

# Package ‘mdsr’

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**Title** Complement to 'Modern Data Science with R'

**Version** 0.2.3

**Description** A complement to \*Modern Data Science with R\* (ISBN: 978-1498724487, publisher URL: <<https://www.routledge.com/Modern-Data-Science-with-R/Baumer-Kaplan-Horton/p/book/9781498724487>>). This package contains data and code to complete exercises and reproduce examples from the text. It also facilitates connections to the SQL database server used in the book. Both version of the book are supported by this package.

**Depends** R (>= 3.5.0)

**License** CC0

**LazyData** true

**Imports** babynames, DBI, dbplyr, downloader, dplyr, fs, ggplot2, htmlwidgets, kableExtra, RMySQL, skimr, stringr, tibble, webshot

**Suggests** knitr, Lahman, leaflet, etl, macleish, mosaic, mosaicData, lubridate, sf, testthat, utf8

**RoxygenNote** 7.1.1

**Encoding** UTF-8

**URL** <https://github.com/beanumber/mdsr>

**BugReports** <https://github.com/beanumber/mdsr/issues>

**NeedsCompilation** no

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---

 Cherry

*Cherry Blossom runs*


---

**Description**

Cherry Blossom runs

**Usage**

Cherry

**Format**

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 41,248 rows and 8 columns. Each row refers to an individual runner in one race of the Cherry Blossom Ten Miler. The data cover the years 1999 to 2008. All of the runners listed ran at least two of the races in that period, some ran many more than that.

**name.yob** a unique identifier for each runner composed of the runner's full name and year of birth.

**age** integer giving the runner's age in the race whose result is being reported.

**gun** the number of minutes elapsed from the starter's gun to the person crossing the finish line

**net** the number of minutes elapsed from the runner's crossing the start line to crossing the finish line.

**sex** the runner's sex

**year** the year of that race

**previous** integer specifying how many times previous to this race the runner had participated in the years 1999 to 2008.

**nruns** integer giving the total number of times that runner participated in the years from 1999 to 2008. The smallest is 2, the largest is 10.

**nruns** integer giving the total number of times that runner participated in the years from 1999 to 2008. The smallest is 2, the largest is 10.

**Details**

The Cherry Blossom 10 Mile Run is a road race held in Washington, D.C. in April each year. (The name comes from the famous cherry trees that are in bloom in April in Washington.) The results of this race are published at [http://www.cherryblossom.org/aboutus/results\\_list.php](http://www.cherryblossom.org/aboutus/results_list.php).

**Examples**

```
with(Cherry, table(table(name.yob)))
```

---

CholeraDeaths

*Deaths and Pumps from 1854 London cholera outbreak*

---

**Description**

Deaths and Pumps from 1854 London cholera outbreak

**Usage**

CholeraDeaths

CholeraPumps

**Format**

An object of class `sf` whose data attribute has 250 rows and 2 columns.

An object of class `sf`.

**Details**

Both spatial objects are projected in EPSG:27700, aka the British National Grid.

**Source**

<http://blog.rtwilson.com/john-snows-cholera-data-in-more-formats/>

**Examples**

```
if (require(sf)) {
  plot(st_geometry(CholeraDeaths))
}
```

---

CIACountries

*Several variables on countries from the CIA Factbook, 2014.*

---

**Description**

The CIA Factbook has geographic, demographic, and economic data on a country-by-country basis. In the description of the variables, the 4-digit number indicates the code used to specify that variable on the data and documentation web site.

**Usage**

CIACountries

**Format**

A data frame with the following variables for each of the Countries in the World. (236 countries are given.)

**country** Name of the country

**pop** number of people, 2119

**area** area (sq km), 2147

**oil\_prod** Crude oil - production (bbl/day), 2241

**gdp** Gross Domestic Product per capita (\$/person), 2001

**educ** education spending (% of GDP), 2206

**roadways** Roadways per unit area (km/sq km), 2085

**net\_users** Fraction of Internet users (% of population), 2153

**Source**

From the CIA World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/>

**References**

<https://github.com/factbook/factbook/blob/master/data/categories.csv>

**See Also**

[CIAdata](#)

**Examples**

```
str(CIACountries)
```

---

DataSciencePapers

*Data Science Papers from arXiv.org*

---

**Description**

Papers matching the search string "Data Science" on arXiv.org in August, 2020

**Usage**

```
DataSciencePapers
```

**Format**

A data frame with 1089 observations on the following 15 variables.

