Package 'UScensus2010'

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Type Package

Title US Census 2010 Suite of R Packages

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Description US Census 2010 shape files and additional demographic data from the SF1 100 percent files. This package contains a number of helper functions for the UScensus2010blk, UScensus2010blkgrp, UScensus2010tract, UScensus2010cdp packages.

License GPL (>= 2)

Depends R (>= 2.10), maptools, sp, foreign, methods, grDevices, base, stats, utils

Suggests rgdal

LazyLoad yes

URL https://github.com/zalmquist/UScensus2010

NeedsCompilation no

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R topics documented:

`UScensus2010-package` *Helper functions for the UScensus2010-suite of packages*

Description

This package helps the user handle the spatial and demographic data available in `UScensus2010tract`, `UScensus2010cdp`, `UScensus2010county`, `UScensus2010blkgrp`, and `UScensus2010blk`

Details

Package:	UScensus2010
Type:	Package
Version:	0.2
Date:	2021-07-21
License:	GPL Version 2 or newer
LazyLoad:	yes

Note

If you use this package and/or software manual in your work, a citation would be appreciated. References to the current versions are:

Preferred Citation for the Package:

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2010 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Package Citation:

Zack W Almquist (2010). UScensus2010: US Census 2010 Suite of R Packages. R package version 1.00.

Please also cite the original data source and the sp and maptools.

Census 2010 Summary File 1 [name of state1 or United States]/prepared by the U.S. Census Bureau, 2010.

Bivand RS, Pebesma EJ, Gomez-Rubio V (2008). Applied Spatial Data Analysis with R. Springer, New York, NY.

Author(s)

Zack W Almquist<zalmquist@uw.edu>
Maintainer: Zack W Almquist <zalmquist@uw.edu>

`areaPoly` *Area of the polygons in SpatialPolygonsDataFrame*

Description

Calculates the area of each polygon in `SpatialPolygonsDataFrame`.

Usage

```
areaPoly(sp.object=NULL)
```

Arguments

`sp.object`	`SpatialPolygonsDataFrame`, must be a `SpatialPolygonsDataFrame` object.

Value

a numeric vector.

Author(s)

Zack W. Almquist

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Also see: SpatialPolygonsDataFrame

Examples

```
## Not run:
data(oregon.county10)



## Build density using areaPoly()
den00<-oregon.county10$P0010001/areaPoly(oregon.county10)
oregon.county10$den00<-den00

choropleth(oregon.county10,"den00",

color = list(fun = "rainbow",

attr = list(4)),

main="2010 US Counties \n Oregon",type="plot",border="transparent")

## End(Not run)
```

---

choropleth *Choropleth Mapping*

Description

A function geared to making choropleth maps easier to construct for the US Census Data.

Usage

```
choropleth(sp,

dem = "P0010001", cuts = list("quantile", seq(0, 1, 0.25)),

color = list(fun = "hsv",
```

```
attr = list(h = c(0.4, 0.5, 0.6, 0.7), s = 0.6, v = 0.6, alpha = 1)),

main = NULL, sub = "Quantiles (equal frequency)", border = "transparent",

legend = list(pos = "bottomleft", title = "Population Count"), type = "plot", ...)
```

Arguments

sp	SpatialPolygonsDataFrame, must be a SpatialPolygonsDataFrame object.
dem	a character string, this must be the name of one of the data.frame objects contained within the SpatialPolygonsDataFrame (e.g. "P0010001").
cuts	a list containing "quantile" and seq object from 0 to 1.
color	a list containing a function and list of arguments for the function to produce the requested color scheme.
main	a character string, this will be the title of the plot.
sub	a character string, this will be the subtitle on the plot.
border	a character string, this selects the border color of the polygons.
legend	a list containing first where to place the legend and second a title for the legend.
type	a character string, can be either "plot" or "spplot".
...	Only arguments available in plot.

Details

choropleth is simply a convenient front end for plot and spplot specifically for use in making quick choropleth maps of US Census data.

Value

a plot or lattice object.

