Package 'eechidna'

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Version 1.4.0

Title Exploring Election and Census Highly Informative Data Nationally for Australia

Description Data from the seven Australian Federal Elections (House of Representatives) between 2001 and 2019, and from the four Australian Censuses over the same period. Includes tools for visualizing and analysing the data, as well as imputing Census data for years in which a Census does not occur. This package incorporates data that is copyright Commonwealth of Australia (Australian Electoral Commission and Australian Bureau of Statistics) 2019.

Depends R (>= 3.5.0)

Imports dplyr, shiny, ggplot2, ggthemes, magrittr, rgeos, plotly (>= 4.5.6), sp, tidyr, graphics, stats, purrr, colourpicker, rgdal, methods, stringi, tibble, tidyselect

Suggests testthat, knitr, rmarkdown, maptools, purrrlyr, GGally, corrplot, broom, scales, readr, gridExtra, tidyverse, spelling

Encoding UTF-8

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LazyData true

ByteCompile TRUE

License GPL (>= 2)

URL https://github.com/ropenscilabs/eechidna

VignetteBuilder knitr

RoxygenNote 6.1.1

BugReports https://github.com/ropenscilabs/eechidna/issues

Language en-US

NeedsCompilation no

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`eechidna-package` *Exploring Election and Census Highly Informative Data Nationally for Australia*

Description

Data from 2013 Australian Federal Election and 2011 Australian Census for each House of Representatives electorate, along with some tools for visualizing and analysing the data.

Author(s)

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`abs2001` *2001 Australian Census data on all 150 electorates*

Description

A dataset containing demographic and other information about each electorate from the Australian Census of Population and Housing. The data were obtained from the Australian Bureau of Statistics, and downloaded from https://www.censusdata.abs.gov.au/datapacks/. Electorate boundaries match those in place at the time of the 2001 Federal election.

Usage

```
abs2001
```

Format

A data frame with 150 rows with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Name of electorate
- State: State containing electorate
- Population: Total population of electorate
- Area: Area of electorate division in square kilometres
- Age00_04: Percentage of people aged 0-4.
- Age05_14: Percentage of people aged 5-9.
- Age15_19: Percentage of people aged 15-19.
- Age20_24: Percentage of people aged 20-24.
- Age25_34: Percentage of people aged 25-34.
- Age35_44: Percentage of people aged 35-44.
- Age45_54: Percentage of people aged 45-54.
- Age55_64: Percentage of people aged 55-64.
- Age65_74: Percentage of people aged 65-74.
- Age75_84: Percentage of people aged 75-84.
- Age85plus: Percentage of people aged 85 or higher.
- Anglican: Percentage of people affiliated with the Anglican denomination
- AusCitizen: Percentage of people who are Australian Citizens
- AverageHouseholdSize: Average number of people in a household

- BachelorAbv: Percentage of people who have completed a Bachelor degree or above
- Born_Asia: Percentage of people born in Asia
- Born_MidEast: Percentage of people born in the Middle East
- Born_SE_Europe: Percentage of people born in South Eastern Europe
- Born_UK: Percentage of people born in the United Kingdom
- BornElsewhere: Percentage of people who were born overseas, outside of Asia, Middle East, South Eastern Europe and the UK
- BornOverseas_NS: Percentage of people who did not answer the question relating to birthplace
- Buddhism: Percentage of people affiliated with the Buddhist religion
- Catholic: Percentage of people affiliated with the Catholic denomimation
- Christianity: Percentage of people affiliated with the Christian religion (of all denominations)
- Couple_NoChild_House: Percentage of households made up of a couple with no children
- Couple_WChild_House: Percentage of households made up of a couple with children
- CurrentlyStudying: Percentage of people who are currently studying
- DeFacto: Percentage of people who are in a de facto marriage
- DiffAddress: Percentage of people who live at a different address to what they did 5 years ago
- DipCert: Percentage of people who have completed a diploma or certificate
- Distributive: Percentage of employed persons who work in wholesale trade, retail trade, transport, post or warehousing related industries
- EmuneratedElsewhere: Percentage of people who receive emuneration outside of Australia, out of the total population plus overseas visitors
- EnglishOnly: Percentage of people who speak only English
- Extractive: Percentage of employed persons who work in extractive industries (includes mining, gas, water, agriculture, waste, electricity)
- FamilyIncome_NS: Percentage of people who did not answer the question relating to family income
- FamilyRatio: Average number of people per family
- Finance: Percentage of employed persons who work in finance or insurance related industries
- HighSchool: Percentage of people who have completed high school
- HighSchool_NS: Rate of nonresponse for questions relating to high school completion
- HouseholdIncome_NS: Percentage of people who did not answer the question relating to household income
- Indigenous: Percentage of people who are Indigenous
- InternetAccess: Percentage of people with access to the internet
- InternetAccess_NS: Rate of nonresponse for questions relating to internal access
- InternetUse: Percentage of people who used internet in the last week (2001 only)
- InternetUse_NS: Rate of nonresponse for questions relating to internet use (2001 only)
- Islam: Percentage of people affiliated with the Islamic religion

- Judaism: Percentage of people affiliated with the Jewish religion
- Laborer: Percentage of employed persons who work as a laborer
- Language_NS: Rate of nonresponse for questions relating to language spoken at home
- LFParticipation: Labor force participation rate
- ManagerAdminClericalSales: Percentage of employed persons who work in management, administration, clerical duties and sales
- Married: Percentage of people who are married
- MedianAge: Median age
- MedianFamilyIncome: Median weekly family income (in $)
- MedianHouseholdIncome: Median weekly household income (in $)
- MedianLoanPay: Median mortgage loan repayment amount (of mortgage payments, in $)
- MedianPersonalIncome: Median weekly personal income (in $)
- MedianRent: Median weekly rental payment amount (of those who rent, in $)
- Mortgage: Percentage of dwellings that are on a mortgage
- NoReligion: Percentage of people with no religion
- OneParent_House: Percentage of households made up of one parent with children
- Other_NonChrist: Percentage of people affiliated with a religion other than Christianity, Buddhism, Islam and Judaism
- OtherChrist: Percentage of people affiliated with a denomination of the Christian religion other than Anglican or Catholic
- OtherLanguageHome: Percentage of people who speak a language other than English at home
- Owned: Percentage of dwellings that are owned outright
- PersonalIncome_NS: Rate of nonresponse for questions relating to personal income
- Professional: Percentage of employed persons who work as a professional
- PublicHousing: Percentage of dwellings that are owned by the government, and rented out to tenants
- Religion_NS: Rate of nonresponse for questions relating to religion
- Rent_NS: Rate of nonresponse for questions relating to rental costs
- Renting: Percentage of dwellings that are being rented
- SocialServ: Percentage of employed persons who work in education and training, healthcare, social work, community, arts and recreation
- SP_House: Percentage of households occupied by a single person
- Tenure_NS: Rate of nonresponse for questions relating to tenure
- Tradesperson: Percentage of employed persons who specialise in a trade
- Transformative: Percentage of employed persons who work in construction or manufacturing related industries
- Unemployed: Unemployment rate
- University_NS: Rate of nonresponse for questions relating to University
- Volunteer: Percentage of people who work as a volunteer
- Volunteer_NS: Rate of nonresponse for questions relating to working as a volunteer

Examples

```
library(eechidna)
library(dplyr)
data(abs2001)
abs2001 %>% select(DivisionNm, MedianAge, Unemployed, NoReligion, MedianPersonalIncome) %>% head()

# Join with two-party preferred voting data
library(ggplot2)
data(tpp01)
election2001 <- left_join(abs2001, tpp01, by = "UniqueID")
# See relationship between personal income and Liberal/National support
ggplot(election2001, aes(x = MedianPersonalIncome, y = LNP_Percent)) + geom_point() + geom_smooth()
```

---

abs2004 *Imputed Australian Census data for the electorates in place at time of the 2004 Federal election*

Description

A dataset containing estimated demographic and other information about each electorate. The data is imputed using Census information from 2001 and 2006. See the imputing-census-data vignette for more details.

Usage

```
abs2004
```

Format

A data frame with 150 rows with the following variables:

- Population: Number of people in electorate
- DivisionNm: Name of electorate
- Age00_04: Percentage of people aged 0-4.
- Age05_14: Percentage of people aged 5-9.
- Age15_19: Percentage of people aged 15-19.
- Age20_24: Percentage of people aged 20-24.
- Age25_34: Percentage of people aged 25-34.
- Age35_44: Percentage of people aged 35-44.
- Age45_54: Percentage of people aged 45-54.
- Age55_64: Percentage of people aged 55-64.
- Age65_74: Percentage of people aged 65-74.
- Age75_84: Percentage of people aged 75-84.
- Age85plus: Percentage of people aged 85 or higher.

