

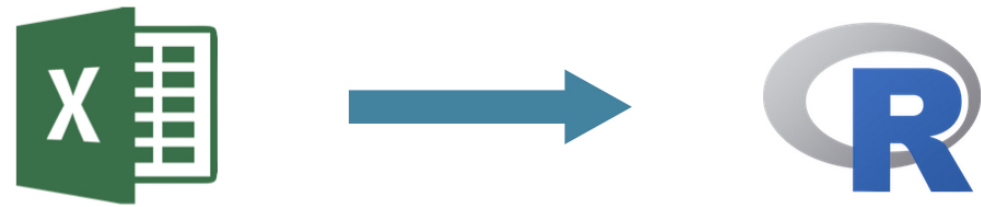
Introduction & read.csv

INTRODUCTION TO IMPORTING DATA IN R

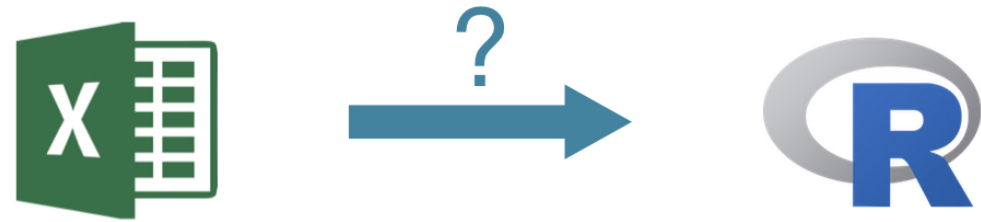


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Importing data in R



Importing data in R




5 types

5 types

- Flat files



5 types

- Flat files
- Data from Excel 

5 types

- Flat files



- Data from Excel 

- Databases 


5 types

- Flat files

- Data from Excel 



- Databases 


- Web

5 types

- Flat files

- Data from Excel 

- Databases 




- Web

- Statistical software 
 

5 types

- Flat files

- Data from Excel 

- Databases 


- Web

- Statistical software 
 



Flat files

```
states.csv
```

```
state,capital,pop_mill,area_sqm
South Dakota,Pierre,0.853,77116
New York,Albany,19.746,54555
Oregon,Salem,3.970,98381
Vermont,Montpelier,0.627,9616
Hawaii,Honolulu,1.420,10931
```

```
wanted_df
```

```
   state capital pop_mill area_sqm
1 South Dakota  Pierre    0.853   77116
2   New York    Albany   19.746   54555
3    Oregon     Salem    3.970   98381
4   Vermont Montpelier    0.627    9616
5    Hawaii  Honolulu    1.420   10931
```

utils - read.csv

- Loaded by default when you start R

```
read.csv("states.csv", stringsAsFactors = FALSE)
```

- What if file in datasets folder of home directory?

```
path <- file.path("~", "datasets", "states.csv")  
path
```

```
"~/datasets/states.csv"
```

```
read.csv(path, stringsAsFactors = FALSE)
```

read.csv()

```
read.csv("states.csv", stringsAsFactors = FALSE)
```

	state	capital	pop_mill	area_sqm
1	South Dakota	Pierre	0.853	77116
2	New York	Albany	19.746	54555
3	Oregon	Salem	3.970	98381
4	Vermont	Montpelier	0.627	9616
5	Hawaii	Honolulu	1.420	10931

```
df <- read.csv("states.csv", stringsAsFactors = FALSE)
str(df)
```

```
'data.frame':    5 obs. of  4 variables:
 $ state      : chr  "South Dakota" "New York" "Oregon" "Vermont" ...
 $ capital    : chr  "Pierre" "Albany" "Salem" "Montpelier" ...
 $ pop_mill   : num  0.853 19.746 3.97 0.627 1.42
 $ area_sqm   : int  77116 54555 98381 9616 10931
```

Let's practice!

INTRODUCTION TO IMPORTING DATA IN R

read.delim & read.table

INTRODUCTION TO IMPORTING DATA IN R



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Tab-delimited file

```
states.txt
```

```
state    capital pop_mill    area_sqm
South Dakota    Pierre  0.853    77116
New York    Albany  19.746   54555
Oregon    Salem  3.970    98381
Vermont Montpelier  0.627    9616
Hawaii    Honolulu 1.420    10931
```

```
read.delim("states.txt", stringsAsFactors = FALSE)
```

```
      state    capital pop_mill area_sqm
1 South Dakota    Pierre  0.853    77116
2   New York    Albany  19.746   54555
3    Oregon    Salem  3.970    98381
4   Vermont Montpelier  0.627    9616
5    Hawaii    Honolulu 1.420    10931
```


Exotic file format

```
states2.txt
```

```
state/capital/pop_mill/area_sqm
```

```
South Dakota/Pierre/0.853/77116
```

```
New York/Albany/19.746/54555
```

```
Oregon/Salem/3.970/98381
```

```
Vermont/Montpelier/0.627/9616
```

```
Hawaii/Honolulu/1.420/10931
```

read.table()