Author(s)

Zack W Almquist

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

See Also

spplot, plot

Examples

```
## Not run:
data(oregon.county10)

###Using plot
choropleth(oregon.county10,"P0010001",
color = list(fun = "rainbow", attr = list(4)),
main="2010 Counties \n Oregon",type="plot",
border="transparent")



###Using spplot
choropleth(oregon.county10,"P0010001",
main="2010 Counties \n Oregon",
border="transparent",type="spplot")

## End(Not run)
```

`city` *Selects one or more CDP(s) from a given state*

Description

`city` allows the user to pull out the polygon and metadata of one or more CDPs for any given state by name.

Usage

```
city(name, state, statefips = FALSE, sp.object = NULL, proj = NULL )
```

Arguments

`name`	a character string, takes the value of a string or string vector and has to be the exact name or names of CDP(s). (If you are unsure of the exact name a quick way to find it is to load the `library(UScensus2010cdp)` and pull out the list of names for the state you are interested in (see example).Note: if statefips=TRUE then this must be a CDP fips code.
`state`	a character string, can either be the full name (e.g. "oregon"), the abbreviation (e.g. "or"), or the FIPS code (e.g. "41")– note that if you are using the FIPS code you have to change `statefips` to `TRUE`.
`statefips`	logical, by default `statefips=FALSE`, change to `TRUE` when providing `state` with a FIPS code.
`sp.object`	`SpatialPolygonsDataFrame`, default `NULL`, allows the user to provide an sp object in which to perform this operation; primarily for use with `demographics.add`.
`proj`	CRS-class, takes a CRS object (e.g. CRS("+proj=utm +zone=10 +datum=NAD83")); This is simply a wrapper for the `spTransform` function in `rgdal` . WARNING requires `rgdal` package.

Value

An object of class SpatialPolygonsDataFrame.

Author(s)

Zack W. Almquist <zalmquist@uw.edu>

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Census 2010 Summary File 1 [name of state1 or United States]/prepared by the U.S. Census Bureau, 2011.
https://www.census.gov/prod/cen2000/doc/sf1.pdf

Examples

```
## Not run:
##Load oregon.cdp10 data
data(oregon.cdp10)

##look at the list of oregon CDP names in alphabetic order
oregon.cdp10$name[order(oregon.cdp10$name)]

##grab the CDP of Portland, OR
portland<-city(name="portland",state="or")


##plot the polygon of Portland, OR
plot(portland)
title("Portland, OR")

## End(Not run)
```

---

county *Selects one or more counties in a given state*

Description

county allows the user to pull out the polygon and metadata of one or more county(s) from a given state.

Usage

```
county(fips = NULL, name = NULL, state, level =
c("tract", "blk", "blkgrp"), statefips = FALSE,
sp.object=NULL, proj=NULL)
```

Arguments

fips	a character string, takes a string of three characters (i.e. a county FIPS code (e.g. "001").
name	a character string, this must be the name of an actual county in the state (e.g. "Baker" county Oregon). This variable is insensitive to case.
state	a character string, can either be the full name (e.g. "oregon"), the abbreviation (e.g. "or"), or the FIPS code (e.g. "41")– note that if you are using the FIPS code you have to change statefips to TRUE. This variable is insensitive to case.
level	a character string, takes in one of three values: "tract", "blk", or "blkgrp". This defines the geographic level of data for the county.
statefips	logical, by default statefips=FALSE, change to TRUE when providing state with a FIPS code.
sp.object	SpatialPolygonsDataFrame, default NULL, allows the user to provide an sp object in which to perform this operation; primarily for use with demographics.add.
proj	CRS-class, takes a CRS object (e.g. CRS("+proj=utm +zone=10 +datum=NAD83")); This is simply a wrapper for the spTransform function in rgdal . WARNING requires rgdal package.

Value

An object of class SpatialPolygonsDataFrame.

Warning

You must have the packages UScensus2000blkgrp and UScensus2000blk installed to use levels "blkgrp" and "blk" respectively.