**id** unique arXiv.org identifier for the paper

**submitted** date submitted

**updated** date last updated

**title** title of the paper

**abstract** contents of the abstract

**authors** authors of the paper

**affiliations** affiliations of the authors

**link\_abstract** direct link to the abstract

**link\_pdf** direct link to the pdf

**link\_doi** direct link to the digital object identifier (doi)

**comment** commentary

**journal\_ref** reference to the journal (if published)

**doi** digital object identifier

**primary\_category** arXiv.org primary category

**categories** arXiv.org categories

**Source**

<https://arxiv.org/>

**Examples**

```
data(DataSciencePapers)
str(DataSciencePapers)
```

---

Elections

*Election Statistics*

---

**Description**

Election Statistics

**Usage**

Elections

**Format**

An object of class `\codetbl_df` (inherits from `\codetbl`, `\codedata.frame`) with 117 rows and 13 columns.

**Ward** Name of the country

**Precinct** number of people, 2119

**Registered.Voters.at.7am** area (sq km), 2147

**Voters.Registering.at.Polls** Crude oil - production (bbl/day), 2241

**gdp** Gross Domestic Product per capita (\$/person), 2001

**educ** education spending (% of GDP), 2206

**roadways** Roadways per unit area (km/sq km), 2085

**net\_users** Fraction of Internet users (% of population), 2153

---

Emails_train	<i>Email Train</i>
--------------	--------------------

---

## Description

The training dataset includes a set of email subject lines used for classification of whether the message is spam (unsolicited commercial content) or not. Many subject lines include subject matter inappropriate for classroom use. Given the volume of headlines containing such language (especially for spam == TRUE), user discretion is advised. This dataset is a random sample of 80% of the emails data.

The testing dataset is a random sample of 20% of the emails data.

## Usage

```
Emails_train
```

```
Emails_test
```

## Format

A data frame with 5,526 rows and 3 variables:

**ids** an integer vector

**subjectline** a character vector

**type** a character vector

A data frame with 1,382 rows and 3 variables:

## Source

<http://www.rdatasciencecases.org/Data.html>

## Examples

```
nrow(Emails_train)
nrow(Emails_test)
```

---

etl_NCI60	<i>Load the NCI60 data from GitHub</i>
-----------	--

---

**Description**

Load the NCI60 data from GitHub

**Usage**

```
etl_NCI60()
```

**Examples**

```
## Not run:  
NCI60 <- etl_NCI60()  
  
## End(Not run)
```

---

Headlines_train	<i>Headlines_train</i>
-----------------	------------------------

---

**Description**

This data comes from Chakraborty et. al., which combines headlines from a variety of news and clickbait sources. Some headlines contain subject matter inappropriate for classroom use. Given the volume of headlines containing such language (especially for `clickbait == TRUE`), this filtering might not catch all problematic headlines. User discretion is advised. The training dataset is a random sample of approximately 80% of the observations from the original dataset.

The testing dataset is a random sample of the remaining 20% of the observations not found in the training set.

**Usage**

```
Headlines_train
```

```
Headlines_test
```

**Format**

A data frame with 18,360 rows and 3 variables:

**title** a character vector

**clickbait** a logical vector

**ids** an integer vector

A data frame with 4,589 rows and 3 variables:



**Source**

<https://github.com/bhargaviparanjape/clickbait/>

**References**

<https://doi.org/10.1109/ASONAM.2016.7752207>

**Examples**

```
nrow(Headlines_train)
nrow(Headlines_test)
```

---

Macbeth_raw	<i>Text of Macbeth</i>
-------------	------------------------

---

**Description**

The entire text of Macbeth, stored in a character vector of length 1.

