## 119     9.7      4.6      8.9      4.3      NA
## 120     8.0      4.2      7.0      3.5      NA
## 121     8.9      5.2      7.7      4.3      NA
## 122     7.6      4.8      6.9      4.0      NA
## 123     9.7      4.8      8.7      4.0      NA
## 124     8.3      4.7      6.9      3.8      NA
## 125     8.7      5.3      7.7      4.1      NA
## 126     9.2      5.2      8.0      3.8      NA
## 127     8.2      4.8      6.8      3.8      NA
## 128     8.1      5.0      6.9      3.8      NA
## 129     8.4      4.8      7.6      4.1      NA
## 130     9.2      5.0      7.8      3.6      NA
## 131     9.4      4.8      8.1      3.9      NA
## 132     9.9      5.8      8.4      4.0      NA
## 133     8.4      4.8      7.6      4.2      NA
## 134     8.3      4.8      7.1      3.5      NA
## 135     8.1      4.6      7.6      3.4      NA
## 136     9.7      5.0      8.1      4.3      NA
## 137     8.3      5.4      7.6      4.4      NA
## 138     8.4      5.1      7.5      3.8      NA
## 139     8.0      5.0      6.8      3.8      NA
```

```
## 140          8.9          5.1          7.4          4.1          NA
## 141          8.7          5.1          7.6          4.4          NA
## 142          8.9          5.1          7.1          4.3          NA
## 143          7.8          4.7          7.1          3.9          NA
## 144          8.8          5.2          7.9          4.3          NA
## 145          8.7          5.3          7.7          4.5          NA
## 146          8.7          5.0          7.2          4.3          NA
## 147          8.3          4.5          7.0          3.9          NA
## 148          8.5          5.0          7.2          4.0          NA
## 149          8.2          5.4          7.4          4.3          NA
## 150          7.9          5.0          7.1          3.8          NA
```

Subconjuntos de una estructura de datos

Indices

Vectores

```r
color <- c("rojo", "amarillo", "azul")
```

```r
length(color)
```

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

para usar indices usaremos []

```r
color[2]
```

```
## [1] "amarillo"
```

```r
color[c(1,2)]
```

```
## [1] "rojo"     "amarillo"
```

```r
color[-1]
```

```
## [1] "amarillo" "azul"
```

```r
color[c(-1,-3)]
```

```
## [1] "amarillo"
```

```r
colores_primarios_solo_amarillo <- color[c(-1,-3)]
```

Dataframes

```r
dim(iris)
```

```
## [1] 150   5
```

```r
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
```

```r
iris[2,2]
```

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

```r
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 5.1
##  [19] 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 4.9 5.0
##  [37] 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 6.4 6.9 5.5
##  [55] 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 6.2 5.6 5.9 6.1
##  [73] 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 6.0 6.7 6.3 5.6 5.5
##  [91] 5.5 6.1 5.8 5.0 5.6 5.7 5.7 6.2 5.1 5.7 6.3 5.8 7.1 6.3 6.5 7.6 4.9 7.3
## [109] 6.7 7.2 6.5 6.4 6.8 5.7 5.8 6.4 6.5 7.7 7.7 6.0 6.9 5.6 7.7 6.3 6.7 7.2
## [127] 6.2 6.1 6.4 7.2 7.4 7.9 6.4 6.3 6.1 7.7 6.3 6.4 6.0 6.9 6.7 6.9 5.8 6.8
## [145] 6.7 6.7 6.3 6.5 6.2 5.9
```

```r
iris[1,]
```

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

```r
iris[,c(1,3,5)]
```

```
##    Sepal.Length Petal.Length    Species
## 1           5.1          1.4     setosa
## 2           4.9          1.4     setosa
## 3           4.7          1.3     setosa
## 4           4.6          1.5     setosa
## 5           5.0          1.4     setosa
## 6           5.4          1.7     setosa
## 7           4.6          1.4     setosa
## 8           5.0          1.5     setosa
## 9           4.4          1.4     setosa
## 10          4.9          1.5     setosa
## 11          5.4          1.5     setosa
## 12          4.8          1.6     setosa
```