- Anglican: Percentage of people affiliated with the Anglican denomimation
- AusCitizen: Percentage of people who are Australian Citizens
- AverageHouseholdSize: Average number of people in a household
- BachelorAbv: Percentage of people who have completed a Bachelor degree or above
- Born_Asia: Percentage of people born in Asia
- Born_MidEast: Percentage of people born in the Middle East
- Born_SE_Europe: Percentage of people born in South Eastern Europe
- Born_UK: Percentage of people born in the United Kingdom
- BornElsewhere: Percentage of people who were born overseas, outside of Asia, Middle East, South Eastern Europe and the UK
- Buddhism: Percentage of people affiliated with the Buddhist religion
- Catholic: Percentage of people affiliated with the Catholic denomimation
- Christianity: Percentage of people affiliated with the Christian religion (of all denominations)
- Couple_NoChild_House: Percentage of households made up of a couple with no children
- Couple_WChild_House: Percentage of households made up of a couple with children
- CurrentlyStudying: Percentage of people who are currently studying
- DeFacto: Percentage of people who are in a de facto marriage
- DiffAddress: Percentage of people who live at a different address to what they did 5 years ago
- DipCert: Percentage of people who have completed a diploma or certificate
- Distributive: Percentage of employed persons who work in wholesale trade, retail trade, transport, post or warehousing related industries
- EmuneratedElsewhere: Percentage of people who receive emuneration outside of Australia, out of the total population plus overseas visitors
- EnglishOnly: Percentage of people who speak only English
- Extractive: Percentage of employed persons who work in extractive industries (includes mining, gas, water, agriculture, waste, electricity)
- FamilyRatio: Average number of people per family
- Finance: Percentage of employed persons who work in finance or insurance related industries
- HighSchool: Percentage of people who have completed high school
- Indigenous: Percentage of people who are Indigenous
- InternetAccess: Percentage of people with access to the internet
- InternetUse: Percentage of people who used internet in the last week (2001 only)
- Islam: Percentage of people affiliated with the Islamic religion
- Judaism: Percentage of people affiliated with the Jewish religion
- Laborer: Percentage of employed persons who work as a laborer
- LFParticipation: Labor force participation rate
- ManagerAdminClericalSales: Percentage of employed persons who work in management, administration, clerical duties and sales

- Married: Percentage of people who are married
- MedianAge: Median age
- MedianFamilyIncome: Median weekly family income (in $)
- MedianHouseholdIncome: Median weekly household income (in $)
- MedianLoanPay: Median mortgage loan repayment amount (of mortgage payments, in $)
- MedianPersonalIncome: Median weekly personal income (in $)
- MedianRent: Median weekly rental payment amount (of those who rent, in $)
- Mortgage: Percentage of dwellings that are on a mortgage
- NoReligion: Percentage of people with no religion
- OneParent_House: Percentage of households made up of one parent with children
- Other_NonChrist: Percentage of people affiliated with a religion other than Christianity, Buddhism, Islam and Judaism
- OtherChrist: Percentage of people affiliated with a denomination of the Christian religion other than Anglican or Catholic
- OtherLanguageHome: Percentage of people who speak a language other than English at home
- Owned: Percentage of dwellings that are owned outright
- Professional: Percentage of employed persons who work as a professional
- PublicHousing: Percentage of dwellings that are owned by the government, and rented out to tenants
- Renting: Percentage of dwellings that are being rented
- SocialServ: Percentage of employed persons who work in education and training, healthcare, social work, community, arts and recreation
- SP_House: Percentage of households occupied by a single person
- Tradesperson: Percentage of employed persons who specialise in a trade
- Transformative: Percentage of employed persons who work in construction or manufacturing related industries
- Unemployed: Unemployment rate
- Volunteer: Percentage of people who work as a volunteer
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.

Details

Note that this data was updated in October 2019. The older versions can be found at ‘https://github.com/ropenscilabs/eechidna data‘

Examples

```
library(eechidna)
library(dplyr)
data(abs2004)
abs2004 %>% select(DivisionNm, MedianAge, Unemployed, NoReligion, MedianPersonalIncome) %>% head()

# Join with two-party preferred voting data
library(ggplot2)
data(tpp04)
election2004 <- left_join(abs2004, tpp04, by = "UniqueID")
# See relationship between personal income and Liberal/National support
ggplot(election2004, aes(x = MedianPersonalIncome, y = LNP_Percent)) + geom_point() + geom_smooth()
```

---

abs2006 *2006 Australian Census data on all 150 electorates (2004 boundaries)*

Description

A dataset containing demographic and other information about each electorate from the Australian Census of Population and Housing. The data were obtained from the Australian Bureau of Statistics, and downloaded from https://www.censusdata.abs.gov.au/datapacks/. Electorate boundaries match those in place at the time of the 2004 Federal election.

Usage

```
abs2006
```

Format

A data frame with 150 rows with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Name of electorate
- State: State containing electorate
- Population: Total population of electorate
- Area: Area of electorate division in square kilometres
- Age00_04: Percentage of people aged 0-4.
- Age05_14: Percentage of people aged 5-9.
- Age15_19: Percentage of people aged 15-19.
- Age20_24: Percentage of people aged 20-24.
- Age25_34: Percentage of people aged 25-34.
- Age35_44: Percentage of people aged 35-44.
- Age45_54: Percentage of people aged 45-54.

- Age55_64: Percentage of people aged 55-64.
- Age65_74: Percentage of people aged 65-74.
- Age75_84: Percentage of people aged 75-84.
- Age85plus: Percentage of people aged 85 or higher.
- Anglican: Percentage of people affiliated with the Anglican denomination
- AusCitizen: Percentage of people who are Australian Citizens
- AverageHouseholdSize: Average number of people in a household
- BachelorAbv: Percentage of people who have completed a Bachelor degree or above
- Born_Asia: Percentage of people born in Asia
- Born_MidEast: Percentage of people born in the Middle East
- Born_SE_Europe: Percentage of people born in South Eastern Europe
- Born_UK: Percentage of people born in the United Kingdom
- BornElsewhere: Percentage of people who were born overseas, outside of Asia, Middle East, South Eastern Europe and the UK
- BornOverseas_NS: Percentage of people who did not answer the question relating to birthplace
- Buddhism: Percentage of people affiliated with the Buddhist religion
- Catholic: Percentage of people affiliated with the Catholic denomination
- Christianity: Percentage of people affiliated with the Christian religion (of all denominations)
- Couple_NoChild_House: Percentage of households made up of a couple with no children
- Couple_WChild_House: Percentage of households made up of a couple with children
- CurrentlyStudying: Percentage of people who are currently studying
- DeFacto: Percentage of people who are in a de facto marriage
- DiffAddress: Percentage of people who live at a different address to what they did 5 years ago
- DipCert: Percentage of people who have completed a diploma or certificate
- Distributive: Percentage of employed persons who work in wholesale trade, retail trade, transport, post or warehousing related industries
- EmuneratedElsewhere: Percentage of people who receive emuneration outside of Australia, out of the total population plus overseas visitors
- EnglishOnly: Percentage of people who speak only English
- Extractive: Percentage of employed persons who work in extractive industries (includes mining, gas, water, agriculture, waste, electricity)
- FamilyIncome_NS: Percentage of people who did not answer the question relating to family income
- FamilyRatio: Average number of people per family
- Finance: Percentage of employed persons who work in finance or insurance related industries
- HighSchool: Percentage of people who have completed high school
- HighSchool_NS: Rate of nonresponse for questions relating to high school completion