**Usage**

```
Macbeth_raw
```

**Format**

A character vector of length 1

**Source**

Project Gutenberg, <https://www.gutenberg.org/ebooks/1129/>

---

macros	<i>Replacements for LaTeX macros</i>
--------	--------------------------------------

---

**Description**

Replacements for LaTeX macros

**Usage**

```
func(x, index = TRUE)

sql_func(x)

sql_word(x)

argument(x)

variable(x)

pkg(x, index = TRUE)

mdsr_data(x)

mdsr_person(x)

vocab(x)

index_entry(index_label = "subject", x)
```

**Arguments**

x	text to wrap in macro
index	add LaTeX indexing?
index_label	the name of the index

---

make_babynames_dist	<i>Wrangle babynames data</i>
---------------------	-------------------------------

---

**Description**

Wrangle babynames data

**Usage**

```
make_babynames_dist()
```

**Value**

a `tbl_df` similar to `babynames` with a column for the estimated number of people alive in 2014.

## Examples

```
BabynameDist <- make_babynames_dist()
if (require(dplyr)) {
  BabynameDist %>%
    filter(name == "Benjamin")
}
```

---

mdsr_table	<i>Custom table output</i>
------------	----------------------------

---

## Description

Custom table output

## Usage

```
mdsr_table(x, ...)

mdsr_sql_explain_table(x, ...)

mdsr_sql_keys_table(x, ...)
```

## Arguments

x	A data.frame
...	arguments passed to <a href="#">kbl</a>

## Examples

```
mdsr_table(faithful)
```

---

MedicareCharges	<i>Charges to and Payments from Medicare</i>
-----------------	--

---

## Description

These data for 2011, released in May 2013, describe how much hospitals charged Medicare for various inpatient procedures, how many were performed, and how much Medicare actually paid.

## Usage

```
MedicareCharges
```

**Format**

A data frame with 5,025 observations on the following 4 variables.

**drg** Code for the Diagnosis Related Group: a character string that looks like a number.

**stateProvider** the state providing the care.

**num\_charges** the total number of charges.

**mean\_charge** the average charge for each drg across each state

**Details**

These data are part of a set with `DiagnosisRelatedGroup`, which gives a description of the medical procedure associated with each DRG, and `MedicareProviders`, which translates `idProvider` into a name, address, state, Zip, etc..

These data have been pre-aggregated by state.

**Source**

Data from the Centers for Medicare and Medicaid Services. See <https://www.cms.gov/Research-Statistics-Data-and-Statistics-Trends-and-Reports/Medicare-Provider-Charge-Data/Inpatient>.

**References**

[https://hmsa.com/portal/provider/zav\\_pel.fh.DIA.650.htm](https://hmsa.com/portal/provider/zav_pel.fh.DIA.650.htm)

**See Also**

[MedicareProviders](#)

**Examples**

```
data(MedicareCharges)
```

---

MedicareProviders

*Medicare Providers*

---

**Description**

Name and location data for the medicare providers in the MedicareCharges data table.

**Usage**

```
MedicareProviders
```

**Format**

A data frame with 3337 observations on the following 7 variables.

**idProvider** a unique number assigned to each provider

**nameProvider** Name of the provider. (text string)

**addressProvider** Street address of the provider. (text string)

**cityProvider** The name of the city in which the provider is located. (factor)

**stateProvider** The two-letter postal code of the state in which the provider is located. (factor)

**zipProvider** The provider's ZIP code. (factor)

**referralRegion** An identifier for the region serviced by the provider.

**Details**

This data table is related to MedicareCharges data.

**Source**

Extracted from the highly repetitive table provided by the Centers for Medicare and Medicaid Services. See <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Provider-Charge-Data/Inpatient>

**See Also**

[MedicareCharges](#)

**Examples**

```
data(MedicareProviders)
```

---

Minneapolis2013

*Ballots in the 2013 Mayoral election in Minneapolis*

---

**Description**

The choices marked on each (valid) ballot for the election, which was run using a rank-choice, instant runoff system.

**Usage**

```
Minneapolis2013
```

**Format**

A data frame with 80,101 observations on the following 5 variables. All are stored as character strings.