Author(s)

Zack W. Almquist <zalmquist@uw.edu>

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Census 2010 Summary File 1 [name of state1 or United States]/prepared by the U.S. Census Bureau, 2011.
https://www.census.gov/prod/cen2000/doc/sf1.pdf

Examples

```
## Not run:
#### look at the counties of Oregon
data(countyfips)
countyfips[countyfips$statename=="oregon",]

### The county fips code is the last three characters
county.f<-"001"
county.n<-c("deschutes","crook county")

## Pull out these counties
c1<-county(fips=county.f,state="or",level="tract")
c2<-county(name=county.n,state="or",level="tract")

##Plot counties
oregon.counties<-countyfips[countyfips$statename=="oregon",]
col<-cbind(c("red","blue"),c("013","017"))
plot(c2,col=col[match(c2$county,col[,2]),1],border="gray")
title("Deschutes and Crook counties, OR 2000")
coord<-coordinates(c2)
text(coord[c(1,4),],oregon.counties$countyname[oregon.counties$countyname%in%county.n],cex=2)

## End(Not run)
```

---

countyfips *County FIPS codes*

Description

County names and FIPS codes for use in county

Usage

```
data(countyfips)
```

Format

A data frame with 3143 observations on the following 4 variables.

`fips` a character vector

`countyname` a character vector

`statename` a character vector

`acronym` a character vector

Details

This file lists all counties and equivalent areas in the United States defined as of 2000. Built from https://www2.census.gov/programs-surveys/popest/technical-documentation/methodology/1990-2000/90s-fips.txt. This is primarily for use in county.

Source

https://www2.census.gov/programs-surveys/popest/technical-documentation/methodology/1990-2000/90s-fips.txt

Examples

```
data(countyfips)
```

---

demographics *Selects a specified demographic meta-data from the sp objects.*

Description

demographics allows the user to pull out one or more demographic variables at several different geographic levels.

Usage

```
demographics(dem = "P0010001", state, statefips=FALSE, level = c("tract",
    "blk", "blkgrp", "cdp", "msa", "county"), msaname=NULL)
```

Arguments

dem	Character string or vector. Must be the actual name of the demographic variables attached to UScensus2010 objects. Default dem = " P0010001"
state	a character string, can either be the full name of a state (e.g. "oregon"), the abbreviation (e.g. "or"), or the FIPS code (e.g. "41")– note that if you are using the FIPS code you have to change statefips to TRUE. This variable is insensitive to case.
statefips	logical, by default statefips=FALSE, set to TRUE if using the state FIPS codes.
level	a character string, takes levels tract, blk, blkgrp, cdp, msa or county
msaname	logical (optional), if level="msa", allows the use of the verbose MSA place-name (capitalized).

Value

An object of class matrix.

Warning

You must have the packages UScensus2010tract, UScensus2010blkgrp and UScensus2010blk installed to use levels "blkgrp" and "blk" respectively.

Author(s)

Zack W. Almquist <almquist@uci.edu>

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Census 2010 Summary File 1 [name of state1 or United States]/prepared by the U.S. Census Bureau, 20010.
https://www.census.gov/prod/cen2010/doc/sf1.pdf

See Also

county, MSA, city

Examples

```
## Not run:
#County Example
demographics(state="or",level="county")

## End(Not run)
```

`install.blk` *Installer for the UScensus2000blk package.*

Description

Convenient installer for the UScensus2000 package. Warning this installs from the source file for OS X and Linux and can take several minutes. Windows install only available for 2.11+ at this time.

Usage

```
install.blk(x)
```

Arguments

x	a character string, must be either "osx:, "linux" or "windows":

Warning

This is an extremely large file (around 2 gigs) and should only be installed if you have a very good connection. Also it is worth noting that for all systems the install is from source and can take quite a bit of time to install.

Author(s)

Zack W Almquist

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Examples

```
## Not run:
install.blk("osx")

## End(Not run)
```

`install.blkgrp` *Installer for the UScensus2010blkgrp package.*

Description

Convenient installer for the UScensus2010 package. Warning this installs from the source file for OS X and Linux and can take several minutes. Windows install only available for 2.11+ at this time.