- HouseholdIncome_NS: Percentage of people who did not answer the question relating to household income
- Indigenous: Percentage of people who are Indigenous
- InternetAccess: Percentage of people with access to the internet
- InternetAccess_NS: Rate of nonresponse for questions relating to internal access
- InternetUse: Percentage of people who used internet in the last week (2001 only)
- InternetUse_NS: Rate of nonresponse for questions relating to internet use (2001 only)
- Islam: Percentage of people affiliated with the Islamic religion
- Judaism: Percentage of people affiliated with the Jewish religion
- Laborer: Percentage of employed persons who work as a laborer
- Language_NS: Rate of nonresponse for questions relating to language spoken at home
- LFParticipation: Labor force participation rate
- ManagerAdminClericalSales: Percentage of employed persons who work in management, administration, clerical duties and sales
- Married: Percentage of people who are married
- MedianAge: Median age
- MedianFamilyIncome: Median weekly family income (in $)
- MedianHouseholdIncome: Median weekly household income (in $)
- MedianLoanPay: Median mortgage loan repayment amount (of mortgage payments, in $)
- MedianPersonalIncome: Median weekly personal income (in $)
- MedianRent: Median weekly rental payment amount (of those who rent, in $)
- Mortgage: Percentage of dwellings that are on a mortgage
- NoReligion: Percentage of people with no religion
- OneParent_House: Percentage of households made up of one parent with children
- Other_NonChrist: Percentage of people affiliated with a religion other than Christianity, Buddhism, Islam and Judaism
- OtherChrist: Percentage of people affiliated with a denomination of the Christian religion other than Anglican or Catholic
- OtherLanguageHome: Percentage of people who speak a language other than English at home
- Owned: Percentage of dwellings that are owned outright
- PersonalIncome_NS: Rate of nonresponse for questions relating to personal income
- Professional: Percentage of employed persons who work as a professional
- PublicHousing: Percentage of dwellings that are owned by the government, and rented out to tenants
- Religion_NS: Rate of nonresponse for questions relating to religion
- Rent_NS: Rate of nonresponse for questions relating to rental costs
- Renting: Percentage of dwellings that are being rented
- SocialServ: Percentage of employed persons who work in education and training, healthcare, social work, community, arts and recreation

- SP_House: Percentage of households occupied by a single person
- Tenure_NS: Rate of nonresponse for questions relating to tenure
- Tradesperson: Percentage of employed persons who specialise in a trade
- Transformative: Percentage of employed persons who work in construction or manufacturing related industries
- Unemployed: Unemployment rate
- University_NS: Rate of nonresponse for questions relating to University
- Volunteer: Percentage of people who work as a volunteer
- Volunteer_NS: Rate of nonresponse for questions relating to working as a volunteer

Examples

```
library(eechidna)
library(dplyr)
data(abs2006)
abs2006 %>% select(DivisionNm, MedianAge, Unemployed, NoReligion, MedianPersonalIncome) %>% head()
```

`abs2007` *Imputed Australian Census data for the electorates in place at time of the 2007 Federal election*

Description

A dataset containing estimated demographic and other information about each electorate. The data is imputed using Census information from 2006 and 2011. See the imputing-census-data vignette for more details.

Usage

```
abs2007
```

Format

A data frame with 150 rows with the following variables:

- Population: Number of people in electorate
- DivisionNm: Name of electorate
- Age00_04: Percentage of people aged 0-4.
- Age05_14: Percentage of people aged 5-9.
- Age15_19: Percentage of people aged 15-19.
- Age20_24: Percentage of people aged 20-24.
- Age25_34: Percentage of people aged 25-34.
- Age35_44: Percentage of people aged 35-44.

- Age45_54: Percentage of people aged 45-54.
- Age55_64: Percentage of people aged 55-64.
- Age65_74: Percentage of people aged 65-74.
- Age75_84: Percentage of people aged 75-84.
- Age85plus: Percentage of people aged 85 or higher.
- Anglican: Percentage of people affiliated with the Anglican denomination
- AusCitizen: Percentage of people who are Australian Citizens
- AverageHouseholdSize: Average number of people in a household
- BachelorAbv: Percentage of people who have completed a Bachelor degree or above
- Born_Asia: Percentage of people born in Asia
- Born_MidEast: Percentage of people born in the Middle East
- Born_SE_Europe: Percentage of people born in South Eastern Europe
- Born_UK: Percentage of people born in the United Kingdom
- BornElsewhere: Percentage of people who were born overseas, outside of Asia, Middle East, South Eastern Europe and the UK
- Buddhism: Percentage of people affiliated with the Buddhist religion
- Catholic: Percentage of people affiliated with the Catholic denomination
- Christianity: Percentage of people affiliated with the Christian religion (of all denominations)
- Couple_NoChild_House: Percentage of households made up of a couple with no children
- Couple_WChild_House: Percentage of households made up of a couple with children
- CurrentlyStudying: Percentage of people who are currently studying
- DeFacto: Percentage of people who are in a de facto marriage
- DiffAddress: Percentage of people who live at a different address to what they did 5 years ago
- DipCert: Percentage of people who have completed a diploma or certificate
- Distributive: Percentage of employed persons who work in wholesale trade, retail trade, transport, post or warehousing related industries
- EmuneratedElsewhere: Percentage of people who receive emuneration outside of Australia, out of the total population plus overseas visitors
- EnglishOnly: Percentage of people who speak only English
- Extractive: Percentage of employed persons who work in extractive industries (includes mining, gas, water, agriculture, waste, electricity)
- FamilyRatio: Average number of people per family
- Finance: Percentage of employed persons who work in finance or insurance related industries
- HighSchool: Percentage of people who have completed high school
- Indigenous: Percentage of people who are Indigenous
- InternetAccess: Percentage of people with access to the internet
- InternetUse: Percentage of people who used internet in the last week (2001 only)
- Islam: Percentage of people affiliated with the Islamic religion

- Judaism: Percentage of people affiliated with the Jewish religion
- Laborer: Percentage of employed persons who work as a laborer
- LFParticipation: Labor force participation rate
- ManagerAdminClericalSales: Percentage of employed persons who work in management, administration, clerical duties and sales
- Married: Percentage of people who are married
- MedianAge: Median age
- MedianFamilyIncome: Median weekly family income (in $)
- MedianHouseholdIncome: Median weekly household income (in $)
- MedianLoanPay: Median mortgage loan repayment amount (of mortgage payments, in $)
- MedianPersonalIncome: Median weekly personal income (in $)
- MedianRent: Median weekly rental payment amount (of those who rent, in $)
- Mortgage: Percentage of dwellings that are on a mortgage
- NoReligion: Percentage of people with no religion
- OneParent_House: Percentage of households made up of one parent with children
- Other_NonChrist: Percentage of people affiliated with a religion other than Christianity, Buddhism, Islam and Judaism
- OtherChrist: Percentage of people affiliated with a denomination of the Christian religion other than Anglican or Catholic
- OtherLanguageHome: Percentage of people who speak a language other than English at home
- Owned: Percentage of dwellings that are owned outright
- Professional: Percentage of employed persons who work as a professional
- PublicHousing: Percentage of dwellings that are owned by the government, and rented out to tenants
- Renting: Percentage of dwellings that are being rented
- SocialServ: Percentage of employed persons who work in education and training, healthcare, social work, community, arts and recreation
- SP_House: Percentage of households occupied by a single person
- Tradesperson: Percentage of employed persons who specialise in a trade
- Transformative: Percentage of employed persons who work in construction or manufacturing related industries
- Unemployed: Unemployment rate
- Volunteer: Percentage of people who work as a volunteer
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.

Details

Note that this data was updated in October 2019. The older versions can be found at ‘https://github.com/ropenscilabs/eechidna data‘

Examples

```
library(eechidna)
library(dplyr)
data(abs2007)
abs2007 %>% select(DivisionNm, MedianAge, Unemployed, NoReligion, MedianPersonalIncome) %>% head()

# Join with two-party preferred voting data
library(ggplot2)
data(tpp07)
election2007 <- left_join(abs2007, tpp07, by = "UniqueID")
# See relationship between personal income and Liberal/National support
ggplot(election2007, aes(x = MedianPersonalIncome, y = LNP_Percent)) + geom_point() + geom_smooth()
```

---

abs2010 *Imputed Australian Census data for the electorates in place at time of the 2010 Federal election*

Description

A dataset containing estimated demographic and other information about each electorate. The data is imputed using Census information from 2006 and 2011. See the imputing-census-data vignette for more details.

Usage

```
abs2010
```

Format

A data frame with 150 rows with the following variables:

- Population: Number of people in electorate
- DivisionNm: Name of electorate
- Age00_04: Percentage of people aged 0-4.
- Age05_14: Percentage of people aged 5-9.
- Age15_19: Percentage of people aged 15-19.
- Age20_24: Percentage of people aged 20-24.
- Age25_34: Percentage of people aged 25-34.
- Age35_44: Percentage of people aged 35-44.
- Age45_54: Percentage of people aged 45-54.
- Age55_64: Percentage of people aged 55-64.
- Age65_74: Percentage of people aged 65-74.
- Age75_84: Percentage of people aged 75-84.
- Age85plus: Percentage of people aged 85 or higher.