```
## 13      4.8        1.4       setosa
## 14      4.3        1.1       setosa
## 15      5.8        1.2       setosa
## 16      5.7        1.5       setosa
## 17      5.4        1.3       setosa
## 18      5.1        1.4       setosa
## 19      5.7        1.7       setosa
## 20      5.1        1.5       setosa
## 21      5.4        1.7       setosa
## 22      5.1        1.5       setosa
## 23      4.6        1.0       setosa
## 24      5.1        1.7       setosa
## 25      4.8        1.9       setosa
## 26      5.0        1.6       setosa
## 27      5.0        1.6       setosa
## 28      5.2        1.5       setosa
## 29      5.2        1.4       setosa
## 30      4.7        1.6       setosa
## 31      4.8        1.6       setosa
## 32      5.4        1.5       setosa
## 33      5.2        1.5       setosa
## 34      5.5        1.4       setosa
## 35      4.9        1.5       setosa
## 36      5.0        1.2       setosa
## 37      5.5        1.3       setosa
## 38      4.9        1.4       setosa
## 39      4.4        1.3       setosa
## 40      5.1        1.5       setosa
## 41      5.0        1.3       setosa
## 42      4.5        1.3       setosa
## 43      4.4        1.3       setosa
## 44      5.0        1.6       setosa
## 45      5.1        1.9       setosa
## 46      4.8        1.4       setosa
## 47      5.1        1.6       setosa
## 48      4.6        1.4       setosa
## 49      5.3        1.5       setosa
## 50      5.0        1.4       setosa
## 51      7.0        4.7 versicolor
## 52      6.4        4.5 versicolor
## 53      6.9        4.9 versicolor
## 54      5.5        4.0 versicolor
## 55      6.5        4.6 versicolor
## 56      5.7        4.5 versicolor
## 57      6.3        4.7 versicolor
## 58      4.9        3.3 versicolor
## 59      6.6        4.6 versicolor
## 60      5.2        3.9 versicolor
## 61      5.0        3.5 versicolor
## 62      5.9        4.2 versicolor
## 63      6.0        4.0 versicolor
## 64      6.1        4.7 versicolor
## 65      5.6        3.6 versicolor
## 66      6.7        4.4 versicolor
```

```
## 67           5.6          4.5 versicolor
## 68           5.8          4.1 versicolor
## 69           6.2          4.5 versicolor
## 70           5.6          3.9 versicolor
## 71           5.9          4.8 versicolor
## 72           6.1          4.0 versicolor
## 73           6.3          4.9 versicolor
## 74           6.1          4.7 versicolor
## 75           6.4          4.3 versicolor
## 76           6.6          4.4 versicolor
## 77           6.8          4.8 versicolor
## 78           6.7          5.0 versicolor
## 79           6.0          4.5 versicolor
## 80           5.7          3.5 versicolor
## 81           5.5          3.8 versicolor
## 82           5.5          3.7 versicolor
## 83           5.8          3.9 versicolor
## 84           6.0          5.1 versicolor
## 85           5.4          4.5 versicolor
## 86           6.0          4.5 versicolor
## 87           6.7          4.7 versicolor
## 88           6.3          4.4 versicolor
## 89           5.6          4.1 versicolor
## 90           5.5          4.0 versicolor
## 91           5.5          4.4 versicolor
## 92           6.1          4.6 versicolor
## 93           5.8          4.0 versicolor
## 94           5.0          3.3 versicolor
## 95           5.6          4.2 versicolor
## 96           5.7          4.2 versicolor
## 97           5.7          4.2 versicolor
## 98           6.2          4.3 versicolor
## 99           5.1          3.0 versicolor
## 100          5.7          4.1 versicolor
## 101          6.3          6.0  virginica
## 102          5.8          5.1  virginica
## 103          7.1          5.9  virginica
## 104          6.3          5.6  virginica
## 105          6.5          5.8  virginica
## 106          7.6          6.6  virginica
## 107          4.9          4.5  virginica
## 108          7.3          6.3  virginica
## 109          6.7          5.8  virginica
## 110          7.2          6.1  virginica
## 111          6.5          5.1  virginica
## 112          6.4          5.3  virginica
## 113          6.8          5.5  virginica
## 114          5.7          5.0  virginica
## 115          5.8          5.1  virginica
## 116          6.4          5.3  virginica
## 117          6.5          5.5  virginica
## 118          7.7          6.7  virginica
## 119          7.7          6.9  virginica
## 120          6.0          5.0  virginica
```