Usage

```
install.blkgrp(x)
```

Arguments

x	a character string, must be either "osx:, "linux" or "windows"

Warning

This is an extremely large file (around 300 megabytes) and should only be installed if you have a very good connection. Also it is worth noting that for all systems the install is from source and can take quite a bit of time to install.

Author(s)

Zack W Almquist

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Examples

```
## Not run:
install.blkgrp("osx")

## End(Not run)
```

`install.cdp` *Installer for the UScensus2010cdp package.*

Description

Convenient installer for the UScensus2010 package. Warning this installs from the source file for OS X and Linux and can take several minutes. Windows install only available for 2.11+ at this time.

Usage

```
install.cdp(x)
```

Arguments

x	a character string, must be either "osx:, "linux" or "windows"

Warning

This is an extremely large file (around 180 megabytes) and should only be installed if you have a very good connection. Also it is worth noting that for all systems the install is from source and can take quite a bit of time to install.

Author(s)

Zack W Almquist

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Examples

```
## Not run:
install.cdp("osx")

## End(Not run)
```

`install.county` *Installer for the UScensus2010county package.*

Description

Convenient installer for the UScensus2010 package. Warning this installs from the source file for OS X and Linux and can take several minutes. Windows install only available for 2.11+ at this time.

Usage

```
install.county(x)
```

Arguments

x	a character string, must be either "osx:, "linux" or "windows"

Warning

This is an extremely large file (around 180 megabytes) and should only be installed if you have a very good connection. Also it is worth noting that for all systems the install is from source and can take quite a bit of time to install.

Author(s)

Zack W Almquist

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Examples

```
## Not run:
install.county("osx")

## End(Not run)
```

`install.tract` *Installer for the UScensus2010tract package.*

Description

Convenient installer for the UScensus2010 package. Warning this installs from the source file for OS X and Linux and can take several minutes. Windows install only available for 2.11+ at this time.

Usage

```
install.tract(x)
```

Arguments

x	a character string, must be either "osx:, "linux" or "windows"

Warning

This is an extremely large file (around 180 megabytes) and should only be installed if you have a very good connection. Also it is worth noting that for all systems the install is from source and can take quite a bit of time to install.

Author(s)

Zack W Almquist

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Examples

```
## Not run:
install.tract("osx")

## End(Not run)
```

MSA *Selects one MSA from a given state.*

Description

MSA allows the user to pull out the polygon and metadata of one MSA from any given state for any of three levels: tract, blockgroup, or block.

Usage

```
MSA(msafips = NULL, msaname = NULL, state=NULL , statefips=FALSE,
level = c("tract", "blk", "blkgrp"), proj = NULL)
```

Arguments

msafips	a character string, takes a four digit MSA FIPS code (e.g. "0040" of Texas)
msaname	a character string, this can either be in conjunction with the variable state or not. Case 1: Full MSA name (state should be left NULL in this case) (e.g. "Abilene, TX MSA"); this must be exact. Case 2: takes one of the city names of the MSA and the one of the states which contain the MSA (e.g. msaname="Albany" and state= "NY").
state	a character string, this takes in a state abbreviation in capitals in conjunction with msaname, see above for more details.
statefips	logical, by default statefips=FALSE, change to TRUE when providing state with a FIPS code.
level	a character string, takes in one of three values: "tract", "blk", or "blkgrp". This defines the geographic level of data for the MSA.
proj	CRS-class, takes a CRS object (e.g. CRS("+proj=utm +zone=10 +datum=NAD83")); This is simply a wrapper for the spTransform function in rgdal . WARNING requires rgdal package.

Value

An object of class SpatialPolygonsDataFrame.

Warning

You must have the packages UScensus2000blkgrp and UScensus2000blk installed to use levels "blkgrp" and "blk" respectively.