- Anglican: Percentage of people affiliated with the Anglican denomimation
- AusCitizen: Percentage of people who are Australian Citizens
- AverageHouseholdSize: Average number of people in a household
- BachelorAbv: Percentage of people who have completed a Bachelor degree or above
- Born_Asia: Percentage of people born in Asia
- Born_MidEast: Percentage of people born in the Middle East
- Born_SE_Europe: Percentage of people born in South Eastern Europe
- Born_UK: Percentage of people born in the United Kingdom
- BornElsewhere: Percentage of people who were born overseas, outside of Asia, Middle East, South Eastern Europe and the UK
- Buddhism: Percentage of people affiliated with the Buddhist religion
- Catholic: Percentage of people affiliated with the Catholic denomimation
- Christianity: Percentage of people affiliated with the Christian religion (of all denominations)
- Couple_NoChild_House: Percentage of households made up of a couple with no children
- Couple_WChild_House: Percentage of households made up of a couple with children
- CurrentlyStudying: Percentage of people who are currently studying
- DeFacto: Percentage of people who are in a de facto marriage
- DiffAddress: Percentage of people who live at a different address to what they did 5 years ago
- DipCert: Percentage of people who have completed a diploma or certificate
- Distributive: Percentage of employed persons who work in wholesale trade, retail trade, transport, post or warehousing related industries
- EmuneratedElsewhere: Percentage of people who receive emuneration outside of Australia, out of the total population plus overseas visitors
- EnglishOnly: Percentage of people who speak only English
- Extractive: Percentage of employed persons who work in extractive industries (includes mining, gas, water, agriculture, waste, electricity)
- FamilyRatio: Average number of people per family
- Finance: Percentage of employed persons who work in finance or insurance related industries
- HighSchool: Percentage of people who have completed high school
- Indigenous: Percentage of people who are Indigenous
- InternetAccess: Percentage of people with access to the internet
- InternetUse: Percentage of people who used internet in the last week (2001 only)
- Islam: Percentage of people affiliated with the Islamic religion
- Judaism: Percentage of people affiliated with the Jewish religion
- Laborer: Percentage of employed persons who work as a laborer
- LFParticipation: Labor force participation rate
- ManagerAdminClericalSales: Percentage of employed persons who work in management, administration, clerical duties and sales

- Married: Percentage of people who are married
- MedianAge: Median age
- MedianFamilyIncome: Median weekly family income (in $)
- MedianHouseholdIncome: Median weekly household income (in $)
- MedianLoanPay: Median mortgage loan repayment amount (of mortgage payments, in $)
- MedianPersonalIncome: Median weekly personal income (in $)
- MedianRent: Median weekly rental payment amount (of those who rent, in $)
- Mortgage: Percentage of dwellings that are on a mortgage
- NoReligion: Percentage of people with no religion
- OneParent_House: Percentage of households made up of one parent with children
- Other_NonChrist: Percentage of people affiliated with a religion other than Christianity, Buddhism, Islam and Judaism
- OtherChrist: Percentage of people affiliated with a denomination of the Christian religion other than Anglican or Catholic
- OtherLanguageHome: Percentage of people who speak a language other than English at home
- Owned: Percentage of dwellings that are owned outright
- Professional: Percentage of employed persons who work as a professional
- PublicHousing: Percentage of dwellings that are owned by the government, and rented out to tenants
- Renting: Percentage of dwellings that are being rented
- SocialServ: Percentage of employed persons who work in education and training, healthcare, social work, community, arts and recreation
- SP_House: Percentage of households occupied by a single person
- Tradesperson: Percentage of employed persons who specialise in a trade
- Transformative: Percentage of employed persons who work in construction or manufacturing related industries
- Unemployed: Unemployment rate
- Volunteer: Percentage of people who work as a volunteer
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.

Details

Note that this data was updated in October 2019. The older versions can be found at ‘https://github.com/ropenscilabs/eechidna data‘

Examples

```
library(eechidna)
library(dplyr)
data(abs2010)
abs2010 %>% select(DivisionNm, MedianAge, Unemployed, NoReligion, MedianPersonalIncome) %>% head()

# Join with two-party preferred voting data
library(ggplot2)
data(tpp10)
election2010 <- left_join(abs2010, tpp10, by = "UniqueID")
# See relationship between personal income and Liberal/National support
ggplot(election2010, aes(x = MedianPersonalIncome, y = LNP_Percent)) + geom_point() + geom_smooth()
```

---

abs2011 *2011 Australian Census data on all 150 electorates*

Description

A dataset containing demographic and other information about each electorate from the Australian Census of Population and Housing. The data were obtained from the Australian Bureau of Statistics, and downloaded from https://www.censusdata.abs.gov.au/datapacks/. Electorate boundaries match those in place at the time of the 2011 Census.

Usage

```
abs2011
```

Format

A data frame with 150 rows with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Name of electorate
- State: State containing electorate
- Population: Total population of electorate
- Area: Area of electorate division in square kilometres
- Age00_04: Percentage of people aged 0-4.
- Age05_14: Percentage of people aged 5-9.
- Age15_19: Percentage of people aged 15-19.
- Age20_24: Percentage of people aged 20-24.
- Age25_34: Percentage of people aged 25-34.
- Age35_44: Percentage of people aged 35-44.
- Age45_54: Percentage of people aged 45-54.

- Age55_64: Percentage of people aged 55-64.
- Age65_74: Percentage of people aged 65-74.
- Age75_84: Percentage of people aged 75-84.
- Age85plus: Percentage of people aged 85 or higher.
- Anglican: Percentage of people affiliated with the Anglican denomination
- AusCitizen: Percentage of people who are Australian Citizens
- AverageHouseholdSize: Average number of people in a household
- BachelorAbv: Percentage of people who have completed a Bachelor degree or above
- Born_Asia: Percentage of people born in Asia
- Born_MidEast: Percentage of people born in the Middle East
- Born_SE_Europe: Percentage of people born in South Eastern Europe
- Born_UK: Percentage of people born in the United Kingdom
- BornElsewhere: Percentage of people who were born overseas, outside of Asia, Middle East, South Eastern Europe and the UK
- BornOverseas_NS: Percentage of people who did not answer the question relating to birthplace
- Buddhism: Percentage of people affiliated with the Buddhist religion
- Catholic: Percentage of people affiliated with the Catholic denomination
- Christianity: Percentage of people affiliated with the Christian religion (of all denominations)
- Couple_NoChild_House: Percentage of households made up of a couple with no children
- Couple_WChild_House: Percentage of households made up of a couple with children
- CurrentlyStudying: Percentage of people who are currently studying
- DeFacto: Percentage of people who are in a de facto marriage
- DiffAddress: Percentage of people who live at a different address to what they did 5 years ago
- DipCert: Percentage of people who have completed a diploma or certificate
- Distributive: Percentage of employed persons who work in wholesale trade, retail trade, transport, post or warehousing related industries
- EmuneratedElsewhere: Percentage of people who receive emuneration outside of Australia, out of the total population plus overseas visitors
- EnglishOnly: Percentage of people who speak only English
- Extractive: Percentage of employed persons who work in extractive industries (includes mining, gas, water, agriculture, waste, electricity)
- FamilyIncome_NS: Percentage of people who did not answer the question relating to family income
- FamilyRatio: Average number of people per family
- Finance: Percentage of employed persons who work in finance or insurance related industries
- HighSchool: Percentage of people who have completed high school
- HighSchool_NS: Rate of nonresponse for questions relating to high school completion

