Package: corona (via r-universe)

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Title Coronavirus ('Rona') Data Exploration

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Depends R (>= 3.5.0), plyr

Imports gganimate, ggplot2, gridExtra, qicharts2, reshape2

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Description Manipulate and view coronavirus data and other societally relevant data at a basic level.

License GPL-3

Encoding UTF-8

LazyData true

Roxygen list(markdown = TRUE)

RoxygenNote 7.1.0

Repository https://jvanschalkwyk.r-universe.dev

RemoteUrl https://github.com/jvanschalkwyk/corona

RemoteRef HEAD

RemoteSha 5d4621092cc8bb3772595ea5b50390cfcd564098

Contents

`allo` *Allometric scaling data.*

Description

Used to introduce power laws.

Usage

```
allo
```

Format

A data frame with 455 rows.

Species

Mass

Temperature

MR Metabolic rate

AvgMass

Q10SMR

Reference

Source

https://royalsocietypublishing.org/doi/suppl/10.1098/rsbl.2005.0378

`citymap` *Citymapper data.*

Description

These are a bit unusual in that each country has a column.

Usage

```
citymap
```

Format

A data frame with 108 rows.

Date

Australia

Austria

Belgium

Brazil

Canada

Denmark

France

Germany

Italy

Japan

Mexico

Netherlands

Portugal

Russia

Singapore

South.Korea

Spain

Sweden

Turkey

United.Kingdom

United.States

Source

https://citymapper.com/cmi/about

cntry *Country data from Our World In Data.*

Description

Country data from Our World In Data.

Usage

```
cntry
```

Format

A data frame with 17,013 rows (current)

iso_code ISO 3-letter country code

location Text name of country

population

continent

population_density

median_age

aged_65_older

aged_70_older

gdp_per_capita

extreme_poverty

cvd_death_rate

diabetes_prevalence

female_smokers

male_smokers

handwashing_facilities

hospital_beds_per_thousand

life_expectancy

alias Alias country name, shorter

lowstart Start of 'summer' viral respiratory low

lowend End of respiratory low. Sketchy at present.

Source

https://github.com/owid/covid-19-data/tree/master/public/data and https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4847850/

corona *Basic setup of corona (Nanny Rona) R program*

Description

Try ?corona for help. For most functions, saying pdf=TRUE will write a PDF to images/. If you wish to print to PDF, you need to setwd() to a directory that contains an images/ directory that can be written to, or this will fail. Individual examples are also available. Try e.g. ?corona_rabbits or ?corona_country The results of corona_life() will depend on how your system handles animated GIF files.

Usage

```
corona()
```

Examples

```
corona_rabbits ( )
corona_monty ( )
corona_country ('France')
corona_vienna ( )
corona_totals ( )
country_dead ( )
corona_converge ( )
corona_metabolism ( )
corona_citymap ( )
corona_dowjones ( )
```

corona_all *Generate all Figures*

Description

For the book 'Rona' (printing to PDF) work through and generate PDFs for all examples.

Usage

```
corona_all()
```

`corona_citymap` *Plot citymapper data against COVID-19 diagnoses, over time*

Description

Requires ggplot2, plyr and the data frames lock, owid, citymap. Multiple, select frames are plotted.

Usage

```
corona_citymap(pdf = FALSE, FewCities = NULL, cols = 4)
```

Arguments

`pdf`	= TRUE writes to PDF, default FALSE
`FewCities`	a c() list of city names from the city options. Default is all.
`cols`	Number of columns in output, default is 4

Examples

```
corona_citymap(cols=4);
```

`corona_converge` *Create various statistical distributions*

Description

Build a normal or log-normal distribution from simple components. Large numbers e.g. n=1e6 will take some time to run.

Usage

```
corona_converge(
  n = 1e+05,
  method = "add",
  runs = 7,
  pdf = FALSE,
  xscale = 1,
  bins = 64,
  log = FALSE
)
```

Arguments

n	is the number of samples
method	is either 'multiply' or 'add'
runs	number of iterations (default 7)
pdf	defaults to FALSE
xscale	a scaling factor, can use values < 1.0 to magnify (x) e.g. 0.4
bins	defaults to 64
log	take logarithm of values (for 'multiply')

Examples

```
corona_converge( n=10000, method='multiply', xscale=0.4, bins=128, runs=5 )
```

---

corona_country *Plot time course of coronavirus case incidence and deaths for one country*

Description

The daily case rate is also shown as a smoothed curve. The smoothed death incidence is MULTIPLIED x5 to highlight its relationship to the incidence curve. See grown-up documentation (LyX)

Usage

```
corona_country(country, pdf = FALSE, smooth = TRUE, deaths = TRUE)
```

Arguments

country	: no default
pdf	: defaults to FALSE. If TRUE, writes to country_name_new.pdf i.e. '*new.pdf' is appended to formal country name. If the country name contains spaces ' ' they are changed to underscores* ''
smooth	: default TRUE show smoothed (red) curve
deaths	: default TRUE show deaths

Examples

```
corona_country('United States');
corona_country('Taiwan');
```

corona_dowjones *Plot Dow-Jones Closing data*

Description

Assumes the existence of the data frame djia, part of corona data.

