readr: read_csv & read_tsv

INTRODUCTION TO IMPORTING DATA IN R

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Overview

- Before: utils package
- Specific R packages
  - readr
  - data.table

readr

- Hadley Wickham
- Fast, easy to use, consistent
- utils: verbose, slower

```
install.packages("readr")
library(readr)
```

CSV files

```
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
```

```
read_csv("states.csv")
```

```
# A tibble: 5 × 4
         state    capital pop_mill area_sqm
         <chr>      <chr>    <dbl>    <int>
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
```

TSV files

```
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
```

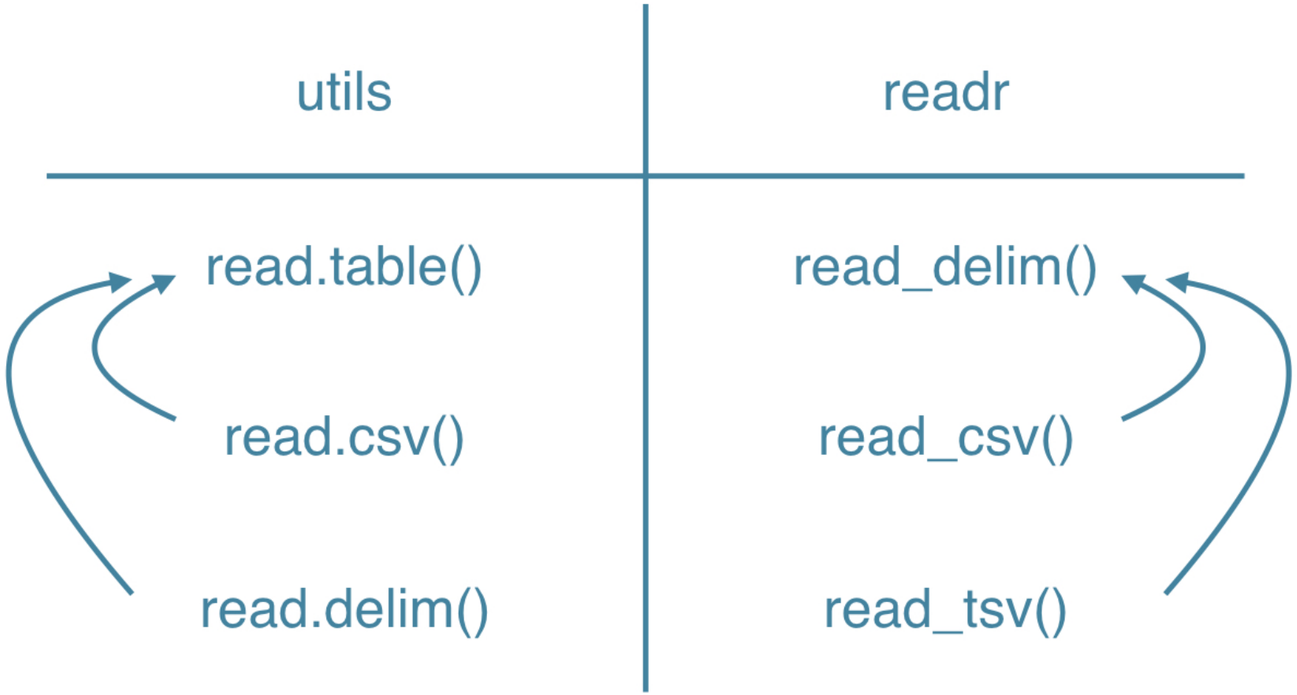
```
read_tsv("states.txt")
```

```
# A tibble: 5 × 4
         state    capital pop_mill area_sqm
         <chr>      <chr>    <dbl>    <int>
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
```

Wrapping in utils and readr

utils	readr
read.table()	read_delim()
read.csv()	read_csv()
read.delim()	read_tsv()

Wrapping in utils and readr



Let's practice!

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readr: read_delim

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states2.txt

```
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
```

states2.txt

```
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
```

```
read_delim("states2.txt", delim = "/")
```

```
# A tibble: 5 x 4
         state    capital pop_mill area_sqm
         <chr>      <chr>    <dbl>    <int>
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
```

col_names

```
states3.txt


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
```

col_names

```
read_delim("states3.txt", delim = "/", col_names = FALSE)
```

```
          X1           X2     X3    X4
       <chr>        <chr>  <dbl> <int>
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
```

```
read_delim("states3.txt", delim = "/",
           col_names = c("state", "city", "pop", "area"))
```

```
        state       city    pop  area
        <chr>       <chr>  <dbl> <int>
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
```

col_types

```
read_delim("states2.txt", delim = "/")
```

```
         state    capital pop_mill area_sqm
         <chr>      <chr>    <dbl>    <int>
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
```

```
read_delim("states2.txt", delim = "/", col_types = "ccdd")
```

```
         state    capital pop_mill area_sqm
         <chr>      <chr>    <dbl>    <dbl>
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
```

skip and n_max

```
read_delim("states2.txt", delim = "/",
             skip = 2, n_max = 3)
```

```
# A tibble: 3 x 4
  New York     Albany 19.746 54555
     <chr>      <chr>  <dbl> <int>
1   Oregon      Salem  3.970 98381
2  Vermont Montpelier  0.627  9616
3   Hawaii   Honolulu  1.420 10931
```

```
read_delim("states2.txt", delim = "/",
             col_names = c("state", "city", "pop", "area"),
             skip = 2, n_max = 3)
```

```
# A tibble: 3 x 4
     state       city    pop  area
     <chr>      <chr>  <dbl> <int>
1 New York     Albany 19.746 54555
2   Oregon      Salem  3.970 98381
3  Vermont Montpelier  0.627  9616
```

Let's practice!

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data.table: fread

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data.table

- Matt Dowle & Arun Srinivasan
- Key metric: speed
- Data manipulation in R
- Function to import data: fread()

```
install.packages("data.table")
library(data.table)
```

    - Similar to read.table()

fread()

```
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
```

```
states2.csv

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
```

fread()

```
fread("states.csv")
```

```
          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
```

```
fread("states2.csv")
```

```
            V1         V2     V3    V4
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
```

fread()

- Infer column types and separators
- It simply works
- Extremely fast
- Possible to specify numerous parameters
- Improved read.table()
- Fast, convenient, customizable

Let's practice!

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