- HouseholdIncome_NS: Percentage of people who did not answer the question relating to household income
- Indigenous: Percentage of people who are Indigenous
- InternetAccess: Percentage of people with access to the internet
- InternetAccess_NS: Rate of nonresponse for questions relating to internal access
- InternetUse: Percentage of people who used internet in the last week (2001 only)
- InternetUse_NS: Rate of nonresponse for questions relating to internet use (2001 only)
- Islam: Percentage of people affiliated with the Islamic religion
- Judaism: Percentage of people affiliated with the Jewish religion
- Laborer: Percentage of employed persons who work as a laborer
- Language_NS: Rate of nonresponse for questions relating to language spoken at home
- LFParticipation: Labor force participation rate
- ManagerAdminClericalSales: Percentage of employed persons who work in management, administration, clerical duties and sales
- Married: Percentage of people who are married
- MedianAge: Median age
- MedianFamilyIncome: Median weekly family income (in $)
- MedianHouseholdIncome: Median weekly household income (in $)
- MedianLoanPay: Median mortgage loan repayment amount (of mortgage payments, in $)
- MedianPersonalIncome: Median weekly personal income (in $)
- MedianRent: Median weekly rental payment amount (of those who rent, in $)
- Mortgage: Percentage of dwellings that are on a mortgage
- NoReligion: Percentage of people with no religion
- OneParent_House: Percentage of households made up of one parent with children
- Other_NonChrist: Percentage of people affiliated with a religion other than Christianity, Buddhism, Islam and Judaism
- OtherChrist: Percentage of people affiliated with a denomination of the Christian religion other than Anglican or Catholic
- OtherLanguageHome: Percentage of people who speak a language other than English at home
- Owned: Percentage of dwellings that are owned outright
- PersonalIncome_NS: Rate of nonresponse for questions relating to personal income
- Professional: Percentage of employed persons who work as a professional
- PublicHousing: Percentage of dwellings that are owned by the government, and rented out to tenants
- Religion_NS: Rate of nonresponse for questions relating to religion
- Rent_NS: Rate of nonresponse for questions relating to rental costs
- Renting: Percentage of dwellings that are being rented
- SocialServ: Percentage of employed persons who work in education and training, healthcare, social work, community, arts and recreation

- SP_House: Percentage of households occupied by a single person
- Tenure_NS: Rate of nonresponse for questions relating to tenure
- Tradesperson: Percentage of employed persons who specialise in a trade
- Transformative: Percentage of employed persons who work in construction or manufacturing related industries
- Unemployed: Unemployment rate
- University_NS: Rate of nonresponse for questions relating to University
- Volunteer: Percentage of people who work as a volunteer
- Volunteer_NS: Rate of nonresponse for questions relating to working as a volunteer

Examples

```
library(eechidna)
library(dplyr)
data(abs2011)
abs2011 %>% select(DivisionNm, MedianAge, Unemployed, NoReligion, MedianPersonalIncome) %>% head()
```

`abs2013` *Imputed Australian Census data for the electorates in place at time of the 2013 Federal election*

Description

A dataset containing estimated demographic and other information about each electorate. The data is imputed using Census information from 2011 and 2016. See the imputing-census-data vignette for more details.

Usage

```
abs2013
```

Format

A data frame with 150 rows with the following variables:

- Population: Number of people in electorate
- DivisionNm: Name of electorate
- Age00_04: Percentage of people aged 0-4.
- Age05_14: Percentage of people aged 5-9.
- Age15_19: Percentage of people aged 15-19.
- Age20_24: Percentage of people aged 20-24.
- Age25_34: Percentage of people aged 25-34.
- Age35_44: Percentage of people aged 35-44.

- Age45_54: Percentage of people aged 45-54.
- Age55_64: Percentage of people aged 55-64.
- Age65_74: Percentage of people aged 65-74.
- Age75_84: Percentage of people aged 75-84.
- Age85plus: Percentage of people aged 85 or higher.
- Anglican: Percentage of people affiliated with the Anglican denomination
- AusCitizen: Percentage of people who are Australian Citizens
- AverageHouseholdSize: Average number of people in a household
- BachelorAbv: Percentage of people who have completed a Bachelor degree or above
- Born_Asia: Percentage of people born in Asia
- Born_MidEast: Percentage of people born in the Middle East
- Born_SE_Europe: Percentage of people born in South Eastern Europe
- Born_UK: Percentage of people born in the United Kingdom
- BornElsewhere: Percentage of people who were born overseas, outside of Asia, Middle East, South Eastern Europe and the UK
- Buddhism: Percentage of people affiliated with the Buddhist religion
- Catholic: Percentage of people affiliated with the Catholic denomination
- Christianity: Percentage of people affiliated with the Christian religion (of all denominations)
- Couple_NoChild_House: Percentage of households made up of a couple with no children
- Couple_WChild_House: Percentage of households made up of a couple with children
- CurrentlyStudying: Percentage of people who are currently studying
- DeFacto: Percentage of people who are in a de facto marriage
- DiffAddress: Percentage of people who live at a different address to what they did 5 years ago
- DipCert: Percentage of people who have completed a diploma or certificate
- Distributive: Percentage of employed persons who work in wholesale trade, retail trade, transport, post or warehousing related industries
- EmuneratedElsewhere: Percentage of people who receive emuneration outside of Australia, out of the total population plus overseas visitors
- EnglishOnly: Percentage of people who speak only English
- Extractive: Percentage of employed persons who work in extractive industries (includes mining, gas, water, agriculture, waste, electricity)
- FamilyRatio: Average number of people per family
- Finance: Percentage of employed persons who work in finance or insurance related industries
- HighSchool: Percentage of people who have completed high school
- Indigenous: Percentage of people who are Indigenous
- InternetAccess: Percentage of people with access to the internet
- InternetUse: Percentage of people who used internet in the last week (2001 only)
- Islam: Percentage of people affiliated with the Islamic religion

- Judaism: Percentage of people affiliated with the Jewish religion
- Laborer: Percentage of employed persons who work as a laborer
- LFParticipation: Labor force participation rate
- ManagerAdminClericalSales: Percentage of employed persons who work in management, administration, clerical duties and sales
- Married: Percentage of people who are married
- MedianAge: Median age
- MedianFamilyIncome: Median weekly family income (in $)
- MedianHouseholdIncome: Median weekly household income (in $)
- MedianLoanPay: Median mortgage loan repayment amount (of mortgage payments, in $)
- MedianPersonalIncome: Median weekly personal income (in $)
- MedianRent: Median weekly rental payment amount (of those who rent, in $)
- Mortgage: Percentage of dwellings that are on a mortgage
- NoReligion: Percentage of people with no religion
- OneParent_House: Percentage of households made up of one parent with children
- Other_NonChrist: Percentage of people affiliated with a religion other than Christianity, Buddhism, Islam and Judaism
- OtherChrist: Percentage of people affiliated with a denomination of the Christian religion other than Anglican or Catholic
- OtherLanguageHome: Percentage of people who speak a language other than English at home
- Owned: Percentage of dwellings that are owned outright
- Professional: Percentage of employed persons who work as a professional
- PublicHousing: Percentage of dwellings that are owned by the government, and rented out to tenants
- Renting: Percentage of dwellings that are being rented
- SocialServ: Percentage of employed persons who work in education and training, healthcare, social work, community, arts and recreation
- SP_House: Percentage of households occupied by a single person
- Tradesperson: Percentage of employed persons who specialise in a trade
- Transformative: Percentage of employed persons who work in construction or manufacturing related industries
- Unemployed: Unemployment rate
- Volunteer: Percentage of people who work as a volunteer
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.

Details

Note that this data was updated in October 2019. The older versions can be found at ‘https://github.com/ropenscilabs/eechidna data‘

Examples

```
library(eechidna)
library(dplyr)
data(abs2013)
abs2013 %>% select(DivisionNm, MedianAge, Unemployed, NoReligion, MedianPersonalIncome) %>% head()

# Join with two-party preferred voting data
library(ggplot2)
data(tpp13)
election2013 <- left_join(abs2013, tpp13, by = "UniqueID")
# See relationship between personal income and Liberal/National support
ggplot(election2013, aes(x = MedianPersonalIncome, y = LNP_Percent)) + geom_point() + geom_smooth()
```

---

abs2016 *2016 Australian Census data on all 150 electorates*

Description

A dataset containing demographic and other information about each electorate from the Australian Census of Population and Housing. The data were obtained from the Australian Bureau of Statistics, and downloaded from https://www.censusdata.abs.gov.au/datapacks/. Electorate boundaries match those in place at the time of the 2016 Federal election.

Usage

```
abs2016
```

Format

A data frame with 150 rows with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Name of electorate
- State: State containing electorate
- Population: Total population of electorate
- Area: Area of electorate division in square kilometres
- Age00_04: Percentage of people aged 0-4.
- Age05_14: Percentage of people aged 5-9.
- Age15_19: Percentage of people aged 15-19.
- Age20_24: Percentage of people aged 20-24.
- Age25_34: Percentage of people aged 25-34.
- Age35_44: Percentage of people aged 35-44.
- Age45_54: Percentage of people aged 45-54.