Usage

```
corona_dowjones(pdf = FALSE)
```

Arguments

pdf	: will not print to PDF

Examples

```
corona_dowjones ( )
```

corona_life *Animate Conway's Game of Life*

Description

The canvas (arena) wraps around vertically and horizontally! Execution will take some time. Results will be viewed differently depending on your system's default viewer for animated GIF files.

Usage

```
corona_life(
  pattern = "soup",
  side = 50,
  steps = 100,
  density = 0.3,
  filename = NULL,
  wrap = TRUE,
  fps = 20,
  pause = 10
)
```

Arguments

pattern	Defaults to 'soup' but there are many other well-known options: blinker ttetromino rpentomino toad beehive beacon clock pulsar pentadecathlon galaxy spaceship glidergun piheptomino switchengine conway acorn rabbits boring static patterns: block snake eater
side	The number of elements on the area's side (width or height)
steps	The number of frames
density	0.0–1 The density of the initial, random items ('soup')
filename	writes to this file name e.g. foo.gif (NULL for current GIF device)
wrap	Wrap around
fps	Frames per second
pause	Initial pause

Examples

```
## Not run:
corona_life( filename='animation.gif', side=50, steps=500, density=0.2 )
corona_life( side=100, steps=1000, pattern='rpentomino', wrap=FALSE )
corona_life( side=30, steps=120, pattern='spaceship' )
corona_life( side=100, steps=400, pattern='switchengine' )
corona_life( side=20, steps=30, pattern='clock' )
corona_life( side=20, steps=30, pattern='galaxy' )
corona_life( side=100, steps=200, pattern='glidergun' )
corona_life( side=45, steps=130, pattern='conway', fps=8, pause=40)

## End(Not run)
```

---

corona_lockdown *Draw multiple smoothed graphs of new daily cases, with lockdown date, if present*

Description

By default limited to countries with population > 4M, and over 200 cases. This may take over 5s to run, depending on your hardware.

Usage

```
corona_lockdown(
  pdf = FALSE,
  minpeople = 4e+06,
  mincases = 200,
  cols = 7,
  striptextsize = 10,
  textsize = 10,
  legendx = 0.94,
  legendy = 0.02
)
```

Arguments

pdf	print to PDF
minpeople	Minimum population for the country
mincases	Minimum number of COVID-19 cases
cols	Number of columns to display, default = 7
striptextsize	size of text in country names
textsize	Size of text header
legendx	X position of legend
legendy	Y position of legend

Examples

```
## Not run:
corona_lockdown( cols=14 )

## End(Not run)
```

---

corona_metabolism *Allometric scaling of metabolic rates*

Description

Log-log plot of mammalian weights (grams) against metabolic rates. The PDF file is allometry.pdf.

Usage

```
corona_metabolism(pdf = FALSE, base = 10)
```

Arguments

pdf	will not print to PDF
base	base for logarithms, default 10

Examples

```
corona_metabolism ( )
```

corona_monty *A Monte Carlo simulation of the Monty Hall problem*

Description

A Monte Carlo simulation of the Monty Hall problem

Usage

```
corona_monty(runs = 100)
```

Arguments

runs	specifies the number of parallel simulations, default=100.

Examples

```
corona_monty ( runs=10000 )
```

corona_rabbits *Demonstrate (graph) exponential growth of rabbit population:*

Description

For finer details, see the LyX/PDF documentation.

Usage

```
corona_rabbits(topyear = 6, pdf = FALSE)
```

Arguments

topyear	is last year, defaults to 6
pdf	Will not print to PDF if FALSE (the default)

Examples

```
corona_rabbits( topyear=10)
```

corona_totals *Plot total cases over time for a selected country.*

Description

Defaults to Italy, as this was our demonstration. Add a linear regression by specifying smooth=TRUE.

Usage

```
corona_totals(
  country = "Italy",
  daystart = 60,
  dayend = 76,
  pdf = FALSE,
  log = FALSE,
  smooth = FALSE,
  prefix = ""
)
```

Arguments

country	Text name of country (in owid frame)
daystart	first day
dayend	last day to plot
pdf	TRUE will print value
log	TRUE will take base 10 logarithm of y-axis values
smooth	TRUE will try to fit linear model (use with logarithm)
prefix	defaults to ”; a text value will be prefixed to PDF name *after* country_ name.