Author(s)

Zack W. Almquist <zalmquist@uw.edu>

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Census 2000 Summary File 1 [name of state1 or United States]/prepared by the U.S. Census Bureau, 2001.
https://www.census.gov/prod/cen2000/doc/sf1.pdf

See Also

county

Examples

```
## Not run:
## Load the data files for MSA names and MSA FIPS codes
data(MSAnames)
data(MSAfips)

## Save the FIPS code for Abilene, TX MSA
ab.fips<-MSAfips$msa.cmsa.fips[1]

###Use the MSA FIPS code
Abilene<-MSA(msafips=ab.fips,level="tract")

###USe the MSA full name
Abilene<-MSA(msaname="Abilene, TX MSA",level="tract")

##Use the msaname alternative
portland<-MSA(msaname="Portland",state="OR",level="tract")


##Plot Portland
plot(portland)
title("Portland MSA, OR 2000")

## End(Not run)
```

MSAfips *MSA FIPS codes*

Description

MSA FIPS codes for use in MSA

Usage

```
data(MSAfips)
```

Format

A data frame with 1516 observations on the following 7 variables.

`msa.cmsa.fips` a character vector

`pmsa.fips` a character vector

`fips.state` a character vector

`fips.county` a character vector

`central.outlying` a character vector

`place` a character vector

`name` a character vector

Details

Metropolitan areas and components, 1999. Built from https://www2.census.gov/programs-surveys/metro-micro/geographies/reference-files/1999/historical-delineation-files/99mfips.txt. This is primarily for use in MSA.

Source

https://www2.census.gov/programs-surveys/metro-micro/geographies/reference-files/1999/historical-delineation-files/99mfips.txt

Examples

```
data(MSAfips)
```

MSAnames *MSA Names and FIPS codes*

Description

MSA names and FIPS codes for use in MSA

Usage

```
data(MSAnames)
```

Format

A data frame with 356 observations on the following 3 variables.

`msa.cmsa.fips` a character vector

`pmsa.fips` a character vector

`name` a character vector

Details

Metropolitan areas and components, 1999. Built from https://www2.census.gov/programs-surveys/metro-micro/geographies/reference-files/1999/historical-delineation-files/99mfips.txt. This is primarily for use in MSA.

Source

https://www2.census.gov/programs-surveys/metro-micro/geographies/reference-files/1999/historical-delineation-files/99mfips.txt

Examples

```
data(MSAnames)
```

---

nameTofips *County or MSA name to FIPS code(s).*

Description

Takes the name of a county or msa and returns the associated fip(s) codes.

Usage

```
nameTofips(name, state, type = c("county", "msa"), statefips = FALSE)
```

Arguments

`name`	a character string, should be either a name of a county or msa.
`state`	a character string, can either be the full name (e.g. "oregon"), the abbreviation (e.g. "or"), or the FIPS code (e.g. "41")– note that if you are using the FIPS code you have to change `statefips` to `TRUE`.
`type`	a character string, should be either "county" or "msa"
`statefips`	logical, by default `statefips=FALSE`, change to `TRUE` when providing `state` with a FIPS code.

Value

Returns a character string.

Author(s)

Zack W. Almquist <zalmquist@uw.edu>

References

Zack W. Almquist (2010). US Census Spatial and Demographic Data in R: The UScensus2000 Suite of Packages. Journal of Statistical Software, 37(6), 1-31. https://www.jstatsoft.org/v37/i06/.

Census 2010 Summary File 1 [name of state1 or United States]/prepared by the U.S. Census Bureau, 2011.
https://www.census.gov/prod/cen2000/doc/sf1.pdf

Examples

```
## Not run:
## SF MSA FIPS Code
nameTofips("san francisco","ca","msa")

## Orange County FIPS
nameTofips("orange","ca","county")

## End(Not run)
```

---

states.names *States Names*

Description

A list of all the states available in UScensus2010

Usage

```
data(states.names)
```

Format

The format is: chr [1:49] "alabama" "arizona" "arkansas" "california" "colorado" ...

Details

For use in the functions of UScensus2010.

Examples

```
data(states.names)
```

`states.names.cap` *States Names Capitalized*

Description

A list of all the states available in `UScensus2010`

Usage

```
data(states.names.cap)
```

Format

The format is: chr [1:49] "Alabama" "Arizona" "Arkansas" "California" "Colorado" ...

Details

For use in the functions of `UScensus2010`.

Examples

```
data(states.names.cap)
```

Index