- Age55_64: Percentage of people aged 55-64.
- Age65_74: Percentage of people aged 65-74.
- Age75_84: Percentage of people aged 75-84.
- Age85plus: Percentage of people aged 85 or higher.
- Anglican: Percentage of people affiliated with the Anglican denomination
- AusCitizen: Percentage of people who are Australian Citizens
- AverageHouseholdSize: Average number of people in a household
- BachelorAbv: Percentage of people who have completed a Bachelor degree or above
- Born_Asia: Percentage of people born in Asia
- Born_MidEast: Percentage of people born in the Middle East
- Born_SE_Europe: Percentage of people born in South Eastern Europe
- Born_UK: Percentage of people born in the United Kingdom
- BornElsewhere: Percentage of people who were born overseas, outside of Asia, Middle East, South Eastern Europe and the UK
- BornOverseas_NS: Percentage of people who did not answer the question relating to birthplace
- Buddhism: Percentage of people affiliated with the Buddhist religion
- Catholic: Percentage of people affiliated with the Catholic denomination
- Christianity: Percentage of people affiliated with the Christian religion (of all denominations)
- Couple_NoChild_House: Percentage of households made up of a couple with no children
- Couple_WChild_House: Percentage of households made up of a couple with children
- CurrentlyStudying: Percentage of people who are currently studying
- DeFacto: Percentage of people who are in a de facto marriage
- DiffAddress: Percentage of people who live at a different address to what they did 5 years ago
- DipCert: Percentage of people who have completed a diploma or certificate
- Distributive: Percentage of employed persons who work in wholesale trade, retail trade, transport, post or warehousing related industries
- EmuneratedElsewhere: Percentage of people who receive emuneration outside of Australia, out of the total population plus overseas visitors
- EnglishOnly: Percentage of people who speak only English
- Extractive: Percentage of employed persons who work in extractive industries (includes mining, gas, water, agriculture, waste, electricity)
- FamilyIncome_NS: Percentage of people who did not answer the question relating to family income
- FamilyRatio: Average number of people per family
- Finance: Percentage of employed persons who work in finance or insurance related industries
- HighSchool: Percentage of people who have completed high school
- HighSchool_NS: Rate of nonresponse for questions relating to high school completion

- HouseholdIncome_NS: Percentage of people who did not answer the question relating to household income
- Indigenous: Percentage of people who are Indigenous
- InternetAccess: Percentage of people with access to the internet
- InternetAccess_NS: Rate of nonresponse for questions relating to internal access
- InternetUse: Percentage of people who used internet in the last week (2001 only)
- InternetUse_NS: Rate of nonresponse for questions relating to internet use (2001 only)
- Islam: Percentage of people affiliated with the Islamic religion
- Judaism: Percentage of people affiliated with the Jewish religion
- Laborer: Percentage of employed persons who work as a laborer
- Language_NS: Rate of nonresponse for questions relating to language spoken at home
- LFParticipation: Labor force participation rate
- ManagerAdminClericalSales: Percentage of employed persons who work in management, administration, clerical duties and sales
- Married: Percentage of people who are married
- MedianAge: Median age
- MedianFamilyIncome: Median weekly family income (in $)
- MedianHouseholdIncome: Median weekly household income (in $)
- MedianLoanPay: Median mortgage loan repayment amount (of mortgage payments, in $)
- MedianPersonalIncome: Median weekly personal income (in $)
- MedianRent: Median weekly rental payment amount (of those who rent, in $)
- Mortgage: Percentage of dwellings that are on a mortgage
- NoReligion: Percentage of people with no religion
- OneParent_House: Percentage of households made up of one parent with children
- Other_NonChrist: Percentage of people affiliated with a religion other than Christianity, Buddhism, Islam and Judaism
- OtherChrist: Percentage of people affiliated with a denomination of the Christian religion other than Anglican or Catholic
- OtherLanguageHome: Percentage of people who speak a language other than English at home
- Owned: Percentage of dwellings that are owned outright
- PersonalIncome_NS: Rate of nonresponse for questions relating to personal income
- Professional: Percentage of employed persons who work as a professional
- PublicHousing: Percentage of dwellings that are owned by the government, and rented out to tenants
- Religion_NS: Rate of nonresponse for questions relating to religion
- Rent_NS: Rate of nonresponse for questions relating to rental costs
- Renting: Percentage of dwellings that are being rented
- SocialServ: Percentage of employed persons who work in education and training, healthcare, social work, community, arts and recreation

- SP_House: Percentage of households occupied by a single person
- Tenure_NS: Rate of nonresponse for questions relating to tenure
- Tradesperson: Percentage of employed persons who specialise in a trade
- Transformative: Percentage of employed persons who work in construction or manufacturing related industries
- Unemployed: Unemployment rate
- University_NS: Rate of nonresponse for questions relating to University
- Volunteer: Percentage of people who work as a volunteer
- Volunteer_NS: Rate of nonresponse for questions relating to working as a volunteer

Examples

```
library(eechidna)
library(dplyr)
data(abs2016)
abs2016 %>% select(DivisionNm, MedianAge, Unemployed, NoReligion, MedianPersonalIncome) %>% head()

# Join with two-party preferred voting data
library(ggplot2)
data(tpp16)
election2016 <- left_join(abs2016, tpp16, by = "UniqueID")
# See relationship between personal income and Liberal/National support
ggplot(election2016, aes(x = MedianPersonalIncome, y = LNP_Percent)) + geom_point() + geom_smooth()
```

---

abs2019 *Imputed Australian Census data for the electorates in place at time of the 2019 Federal election*

Description

A dataset containing estimated demographic and other information about each electorate. The data is imputed using Census information from 2016 only. See the imputing-census-data vignette for more details.

Usage

```
abs2019
```

Format

A data frame with 150 rows with the following variables:

- Population: Number of people in electorate
- DivisionNm: Name of electorate
- Age00_04: Percentage of people aged 0-4.
- Age05_14: Percentage of people aged 5-9.

- Age15_19: Percentage of people aged 15-19.
- Age20_24: Percentage of people aged 20-24.
- Age25_34: Percentage of people aged 25-34.
- Age35_44: Percentage of people aged 35-44.
- Age45_54: Percentage of people aged 45-54.
- Age55_64: Percentage of people aged 55-64.
- Age65_74: Percentage of people aged 65-74.
- Age75_84: Percentage of people aged 75-84.
- Age85plus: Percentage of people aged 85 or higher.
- Anglican: Percentage of people affiliated with the Anglican denomimation
- AusCitizen: Percentage of people who are Australian Citizens
- AverageHouseholdSize: Average number of people in a household
- BachelorAbv: Percentage of people who have completed a Bachelor degree or above
- Born_Asia: Percentage of people born in Asia
- Born_MidEast: Percentage of people born in the Middle East
- Born_SE_Europe: Percentage of people born in South Eastern Europe
- Born_UK: Percentage of people born in the United Kingdom
- BornElsewhere: Percentage of people who were born overseas, outside of Asia, Middle East, South Eastern Europe and the UK
- Buddhism: Percentage of people affiliated with the Buddhist religion
- Catholic: Percentage of people affiliated with the Catholic denomimation
- Christianity: Percentage of people affiliated with the Christian religion (of all denominations)
- Couple_NoChild_House: Percentage of households made up of a couple with no children
- Couple_WChild_House: Percentage of households made up of a couple with children
- CurrentlyStudying: Percentage of people who are currently studying
- DeFacto: Percentage of people who are in a de facto marriage
- DiffAddress: Percentage of people who live at a different address to what they did 5 years ago
- DipCert: Percentage of people who have completed a diploma or certificate
- Distributive: Percentage of employed persons who work in wholesale trade, retail trade, transport, post or warehousing related industries
- EmuneratedElsewhere: Percentage of people who receive emuneration outside of Australia, out of the total population plus overseas visitors
- EnglishOnly: Percentage of people who speak only English
- Extractive: Percentage of employed persons who work in extractive industries (includes mining, gas, water, agriculture, waste, electricity)
- FamilyRatio: Average number of people per family
- Finance: Percentage of employed persons who work in finance or insurance related industries
- HighSchool: Percentage of people who have completed high school