- Read any tabular file as a data frame
- Number of arguments is huge

```
read.table("states2.txt",  
           header = TRUE,  
           sep = "/",  
           stringsAsFactors = FALSE)
```

	state	capital	pop_mill	area_sqm
1	South Dakota	Pierre	0.853	77116
2	New York	Albany	19.746	54555
3	Oregon	Salem	3.970	98381
4	Vermont	Montpelier	0.627	9616
5	Hawaii	Honolulu	1.420	10931

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Final Thoughts

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Wrappers

- `read.table()` is the main function
- `read.csv()` = wrapper for CSV
- `read.delim()` = wrapper for tab-delimited files

read.csv

```
states.csv
```

```
state,capital,pop_mill,area_sqm  
South Dakota,Pierre,0.853,77116  
New York,Albany,19.746,54555  
Oregon,Salem,3.970,98381  
Vermont,Montpelier,0.627,9616  
Hawaii,Honolulu,1.420,10931
```

- Defaults
 - header = TRUE
 - sep = ","

```
read.table("states.csv", header = TRUE, sep = ",", stringsAsFactors = FALSE)
```

```
read.csv("states.csv", stringsAsFactors = FALSE)
```

read.delim

states.txt

```
state    capital pop_mill    area_sqm
South Dakota    Pierre  0.853    77116
New York    Albany  19.746   54555
Oregon    Salem  3.970    98381
Vermont Montpelier  0.627    9616
Hawaii    Honolulu  1.420    10931
```

- Defaults
 - header = TRUE
 - sep = "\t"

```
read.table("states.txt", header = TRUE, sep = "\t", stringsAsFactors = FALSE)
```

```
read.delim("states.txt", stringsAsFactors = FALSE)
```

Documentation

?read.table

Description

Reads a file in table format and creates a data frame from it, with cases corresponding to lines and variables to fields in the file.

Usage

```
read.table(file, header = FALSE, sep = "", quote = "\"'",  
           dec = ".", numerals = c("allow.loss", "warn.loss", "no.loss"),  
           row.names, col.names, as.is = !stringsAsFactors,  
           na.strings = "NA", colClasses = NA, nrows = -1,  
           skip = 0, check.names = TRUE, fill = !blank.lines.skip,  
           strip.white = FALSE, blank.lines.skip = TRUE,  
           comment.char = "#",  
           allowEscapes = FALSE, flush = FALSE,  
           stringsAsFactors = default.stringsAsFactors(),  
           fileEncoding = "", encoding = "unknown", text, skipNul = FALSE)
```

```
read.csv(file, header = TRUE, sep = ",", quote = "\"",  
         dec = ".", fill = TRUE, comment.char = "", ...)
```

```
read.csv2(file, header = TRUE, sep = ";", quote = "\"",  
          dec = ",", fill = TRUE, comment.char = "", ...)
```

```
read.delim(file, header = TRUE, sep = "\t", quote = "\"",  
           dec = ".", fill = TRUE, comment.char = "", ...)
```

```
read.delim2(file, header = TRUE, sep = "\t", quote = "\"",  
            dec = ",", fill = TRUE, comment.char = "", ...)
```


Locale differences

```
states_aye.csv
```

```
state,capital,pop_mill,area_sqm  
South Dakota,Pierre,0.853,77116  
New York,Albany,19.746,54555  
Oregon,Salem,3.970,98381  
Vermont,Montpelier,0.627,9616  
Hawaii,Honolulu,1.420,10931
```

```
states_nay.csv
```

```
state;capital;pop_mill;area_sqm  
South Dakota;Pierre;0,853;77116  
New York;Albany;19,746;54555  
Oregon;Salem;3,97;98381  
Vermont;Montpelier;0,627;9616  
Hawaii;Honolulu;1,42;10931
```

Locale differences

```
read.csv(file, header = TRUE, sep = ",", quote = "\"",  
         dec = ".", fill = TRUE, comment.char = "", ...)
```

```
read.csv2(file, header = TRUE, sep = ";", quote = "\"",  
          dec = ",", fill = TRUE, comment.char = "", ...)
```

```
read.delim(file, header = TRUE, sep = "\t", quote = "\"",  
           dec = ".", fill = TRUE, comment.char = "", ...)
```

```
read.delim2(file, header = TRUE, sep = "\t", quote = "\"",  
            dec = ",", fill = TRUE, comment.char = "", ...)
```

states_nay.csv

```
read.csv("states_nay.csv", stringsAsFactors = FALSE)
```

```
state.capital.pop_mill.area_sqm
South Dakota;Pierre;0          853;77116
New York;Albany;19             746;54555
Oregon;Salem;3                 97;98381
Vermont;Montpelier;0           627;9616
Hawaii;Honolulu;1              42;10931
```

```
read.csv2("states_nay.csv", stringsAsFactors = FALSE)
```

```
state capital pop_mill area_sqm
1 South Dakota Pierre 0.853 77116
2 New York Albany 19.746 54555
3 Oregon Salem 3.970 98381
4 Vermont Montpelier 0.627 9616
5 Hawaii Honolulu 1.420 10931
```

Let's practice!

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