

```
# instalar o pacote mlbench
install.packages("mlbench", repos = "http://cran.us.r-project.org")
```

## 1. Carregue a base de dados Satellite

```
##
## The downloaded binary packages are in
## /var/folders/7c/43lddvnj7bsfph_4fmdrns140000gp/T//RtmpsCSR5/downloaded_packages
```

```
# usar o pacote mlbench
library(mlbench)
```

```
# carregar os dados Satellite
data(Satellite)
```

```
# apresentar alguma medidas estatísticas do dados Satellite
summary(Satellite)
```

```
##          x.1          x.2          x.3          x.4
## Min.   : 39.0   Min.   : 27.00   Min.   : 53.00   Min.   : 33.00
## 1st Qu.: 60.0   1st Qu.: 71.00   1st Qu.: 85.00   1st Qu.: 69.00
## Median : 68.0   Median : 87.00   Median :101.00   Median : 81.00
## Mean   : 69.4   Mean   : 83.59   Mean   : 99.29   Mean   : 82.59
## 3rd Qu.: 80.0   3rd Qu.:103.00   3rd Qu.:113.00   3rd Qu.: 92.00
## Max.   :104.0   Max.   :137.00   Max.   :140.00   Max.   :154.00
##          x.5          x.6          x.7          x.8
## Min.   : 39.00   Min.   : 27.00   Min.   : 50.00   Min.   : 29.0
## 1st Qu.: 60.00   1st Qu.: 71.00   1st Qu.: 85.00   1st Qu.: 69.0
## Median : 68.00   Median : 85.00   Median :101.00   Median : 81.0
## Mean   : 69.15   Mean   : 83.24   Mean   : 99.11   Mean   : 82.5
## 3rd Qu.: 80.00   3rd Qu.:103.00   3rd Qu.:113.00   3rd Qu.: 92.0
## Max.   :104.00   Max.   :137.00   Max.   :145.00   Max.   :157.0
##          x.9          x.10          x.11          x.12
## Min.   : 40.00   Min.   : 27.00   Min.   : 50.00   Min.   : 29.00
## 1st Qu.: 60.00   1st Qu.: 71.00   1st Qu.: 85.00   1st Qu.: 68.00
## Median : 67.00   Median : 85.00   Median :100.00   Median : 81.00
## Mean   : 68.91   Mean   : 82.89   Mean   : 98.85   Mean   : 82.39
## 3rd Qu.: 79.00   3rd Qu.:102.00   3rd Qu.:113.00   3rd Qu.: 92.00
## Max.   :104.00   Max.   :130.00   Max.   :145.00   Max.   :157.00
##          x.13          x.14          x.15          x.16
## Min.   : 39.00   Min.   : 27.00   Min.   : 50.00   Min.   : 29.00
## 1st Qu.: 60.00   1st Qu.: 71.00   1st Qu.: 85.00   1st Qu.: 69.00
## Median : 68.00   Median : 85.00   Median :101.00   Median : 81.00
## Mean   : 69.29   Mean   : 83.48   Mean   : 99.31   Mean   : 82.64
## 3rd Qu.: 80.00   3rd Qu.:103.00   3rd Qu.:113.00   3rd Qu.: 92.00
## Max.   :104.00   Max.   :137.00   Max.   :145.00   Max.   :154.00
##          x.17          x.18          x.19          x.20
## Min.   : 40.00   Min.   : 27.00   Min.   : 50.00   Min.   : 29.0
## 1st Qu.: 60.00   1st Qu.: 71.00   1st Qu.: 85.00   1st Qu.: 69.0
## Median : 68.00   Median : 85.00   Median :100.00   Median : 81.0
## Mean   : 69.05   Mean   : 83.17   Mean   : 99.15   Mean   : 82.6
## 3rd Qu.: 79.00   3rd Qu.:103.00   3rd Qu.:113.00   3rd Qu.: 92.0
## Max.   :104.00   Max.   :130.00   Max.   :145.00   Max.   :157.0
##          x.21          x.22          x.23          x.24
## Min.   : 39.00   Min.   : 27.00   Min.   : 50.00   Min.   : 29.00
```