- Indigenous: Percentage of people who are Indigenous
- InternetAccess: Percentage of people with access to the internet
- InternetUse: Percentage of people who used internet in the last week (2001 only)
- Islam: Percentage of people affiliated with the Islamic religion
- Judaism: Percentage of people affiliated with the Jewish religion
- Laborer: Percentage of employed persons who work as a laborer
- LFParticipation: Labor force participation rate
- ManagerAdminClericalSales: Percentage of employed persons who work in management, administration, clerical duties and sales
- Married: Percentage of people who are married
- MedianAge: Median age
- MedianFamilyIncome: Median weekly family income (in $)
- MedianHouseholdIncome: Median weekly household income (in $)
- MedianLoanPay: Median mortgage loan repayment amount (of mortgage payments, in $)
- MedianPersonalIncome: Median weekly personal income (in $)
- MedianRent: Median weekly rental payment amount (of those who rent, in $)
- Mortgage: Percentage of dwellings that are on a mortgage
- NoReligion: Percentage of people with no religion
- OneParent_House: Percentage of households made up of one parent with children
- Other_NonChrist: Percentage of people affiliated with a religion other than Christianity, Buddhism, Islam and Judaism
- OtherChrist: Percentage of people affiliated with a denomination of the Christian religion other than Anglican or Catholic
- OtherLanguageHome: Percentage of people who speak a language other than English at home
- Owned: Percentage of dwellings that are owned outright
- Professional: Percentage of employed persons who work as a professional
- PublicHousing: Percentage of dwellings that are owned by the government, and rented out to tenants
- Renting: Percentage of dwellings that are being rented
- SocialServ: Percentage of employed persons who work in education and training, healthcare, social work, community, arts and recreation
- SP_House: Percentage of households occupied by a single person
- Tradesperson: Percentage of employed persons who specialise in a trade
- Transformative: Percentage of employed persons who work in construction or manufacturing related industries
- Unemployed: Unemployment rate
- Volunteer: Percentage of people who work as a volunteer
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.

Examples

```
library(eechidna)
library(dplyr)
data(abs2019)
abs2019 %>% select(DivisionNm, MedianAge, Unemployed, NoReligion, MedianPersonalIncome) %>% head()

# Join with two-party preferred voting data
library(ggplot2)
data(tpp19)
election2019 <- left_join(abs2019, tpp19, by = "UniqueID")
# See relationship between personal income and Liberal/National support
ggplot(election2019, aes(x = MedianPersonalIncome, y = LNP_Percent)) + geom_point() + geom_smooth()
```

`aec_add_carto_f` *aec_add_carto_f - computes and binds the cartogram coordinates to original data*

Description

Add the cartogram locations as new variables to original data and make any of these that were not made equal to the original centroids. This is simply all of the Australian electoral cartogram steps in one hit.

Usage

```
aec_add_carto_f(nat_data)
```

Arguments

`nat_data`	subset of data with centroids of electoral divisions

Examples

```
library(eechidna)
library(dplyr)
library(ggplot2)

nat_map16 <- nat_map_download(2016)
nat_data16 <- nat_data_download(2016)

nat_data16 <- nat_data16 %>% select(-c(x,y)) # remove existing cartogram coordinates
nat_data_cart <- aec_add_carto_f(nat_data16)
# Map theme
library(ggthemes)

ggplot(data=nat_data_cart, aes(map_id=id)) +
  geom_map(map = nat_map16, fill="grey90", colour="white") +
    geom_point(aes(x=x, y=y), size=2, alpha=0.4,
                colour="#572d2c", inherit.aes=FALSE) +
```

```
  expand_limits(x=nat_map16$long, y=nat_map16$lat) +
  theme_map() + coord_equal()
```

---

aec_carto_f *aec_carto_f - run dorling on data centers*

Description

The dorling algorithm creates a non-contiguous cartogram by shifting circles to alleviate overlap, while roughly maintaining geographic proximity.

Usage

```
aec_carto_f(aec_data_sub, polygon.vertex = 6, name.text = TRUE,
  dist.ratio = dist.ratio, iteration = 100, xlab = "", ylab = "",
  ...)
```

Arguments

aec_data_sub	subset of data with centroids of electoral divisions
polygon.vertex	The number of vertice of the circle. Default to be 100. If polygon.vertex=4 then diamonds applies. If polygon.vertex=6, then hexagon applies.
name.text	whether to print the region names on the circles or polygons.
dist.ratio	The threshold to determine whether an attract force is added. It is applied to the ratio of the distance between two centroids and the sum of the two radii.
iteration	The limit of the number of iterations. Default to be 9999.
xlab	Label for dorling x axis, intermediate drawing
ylab	Label for dorling y axis, intermediate drawing
...	arguments to dorling function

Examples

```
library(dplyr)
library(ggplot2)
nat_map16 <- nat_map_download(2016)
nat_data16 <- nat_data_download(2016)
nat_data16 <- nat_data16 %>% select(-c(x,y)) # remove existing cartogram coordinates
adelaide <- aec_extract_f(nat_data16, ctr=c(138.6, -34.9), expand=c(2,3))
adelaide_carto <- aec_carto_f(adelaide) %>% rename(id=region)
ggplot(data=nat_map16) +
  geom_path(aes(x=long, y=lat, group=group, order=order),
                colour="grey50") +
  geom_point(data=adelaide_carto, aes(x=x, y=y), size=4, alpha=0.4,
        colour="#f0027f") +
        xlim(c(136, 140)) + ylim(-36, -33) +
        coord_equal()
```

```
adelaide_all <- merge(adelaide, adelaide_carto, by="id")
ggplot(data=nat_map16) +
  geom_path(aes(x=long, y=lat, group=group, order=order),
                colour="grey50") +
  geom_point(data=adelaide_all, aes(x=long_c, y=lat_c), size=2, alpha=0.4,
             colour="#f0027f") +
  geom_point(data=adelaide_all, aes(x=x, y=y), size=2, alpha=0.4,
                            colour="#f0027f") +
  geom_segment(data=adelaide_all,
       aes(x=long_c, xend=x, y=lat_c, yend=y), colour="#f0027f") +
  xlim(c(136, 140)) + ylim(-37, -33) +
  coord_equal()
```

---

aec_carto_join_f *aec_carto_join_f - bind the cartogram coordinates to original data*

Description

Add the cartogram locations as new variables to original data and make any of these that were not made equal to the original centroids

Usage

```
aec_carto_join_f(aec_data, aec_carto)
```

Arguments

aec_data	subset of data with centroids of electoral divisions
aec_carto	centers

Examples

```
library(dplyr)
library(ggplot2)
nat_map16 <- nat_map_download(2016)
nat_data16 <- nat_data_download(2016)
nat_data16 <- nat_data16 %>% select(-c(x,y)) # remove existing cartogram coordinates
cities <- list(c(151.2, -33.8), # Sydney
c(153.0, -27.5), # Brisbane
c(145.0, -37.8), # Melbourne
c(138.6, -34.9), # Adelaide,
c(115.9, -32.0)) # Perth
expand <- list(c(2,3.8), c(2,3), c(2.6,4.1), c(4,3), c(12,6))
nat_carto <- purrr::map2(.x=cities, .y=expand,
.f=aec_extract_f, aec_data=nat_data16) %>%
  purrr::map_df(aec_carto_f) %>%
    mutate(region=as.integer(as.character(region))) %>%
```

```
      rename(id=region)
nat_data_cart <- aec_carto_join_f(nat_data16, nat_carto)
library(ggthemes)

ggplot(data=nat_data16, aes(map_id=id)) +
  geom_map(map = nat_map16, fill="grey90", colour="white") +
    geom_point(data=nat_data_cart, aes(x=x, y=y), size=2, alpha=0.4,
                colour="#572d2c", inherit.aes=FALSE) +
    expand_limits(x=nat_map16$long, y=nat_map16$lat) +
    theme_map() + coord_equal()
```

---

aec_extract_f *aec_extract_f - extract subsets geographically*

Description

The dorling algorithm doesn't work on the entire country, because it is very clustered at the cities. To get a reasonable cartogram we need to extract out the cities, expand these with dorling independently. This function does the extraction.

Usage

```
aec_extract_f(aec_data, ctr = c(151.2, -33.8), expand = c(3, 4.5), ...)
```

Arguments

aec_data	data with centroids of electoral divisions
ctr	centroids of subset
expand	how large a chunk to cut out
...	other arguments

Examples

```
library(dplyr)
library(ggplot2)
nat_map16 <- nat_map_download(2016)
nat_data16 <- nat_data_download(2016)
nat_data16 <- nat_data16 %>% select(-c(x,y)) # remove existing cartogram coordinates
adelaide <- aec_extract_f(nat_data16, ctr=c(138.6, -34.9), expand=c(2,3))
ggplot(data=nat_map16) +
  geom_polygon(aes(x=long, y=lat, group=group, order=order),
    fill="grey90", colour="white") +
  geom_point(data=adelaide, aes(x=long_c, y=lat_c), size=2, alpha=0.4,
    colour="#f0027f") +
  xlim(c(136, 142)) + ylim(-36, -33) +
  coord_equal()
```

allocate_electorate *Determine which electoral division contains the centroid from each of the Census polygons.*

Description

Using the electoral boundaries at the time of an election and the centroids from the SA1 polygons from a neighbouring Census, allocate each SA1 to the electoral division that contains its centroid.