Examples

```
corona_totals( country='Italy', daystart=60, dayend=76, log=TRUE, smooth=TRUE )
corona_totals(country='United Kingdom', log=TRUE, smooth=TRUE)
```

corona_trends *Plot Google Trends data for searches involving the word 'coronavirus'.*

Description

Just plot the lines.

Usage

```
corona_trends(pdf = FALSE)
```

Arguments

pdf	default FALSE will *not* print the PDF file

Examples

```
corona_trends ( )
```

---

corona_vienna *Plot Semmelweis' original data from Vienna.*

Description

First simply 'plots the dots'; subsequently draws a run chart with a transition at the point where he instituted hand-washing.

Usage

```
corona_vienna(pdf = FALSE)
```

Arguments

pdf	default FALSE will *not* print the two PDF files: semmelweis_plot.pdf semmelweis_run.pdf

Examples

```
corona_vienna ( )
```

---

country_dead *Plot country deaths by week, with various adjustments:*

Description

Assumes the existence of the data frame stmf containing relevant iso_codes for countries. The unusual codes GBRTENW and GBR_SCO represent England+Wales and Scotland. You can obtain a list of countries by country_dead('?'), forcing a diagnostic error!

Usage

```
country_dead(country = "England+Wales", pdf = FALSE, save = FALSE)
```

Arguments

country	Country name
pdf	default FALSE will not print to PDF
save	Do we save the data as a CSV

Details

The columns in the frame stmf are just 'iso_code', 'Year', 'Week', and 'Deaths'.

Draws three graphs:

1. Raw data with a linear regression line, over n years;
2. Data with secular adjustment;
3. Data adjusted for a 'summer baseline' using the "other n years of data" after secular adjustment.

Examples

```
country_dead( 'New Zealand' )
```

`djia` *Historical Dow Jones Industrial Average prices.*

Description

Historical Dow Jones Industrial Average prices.

Usage

```
djia
```

Format

A data frame with 110 rows (current)

Date Date of transaction—excludes weekends etc

Open Opening average

High Maximum over the day

Low Minimum

Close Closing price

Source

https://www.wsj.com/market-data/quotes/index/DJIA/historical-prices

gt *Google trends search for 'coronavirus'.*

Description

Google trends search for 'coronavirus'.

Usage

```
gt
```

Format

A data frame with 155 rows (current)

Date Date in format YYYY-MM-DD

Day

coronavirus Coronavirus 'interest' as percentage of maximum count

Source

https://trends.google.com/trends/

life *The game of life.*

Description

This specifies initial conditions, using a clumsy storage format as below.

Usage

```
life
```

Format

A data frame with 213 rows.

x x co-ordinate of an active cell

y y co-ordinate

pattern A name like 'blinker' — will be common to several rows, specifying a Game of Life pattern

Source

(internal generation)

lock *Approximate dates of full lockdown in various countries.*

Description

Approximate dates of full lockdown in various countries.

Usage

```
lock
```

Format

A data frame with 110 rows (current)

iso_code Country

Lockdown Date of lockdown YYYY-MM-DD

nature Text description: national | partial | advice | empty(none)

Source

Various data sources.

owid *Wide-ranging data from Our World In Data. I only use a tiny part.*

Description

Wide-ranging data from Our World In Data. I only use a tiny part.

Usage

```
owid
```

Format

A data frame with 17,013 rows (current)

iso_code ISO 3-letter country code

date Date for this row of data

total_cases total cases to date

new_cases new cases

total_deaths eponymous

new_deaths

total_tests Recorded tests in toto

new_tests Eponymous

tests_units

stringency_index How severe the lockdown was

Source

https://github.com/owid/covid-19-data/tree/master/public/data

---

`stmf` *Deaths, by week, for various countries.*

Description

Deaths, by week, for various countries.

Usage

```
stmf
```

Format

A data frame with 22678 rows.

iso_code Normally a 3-character country code e.g. NZL, AUT. England+Wales=GBRTENW, Scotland=GBR_SCO

Year YYYY

Week Week within that year, 1=1st

Deaths Number of deaths in that week

X

Source

https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/weeklyprovisionalfiguresondeathsregisteredinenglandandwales https://www.stats.govt.nz/experimental/covid-19-data-portal https://www.scb.se/en/finding-statistics/statistics-by-subject-area/population/population-composition/population-statistics/#_Tablesandgraphs and also (registration now required) https://www.mortality.org/

`vienna` *Semmelweis' data on Deaths of parturients in Vienna*

Description

Semmelweis' data on Deaths of parturients in Vienna

Usage

```
vienna
```

Format

A data frame with 98 rows

date Date of the start of each month YYYY-MM-01

births Number of births during that month

deaths Number of maternal deaths during that month

Source

https://en.wikipedia.org/wiki/Historical_mortality_rates_of_puerperal_fever

Index