```
## 121          6.9          5.7  virginica
## 122          5.6          4.9  virginica
## 123          7.7          6.7  virginica
## 124          6.3          4.9  virginica
## 125          6.7          5.7  virginica
## 126          7.2          6.0  virginica
## 127          6.2          4.8  virginica
## 128          6.1          4.9  virginica
## 129          6.4          5.6  virginica
## 130          7.2          5.8  virginica
## 131          7.4          6.1  virginica
## 132          7.9          6.4  virginica
## 133          6.4          5.6  virginica
## 134          6.3          5.1  virginica
## 135          6.1          5.6  virginica
## 136          7.7          6.1  virginica
## 137          6.3          5.6  virginica
## 138          6.4          5.5  virginica
## 139          6.0          4.8  virginica
## 140          6.9          5.4  virginica
## 141          6.7          5.6  virginica
## 142          6.9          5.1  virginica
## 143          5.8          5.1  virginica
## 144          6.8          5.9  virginica
## 145          6.7          5.7  virginica
## 146          6.7          5.2  virginica
## 147          6.3          5.0  virginica
## 148          6.5          5.2  virginica
## 149          6.2          5.4  virginica
## 150          5.9          5.1  virginica
```

```r
iris[c(1,3,5),]
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1          5.1         3.5          1.4         0.2  setosa
## 3          4.7         3.2          1.3         0.2  setosa
## 5          5.0         3.6          1.4         0.2  setosa
```

```r
iris[c(1,3,5),c(1,2)]
```

```
##   Sepal.Length Sepal.Width
## 1          5.1         3.5
## 3          4.7         3.2
## 5          5.0         3.6
```

```r
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
```

nombre de las variables

```
names(iris)
```

```
## [1] "Sepal.Length" "Sepal.Width"  "Petal.Length" "Petal.Width"  "Species"
```

```
iris["Sepal.Length"]
```

```
##     Sepal.Length
## 1            5.1
## 2            4.9
## 3            4.7
## 4            4.6
## 5            5.0
```

```
## 6            5.4
## 7            4.6
## 8            5.0
## 9            4.4
## 10           4.9
## 11           5.4
## 12           4.8
## 13           4.8
## 14           4.3
## 15           5.8
## 16           5.7
## 17           5.4
## 18           5.1
## 19           5.7
## 20           5.1
## 21           5.4
## 22           5.1
## 23           4.6
## 24           5.1
## 25           4.8
## 26           5.0
## 27           5.0
## 28           5.2
## 29           5.2
## 30           4.7
## 31           4.8
## 32           5.4
## 33           5.2
## 34           5.5
## 35           4.9
## 36           5.0
## 37           5.5
## 38           4.9
## 39           4.4
## 40           5.1
## 41           5.0
## 42           4.5
## 43           4.4
## 44           5.0
## 45           5.1
## 46           4.8
## 47           5.1
## 48           4.6
## 49           5.3
## 50           5.0
## 51           7.0
## 52           6.4
## 53           6.9
## 54           5.5
## 55           6.5
## 56           5.7
## 57           6.3
## 58           4.9
## 59           6.6
```

```
## 60       5.2
## 61       5.0
## 62       5.9
## 63       6.0
## 64       6.1
## 65       5.6
## 66       6.7
## 67       5.6
## 68       5.8
## 69       6.2
## 70       5.6
## 71       5.9
## 72       6.1
## 73       6.3
## 74       6.1
## 75       6.4
## 76       6.6
## 77       6.8
## 78       6.7
## 79       6.0
## 80       5.7
## 81       5.5
## 82       5.5
## 83       5.8
## 84       6.0
## 85       5.4
## 86       6.0
## 87       6.7
## 88       6.3
## 89       5.6
## 90       5.5
## 91       5.5
## 92       6.1
## 93       5.8
## 94       5.0
## 95       5.6
## 96       5.7
## 97       5.7
## 98       6.2
## 99       5.1
## 100      5.7
## 101      6.3
## 102      5.8
## 103      7.1
## 104      6.3
## 105      6.5
## 106      7.6
## 107      4.9
## 108      7.3
## 109      6.7
## 110      7.2
## 111      6.5
## 112      6.4
## 113      6.8
```