**Precinct** Precincts are sub-divisions within Wards

**First** The voter's first choice

**Second** The voter's second choice

**Third** The voter's third choice

**Ward** The city is divided spatially into districts or 'wards'. These are further subdivided into precincts.

**Details**

Ballot information for the 2013 Minneapolis Mayoral election, which was run as a rank-choice election. In rank-choice, a voter can indicate first, second, and third choices. If a voter's first choice is eliminated (by being last in the count across voters), the second choice is promoted to that voter's first choice, and similarly third -> second. Eliminations are done successively until one candidate has a majority of the first-choice votes.

**Source**

Ballot data from the Minneapolis city government: <https://vote.minneapolismn.gov/results-data/election-results/2013/mayor/>

**References**

Description of ranked-choice voting: <https://vote.minneapolismn.gov/ranked-choice-voting/>

A Minnesota Public Radio story about the election ballot tallying process: <https://minnesota.publicradio.org/display/web/2013/11/22/politics/ranked-choice-vote-count-programmers/>

The Wikipedia article about the election: [https://en.wikipedia.org/wiki/2013\\_Minneapolis\\_mayoral\\_election](https://en.wikipedia.org/wiki/2013_Minneapolis_mayoral_election)

**Examples**

```
data(Minneapolis2013)
```

---

MLB\_teams

*Data about recent major league baseball teams*

---

**Description**

A dataset containing information about Major League Baseball teams from 2008-2014.

**Usage**

```
MLB_teams
```

**Format**

A `tbl_df` object.

**yearID** season in which the team played

**teamID** the team's three character identifier

**lgID** the league in which the team played

**W** number of wins

**L** number of losses

**WPct** winning percentage

**attendance** number of fans in attendance

**normAttend** number of fans in attendance, relative to the team with the highest attendance in this sample (the 2008 New York Yankees)

**payroll** the sum of the salaries of the players on each team. Note that this number is only an estimate of the actual team payroll – and may not even be a very good one. Salaries are accumulated from [Salaries](#)

**metroPop** the size of the team's home city's metropolitan population, according to Wikipedia and the 2010 US Census

**name** the full name of the team

**Source**

The [Teams](#) table from [Lahman-package](#) and [https://en.wikipedia.org/wiki/List\\_of\\_Metropolitan\\_Statistical\\_Areas](https://en.wikipedia.org/wiki/List_of_Metropolitan_Statistical_Areas)

**See Also**

[Teams](#)

---

NCI60\_tiny

*Gene expression in cancer*

---

**Description**

The data come from a National Cancer Institute study of gene expression in cell lines drawn from various sorts of cancer.

**Usage**

NCI60\_tiny

Cancer

**Format**

The expression data, `NCI60_tiny` is a dataframe of 41,078 gene probes (rows) and 60 cell lines (columns). The first column, `Probe` gives the name of the Agilent microarray probe. Each of the remaining columns is named for a cell line. The value is the log-2 expression associated with that probe for the cell line.

**Probe** the name of the Agilent microarray probe

For Cancer:

**otherCellLine** a character vector giving the name of one cell line

**cellLine** a character vector giving the name of another cell line

**correlation** the correlation between the two cell lines. See `cor`

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 1770 rows and 3 columns.

**Details**

[Cancer](#) gives information about each cell line.

**References**

Staunton et al. (<https://www.pnas.org/content/98/19/10787.full>)

D.T. Ross et al. (2000) Nature Genetics, 24(3):227-234 ([https://discover.nci.nih.gov/host/2000\\_systematic\\_abstract.jsp](https://discover.nci.nih.gov/host/2000_systematic_abstract.jsp))

**See Also**

[Cancer](#)

**Examples**

```
data(NCI60_tiny)
```

---

ordway\_birds

*Birds captured and released at Ordway, complete and uncleaned*

---

**Description**

The historical record of birds captured and released at the Katharine Ordway Natural History Study Area, a 278-acre preserve in Inver Grove Heights, Minnesota, owned and managed by Macalester College.