```
## 1st Qu.: 60.00 1st Qu.: 71.00 1st Qu.: 85.00 1st Qu.: 68.00
## Median : 67.00 Median : 84.00 Median :100.00 Median : 81.00
## Mean : 68.84 Mean : 82.86 Mean : 98.95 Mean : 82.47
## 3rd Qu.: 79.00 3rd Qu.:103.00 3rd Qu.:113.00 3rd Qu.: 92.00
## Max. :104.00 Max. :130.00 Max. :145.00 Max. :157.00
## x.25 x.26 x.27 x.28
## Min. : 39.00 Min. : 27.00 Min. : 50.00 Min. : 29.00
## 1st Qu.: 60.00 1st Qu.: 71.00 1st Qu.: 85.00 1st Qu.: 69.00
## Median : 68.00 Median : 85.00 Median :100.00 Median : 81.00
## Mean : 69.16 Mean : 83.37 Mean : 99.21 Mean : 82.66
## 3rd Qu.: 79.00 3rd Qu.:103.00 3rd Qu.:113.00 3rd Qu.: 92.00
## Max. :104.00 Max. :131.00 Max. :140.00 Max. :154.00
## x.29 x.30 x.31 x.32
## Min. : 39.00 Min. : 27.00 Min. : 50.00 Min. : 29.00
## 1st Qu.: 60.00 1st Qu.: 71.00 1st Qu.: 85.00 1st Qu.: 69.00
## Median : 68.00 Median : 85.00 Median :100.00 Median : 81.00
## Mean : 68.94 Mean : 83.15 Mean : 99.11 Mean : 82.62
## 3rd Qu.: 79.00 3rd Qu.:103.00 3rd Qu.:113.00 3rd Qu.: 92.00
## Max. :104.00 Max. :130.00 Max. :145.00 Max. :157.00
## x.33 x.34 x.35 x.36
## Min. : 39.00 Min. : 27.00 Min. : 50.00 Min. : 29.00
## 1st Qu.: 60.00 1st Qu.: 71.00 1st Qu.: 85.00 1st Qu.: 68.00
## Median : 67.00 Median : 84.00 Median :100.00 Median : 81.00
## Mean : 68.73 Mean : 82.86 Mean : 98.93 Mean : 82.51
## 3rd Qu.: 79.00 3rd Qu.:103.00 3rd Qu.:113.00 3rd Qu.: 92.00
## Max. :104.00 Max. :130.00 Max. :145.00 Max. :157.00
## classes
## red soil :1533
## cotton crop : 703
## grey soil :1358
## damp grey soil : 626
## vegetation stubble : 707
## very damp grey soil:1508
```

```
# exibir alguns dados do Satellite
head(Satellite, n = 6)
```

```
## x.1 x.2 x.3 x.4 x.5 x.6 x.7 x.8 x.9 x.10 x.11 x.12 x.13 x.14 x.15 x.16 x.17
## 1 92 115 120 94 84 102 106 79 84 102 102 83 101 126 133 103 92
## 2 84 102 106 79 84 102 102 83 80 102 102 79 92 112 118 85 84
## 3 84 102 102 83 80 102 102 79 84 94 102 79 84 103 104 81 84
## 4 80 102 102 79 84 94 102 79 80 94 98 76 84 99 104 78 84
## 5 84 94 102 79 80 94 98 76 80 102 102 79 84 99 104 81 76
## 6 80 94 98 76 80 102 102 79 76 102 102 79 76 99 104 81 76
## x.18 x.19 x.20 x.21 x.22 x.23 x.24 x.25 x.26 x.27 x.28 x.29 x.30 x.31 x.32
## 1 112 118 85 84 103 104 81 102 126 134 104 88 121 128 100
## 2 103 104 81 84 99 104 78 88 121 128 100 84 107 113 87
## 3 99 104 78 84 99 104 81 84 107 113 87 84 99 104 79
## 4 99 104 81 76 99 104 81 84 99 104 79 84 99 104 79
## 5 99 104 81 76 99 108 85 84 99 104 79 84 103 104 79
## 6 99 108 85 76 103 118 88 84 103 104 79 79 107 109 87
## x.33 x.34 x.35 x.36 classes
## 1 84 107 113 87 grey soil
## 2 84 99 104 79 grey soil
## 3 84 99 104 79 grey soil
```

## 4	84	103	104	79	grey soil
## 5	79	107	109	87	grey soil
## 6	79	107	109	87	grey soil