```
## 114        5.7
## 115        5.8
## 116        6.4
## 117        6.5
## 118        7.7
## 119        7.7
## 120        6.0
## 121        6.9
## 122        5.6
## 123        7.7
## 124        6.3
## 125        6.7
## 126        7.2
## 127        6.2
## 128        6.1
## 129        6.4
## 130        7.2
## 131        7.4
## 132        7.9
## 133        6.4
## 134        6.3
## 135        6.1
## 136        7.7
## 137        6.3
## 138        6.4
## 139        6.0
## 140        6.9
## 141        6.7
## 142        6.9
## 143        5.8
## 144        6.8
## 145        6.7
## 146        6.7
## 147        6.3
## 148        6.5
## 149        6.2
## 150        5.9
```

Condicionales

Data_frame[condicion, columnas_devueltas]

```
summary(iris)
```

```
##   Sepal.Length    Sepal.Width     Petal.Length    Petal.Width
##   Min.   :4.300   Min.   :2.000   Min.   :1.000   Min.   :0.100
##   1st Qu.:5.100   1st Qu.:2.800   1st Qu.:1.600   1st Qu.:0.300
##   Median :5.800   Median :3.000   Median :4.350   Median :1.300
##   Mean   :5.843   Mean   :3.057   Mean   :3.758   Mean   :1.199
##   3rd Qu.:6.400   3rd Qu.:3.300   3rd Qu.:5.100   3rd Qu.:1.800
##   Max.   :7.900   Max.   :4.400   Max.   :6.900   Max.   :2.500
##        Species
##   setosa    :50
```

```
## versicolor:50
## virginica :50
##
##
##
```

```
o1 <- iris[iris$Sepal.Length >= 5.8, ]
o1
```

```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 15           5.8         4.0          1.2         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
## 55           6.5         2.8          4.6         1.5 versicolor
## 57           6.3         3.3          4.7         1.6 versicolor
## 59           6.6         2.9          4.6         1.3 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
## 66           6.7         3.1          4.4         1.4 versicolor
## 68           5.8         2.7          4.1         1.0 versicolor
## 69           6.2         2.2          4.5         1.5 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
## 83           5.8         2.7          3.9         1.2 versicolor
## 84           6.0         2.7          5.1         1.6 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
## 92           6.1         3.0          4.6         1.4 versicolor
## 93           5.8         2.6          4.0         1.2 versicolor
## 98           6.2         2.9          4.3         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
## 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
## 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
```

```
summary(o1)
```

```
##   Sepal.Length    Sepal.Width     Petal.Length    Petal.Width
##   Min.   :5.800   Min.   :2.200   Min.   :1.200   Min.   :0.200
##   1st Qu.:6.100   1st Qu.:2.800   1st Qu.:4.700   1st Qu.:1.500
##   Median :6.400   Median :3.000   Median :5.100   Median :1.800
##   Mean   :6.509   Mean   :2.962   Mean   :5.132   Mean   :1.774
##   3rd Qu.:6.800   3rd Qu.:3.100   3rd Qu.:5.600   3rd Qu.:2.100
##   Max.   :7.900   Max.   :4.000   Max.   :6.900   Max.   :2.500
##        Species
##   setosa    : 1
##   versicolor:29
##   virginica :47
##
##
##
```

```
iris[iris$Sepal.Length >= 5.8 & iris$Species == "setosa", ]
```

```
##    Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 15          5.8           4          1.2         0.2  setosa
```