**Usage**

```
ordway_birds
```



**Format**

A data frame with 15,829 observations on the bird's species, size, date found, and band number.

bogus a character vector

Timestamp Timestamp indicates when the data were entered into an electronic record, not anything about the bird being described

Year a character vector

Day a character vector

Month a character vector

CaptureTime a character vector

SpeciesName a character vector

Sex a character vector

Age a character vector

BandNumber a character vector

TrapID a character vector

Weather a character vector

BandingReport a character vector

RecaptureYN a character vector

RecaptureMonth a character vector

RecaptureDay a character vector

Condition a character vector

Release a character vector

Comments a character vector

DataEntryPerson a character vector

Weight a character vector

WingChord a character vector

Temperature a character vector

RecaptureOriginal a character vector

RecapturePrevious a character vector

TailLength a character vector

Timestamp indicates when the data were entered into an electronic record, not anything about the bird being described.

**Details**

There are many extraneous levels of variables such as species. Part of the purpose of this data set is to teach about data cleaning.

**Source**

Jerald Dosch, Dept. of Biology, Macalester College: the manager of the Study Area.

**References**

<https://www.macalester.edu/ordway/>

**Examples**

ordway\_birds

---

Rnw2Rmd

*Convert Rnw to Rmd*

---

**Description**

Convert Rnw to Rmd

**Usage**

Rnw2Rmd(path, new\_path = NULL)

**Arguments**

path	A character vector of one or more paths.
new_path	New file path. If new_path is existing directory, the file will be moved into that directory; otherwise it will be moved/renamed to the full path. Should either be the same length as path, or a single directory.

---

SAT\_2010

*State SAT scores from 2010*

---

**Description**

SAT results by state for 2010

**Usage**

SAT\_2010

**Format**

A data.frame with 50 rows and 9 variables.

state a factor with levels for each state

expenditure average expenditure per student (in each state)

pupil\_teacher\_ratio pupil to teacher ratio in that state

salary teacher salary (in 2010 US \$)

read state average Reading SAT score

math state average Math SAT score

write state average Writing SAT score

total state average Total SAT score

sat\_pct percent of students taking SAT in that state

**Details**

See also the earlier [SAT](#) dataset.

**See Also**

[SAT](#)

---

save\_webshot

*Embedded webshot of leaflet map*

---

**Description**

Embedded webshot of leaflet map

**Usage**

```
save_webshot(  
  map,  
  path_to_img,  
  overwrite = FALSE,  
  vwidth = 800,  
  vheight = 600,  
  cliprect = "viewport",  
  ...  
)
```

**Arguments**

map	A leaflet map object
path_to_img	A path to the image file to save
overwrite	Do you want to clobber any existing file?
vwidth	see <a href="#">webshot</a>
vheight	see <a href="#">webshot</a>
cliprect	see <a href="#">webshot</a>
...	arguments passed to <a href="#">webshot</a>

**Value**

a path to a PNG file

**Examples**

```
## Not run:
if (require(leaflet)) {
  map <- leaflet() %>%
    addTiles() %>%
    addMarkers(lng = 174.768, lat = -36.852, popup = "The birthplace of R")
  save_webshot(map, tempfile())
}

## End(Not run)
```

---

skim	<i>Custom skimmer</i>
------	-----------------------

---

**Description**

Custom skimmer

**Usage**

```
skim(data, ...)
```

**Arguments**

data	A tibble, or an object that can be coerced into a tibble.
...	Columns to select for skimming. When none are provided, the default is to skim all columns.

**Examples**

```
skim(faithful)
```

---

src_scidb	<i>src_scidb</i>
-----------	------------------

---

### Description

Connect to the scidb server at Smith College.

### Usage

```
src_scidb(dbname, ...)
```

```
dbConnect_scidb(dbname, ...)
```

```
mysql_scidb(dbname, ...)
```

### Arguments

dbname	the name of the database to which you want to connect
...	arguments passed to <a href="#">src_dbi</a> or <a href="#">dbConnect</a>

### Details

This is a public, read-only account. Any abuse will be considered a hostile act.

### Value

For [src\\_scidb](#), a [src\\_dbi](#) object

For [dbConnect\\_scidb](#), a [DBIConnection-class](#) object

For [mysql\\_scidb](#), a character vector of length 1 to be used as an `engine.opts` argument, or on the command line.