```
summary(o1)
```

```
##   Sepal.Length    Sepal.Width    Petal.Length    Petal.Width
## Min.   :5.800   Min.   :2.200   Min.   :1.200   Min.   :0.200
## 1st Qu.:6.100   1st Qu.:2.800   1st Qu.:4.700   1st Qu.:1.500
## Median :6.400   Median :3.000   Median :5.100   Median :1.800
## Mean   :6.509   Mean   :2.962   Mean   :5.132   Mean   :1.774
## 3rd Qu.:6.800   3rd Qu.:3.100   3rd Qu.:5.600   3rd Qu.:2.100
## Max.   :7.900   Max.   :4.000   Max.   :6.900   Max.   :2.500
##        Species
## setosa    : 1
## versicolor:29
## virginica :47
##
##
##
```

```
iris[iris$Sepal.Length >= 5.8 & iris$Petal.Length  < .5, ]
```

```
## [1] Sepal.Length Sepal.Width  Petal.Length Petal.Width  Species
## <0 rows> (or 0-length row.names)
```

```
iris[iris$Sepal.Length >= 5.8 & iris$Petal.Length  < 5, ]
```

```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 15           5.8         4.0          1.2         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
## 55           6.5         2.8          4.6         1.5 versicolor
## 57           6.3         3.3          4.7         1.6 versicolor
## 59           6.6         2.9          4.6         1.3 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
## 66           6.7         3.1          4.4         1.4 versicolor
## 68           5.8         2.7          4.1         1.0 versicolor
## 69           6.2         2.2          4.5         1.5 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
## 79           6.0         2.9          4.5         1.5 versicolor
## 83           5.8         2.7          3.9         1.2 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
## 92             6.1          3.0          4.6          1.4 versicolor
## 93             5.8          2.6          4.0          1.2 versicolor
## 98             6.2          2.9          4.3          1.3 versicolor
## 124            6.3          2.7          4.9          1.8  virginica
## 127            6.2          2.8          4.8          1.8  virginica
## 128            6.1          3.0          4.9          1.8  virginica
## 139            6.0          3.0          4.8          1.8  virginica
```

```r
iris[iris$Sepal.Length >= 7.9, ]
```

```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
## 132          7.9         3.8          6.4           2 virginica
```

```r
iris[iris$Sepal.Length >= 7.9 | iris$Species == "versicolor", ]
```

```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 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
## 132           7.9            3.8            6.4            2.0  virginica
```

Dplyr, tydeverse

Funciones

```
nombre <- function(argumentos){
operaciones a realizar
}
```

Area de un cuadrado

$$lado * lado$$

```
area_cuadrado <- function(lado){
  lado * lado
}
```
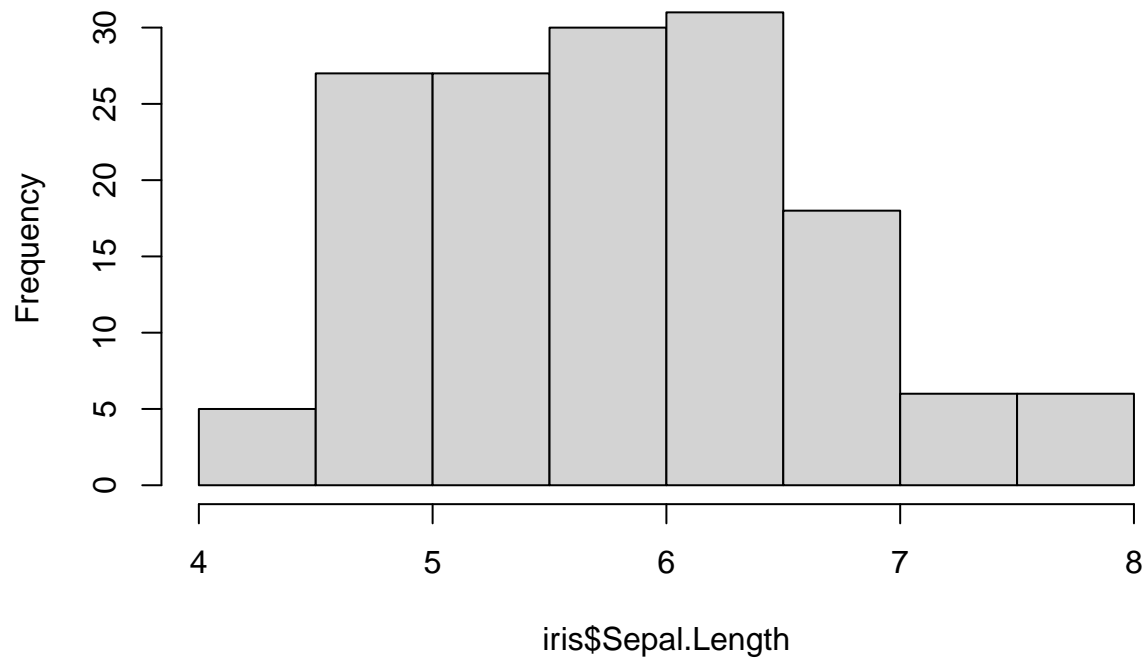
```
area_cuadrado(lado = 3)
```