### See Also

[src\\_dbi](#)

[DBIConnection-class](#)

[opts\\_chunk](#)

### Examples

```
dbAir <- src_scidb("airlines")
dbAir
dbAir <- dbConnect_scidb("airlines")
dbAir

if (require(knitr)) {
  opts_chunk$set(engine.opts = mysql_scidb("airlines"))
}
```

---

`theme_mdsr`*MDSR themes*

---

**Description**

Graphical themes used in MDSR book

**Usage**

```
theme_mdsr(base_size = 12, base_family = "Bookman")
```

**Arguments**

`base_size`      base font size, given in pts.

`base_family`    base font family

**Examples**

```
if (require(ggplot2)) {  
  p <- ggplot(mtcars, aes(x = hp, y = mpg, color = factor(cyl))) +  
    geom_point() + facet_wrap(~ am) + geom_smooth()  
  p + theme_grey()  
  p + theme_mdsr()  
}
```

---

`Violations`*NYC Restaurant Health Violations*

---

**Description**

NYC Restaurant Health Violations

**Usage**

`Violations`

`ViolationCodes`

`Cuisines`

**Format**

A data frame with 480,621 observations on the following 16 variables.

camis unique identifier  
dba full name doing business as  
boro borough of New York  
building building name  
street street address  
zipcode zipcode  
phone phone number  
inspection\_date inspection date  
action action taken  
violation\_code violation code, see [ViolationCodes](#)  
score inspection score  
grade inspection grade  
grade\_date grade date  
record\_date recording date  
inspection\_type inspect type  
cuisine\_code cuisine code, see [Cuisines](#)

A data frame with 174 observations on the following 3 variables.

violation\_code a factor with many levels  
critical\_flag is violation critical: a factor with levels N Y  
violation\_description violation description

A data frame with 84 observations on the following 2 variables.

cuisine\_code a character vector  
cuisine\_description a character vector

**Source**

NYC Open Data, <https://data.cityofnewyork.us/Health/DOHMH-New-York-City-Restaurant-Inspection-Results/43nn-pn8j/>

**See Also**

[ViolationCodes](#), [Cuisines](#)

**Examples**

```

data(Violations)
if (require(dplyr)) {
  Violations %>%
    inner_join(Cuisines, by = "cuisine_code") %>%
    filter(cuisine_description == "American") %>%
    arrange(grade_date) %>%
    head()
}

```

---

Votes

*Votes from Scottish Parliament*

---

**Description**

Votes recorded on each ballot by each member of the Scottish Parliament in 2008 along with information about party affiliation.

**Usage**

Votes

Parties

**Format**

Votes is a data.frame with 103582 rows and 3 variables.

bill an identifier for the bill

name the name of the member of parliament

vote 1 means a vote for, -1 a vote against. 0 is an abstention.

Parties is a data.frame with 134 rows, one for each member of parliament, and 2 variables.

party the name of the political party the member belongs to

name the name of the member of parliament

An object of class data.frame with 134 rows and 2 columns.

**Details**

Almost all of the members of parliament belongs to a political party. This table identifies that party. These data were provided by Caroline Ettinger and form part of her senior honor's project at Macalester College. Prof. Andrew Beveridge supervised the thesis. Ms. Ettinger used the vote data to explore how to extract the party association of members purely from voting records. The Parties data was used to evaluate the success of methods.



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world_cities	<i>Cities and their populations</i>
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**Description**

A list of cities

**Usage**

```
world_cities
```

**Format**

A data frame with 4,428 observations on the following 10 variables.

**geoname\_id** integer id of record in geonames database  
**name** name of geographical point in plain ascii characters  
**latitude** latitude in decimal degrees (wgs84)  
**longitude** longitude in decimal degrees (wgs84)  
**country** ISO-3166 2-letter country code  
**country\_region** fipscode  
**population** Population  
**timezone** the iana timezone id  
**modification\_date** date of last modification

**Source**

GeoNames: <https://download.geonames.org/export/dump/>

**Examples**

```
world_cities
```

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