```
## [1] 9
```

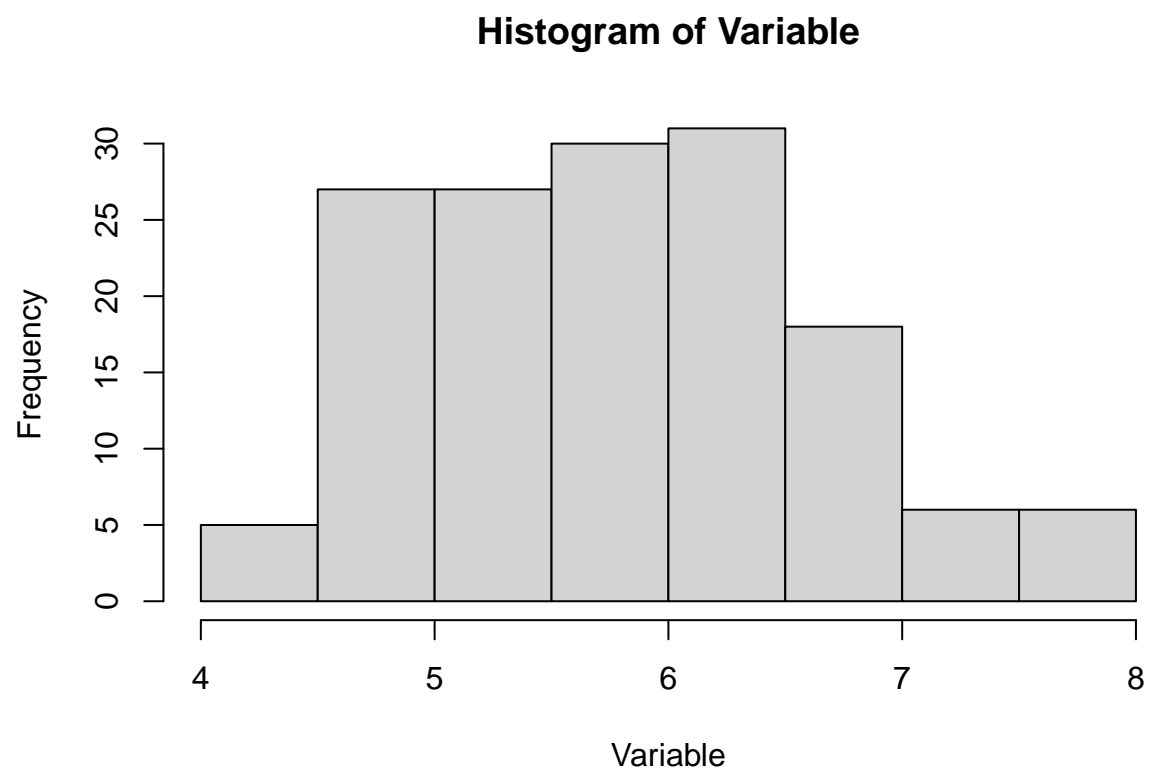## Crear un histograma

hist()

```
hist(iris$Sepal.Length)
```

Histogram of iris$Sepal.Length

iris$Sepal.Length

```r
t1est <- function(Variable){
  hist(Variable)
  mean(Variable)
  min(Variable)
}
```

```r
t1est(iris$Sepal.Length)
```

Histogram of Variable


```
## [1] 4.3
```