Usage

```
allocate_electorate(centroids_ls, electorates_sf, census_year = NA,
  election_year = NA)
```

Arguments

centroids_ls	list containing centroids as SpatialPoints and a dataframe with basic data on each polygon (e.g. name)
electorates_sf	shapefile with electoral boundaries
census_year	census year
election_year	election year

Value

data frame detailing which electoral division each Census polygon is allocated to

Examples

```
## Not run:
# Mapping each SA1 from the 2011 Census to the 2013 electoral boundaries
mapping_c11_e13 <- allocate_electorate(centroids_ls = centroids_sa1_2011, electorates_sf = sF_13,
census_year = "2011", election_year = "2013")

## End(Not run)
```

circle *Draw a circle*

Description

##' From https://github.com/chxy/cartogram/blob/master/R/dorling.R Not exported here, but needed for aec_carto_f

Usage

```
circle(xvec, yvec, rvec, vertex = 100, border = 1, col = NULL,
  add = TRUE, square = FALSE, ...)
```

Arguments

xvec	X-coordinates
yvec	Y-coordinates
rvec	Radii
vertex	The number of vertices of the circle
border	Color of border
col	Color to render in circle
add	Whether the circles are added to another plot.
square	A logical value to determine whether to draw squares.
...	other things

Details

This function is used to compute the locations of the circle border and draw multiple circles. It borrows the code from plotrix::draw.circle

Examples

```
## Not run:
x=y=1:5
r=5:1/5
circle(x,y,r,add=FALSE,asp=1)
circle(x,y,r,vertex=6,add=TRUE)  # hexagon
circle(x,y,r,vertex=4,add=TRUE)  # diamond
circle(x,y,r,square=TRUE,add=TRUE)  # square

## End(Not run)
```

---

complete_color *Auto complete (or cut) a vector to a fixed length*

Description

From https://github.com/chxy/cartogram/blob/master/R/dorling.R Not exported here, but needed for aec_carto_f

Usage

```
complete_color(cl, targetlen)
```

Arguments

cl	a vector of colors
targetlen	the target length

Value

a vector of completed cl with length n

Examples

```
## Not run:
complete_color('red',5)
complete_color(c('red','blue'),5)
complete_color(c('red','blue','green','yellow','pink','grey'),5)

## End(Not run)
```

`dorling` *Produce a Pseudo-Dorling Cartogram.*

Description

From https://github.com/chxy/cartogram/blob/master/R/dorling.R Not exported here, but needed for aec_carto_f

Usage

```
dorling(name, centroidx, centroidy, density, nbr = NULL,
  shared.border = NULL, color = NULL, tolerance = 0.1,
  dist.ratio = 1.2, iteration = 9999, polygon.vertex = 100,
  animation = FALSE, sleep.time = 0.3, nbredge = ifelse(is.null(nbr),
  FALSE, TRUE), name.text = TRUE, ggplot2 = FALSE, ...)
```

Arguments

`name`	A vector of region names.
`centroidx`	A vector of x-coordinates of the regions.
`centroidy`	A vector of y-coordinates of the regions.
`density`	A vector of the variable of interest. It will be used as the radii of the circles.
`nbr`	A list of the neighbors of every region. Each element is a vector of all the neighbor names of a region. If nbr=NULL, then it is assumed that no region has any neighbors. If nbr is not NULL, then names should be given to all the elements of the list, for matching the neighbors with the host region name, otherwise the parameter "name" (a character vector) will be used as the element names of nbr. Besides, any values in nbr that are not in "name" will be removed. The length of nbr could be different from the length of "name", but any element in nbr whose name is not in "name" will be removed too.
`shared.border`	A matrix of the counts of shared borders, typically generated from the function `border_summary_length()`. It is used to scale the attract force.
`color`	a vector of color to fill in the circles or polygons. Auto-completed if the length does not match with name.

tolerance	Tolerant value for the sum of overlapped radii.
dist.ratio	The threshold to determine whether an attract force is added. It is applied to the ratio of the distance between two centroids and the sum of the two radii.
iteration	The limit of the number of iterations. Default to be 9999.
polygon.vertex	The number of vertice of the circle. Default to be 100. If polygon.vertex=4 then diamonds applies. If polygon.vertex=6, then hexagon applies.
animation	Whether to show the movements of centroids.
sleep.time	Only works when animation=TRUE.
nbredge	whether to draw the lines between neighbor regions.
name.text	whether to print the region names on the circles or polygons.
ggplot2	whether to use ggplot2 to draw the cartogram.
...	other things

`extract_centroids` *Extract centroids from the polygons within a shapefile.*

Description

Extract centroids from the polygons within a shapefile.

Usage

```
extract_centroids(shapefile)
```

Arguments

shapefile	SpatialPolygonsDataFrame containing polygons

Value

list containing centroids as SpatialPoints and a dataframe with basic data on each polygon (e.g. name)

Examples

```
## Not run:
sF_download(year = 2016)
electorate_centroids_2016 <- extract_centroids(sF_16)

## End(Not run)
```

`firstpref_pollingbooth_download` *Download first preference voting data from each polling booth, from the six Australian Federal elections between 2001 and 2016.*

Description

Download first preference voting data from each polling booth, from the six Australian Federal elections between 2001 and 2016.

Usage

```
firstpref_pollingbooth_download(...)
```

Arguments

...	Additional arguments passed to 'download.file'
	Downloads and returns first preference votes for candidates in the House of Representatives, for each polling both, in the seven Australian Federal elections between 2001 and 2016.

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- DivisionID: Electoral division ID
- DivisionNm: Electoral division name
- PollingPlaceID: Polling place ID
- PollingPlace: Polling place name
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- BallotPosition: Candidate's position on the ballot
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- OrdinaryVotes: Number of ordinary votes cast at the polling place for the candidate
- Swing: Percentage point change in ordinary votes for the party from the previous election
- PremisesPostCode: Post code of polling booth
- Latitude: Coordinates
- Longitude: Coordinates
- year: Election year

Value

A data frame containing first preference votes

A dataset containing first preference vote counts, candidate names, polling place locations, and other results for the House of Representatives from the 2001, 2004, 2007, 2010, 2013 and 2016 Australian federal elections. This data set is obtained using the 'firstpref_pollingbooth_download' function. The data were obtained from the Australian Electoral Commission.

Examples

```
## Not run:
fp_pp <- firstpref_pollingbooth_download()
library(dplyr)
fp_pp %>% filter(year == 2016) %>% arrange(-OrdinaryVotes) %>% head

## End(Not run)
```

`fp01` *2001 Australian Federal election data: First preference votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing first preference vote counts, candidate names, and other results for the House of Representatives from the 2001 Australian federal election. The data were obtained from the Australian Electoral Commission, and downloaded from https://www.aec.gov.au/About_AEC/Publications/statistics/files/aec-2001-election-statistics.zip.

Usage

```
fp01
```

Format

A data frame with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- StateAb: Abbreviation for state name
- DivisionNm: Electoral division name
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- Percent: Percentage of ordinary votes for the candidate

`fp04` *2004 Australian Federal election data: First preference votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing first preference vote counts, candidate names, and other results for the House of Representatives from the 2004 Australian federal election. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/12246/results/HouseDownloadsMenu-12246-csv.htm and http://www.aec.gov.au/elections/federal_elections/2004/downloads.htm.

Usage

```
fp04
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- OrdinaryVotes: Number of ordinary votes cast at the electorate for the candidate
- Percent: Percentage of ordinary votes for the candidate

`fp07` *2007 Australian Federal election data: First preference votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing first preference vote counts, candidate names, and other results for the House of Representatives from the 2007 Australian federal election. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/13745/Website/HouseDownloadsMenu-13745-csv.htm and http://www.aec.gov.au/elections/federal_elections/2007/downloads.htm.

Usage

```
fp07
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- OrdinaryVotes: Number of ordinary votes cast at the electorate for the candidate
- Percent: Percentage of ordinary votes for the candidate

`fp10` *2010 Australian Federal election data: First preference votes for candidates (House of House of Representative for each electorate*

Description

A dataset containing first preference vote counts, candidate names, and other results for the House of Representatives from the 2010 Australian federal election. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/15508/Website/HouseDownloadsMenu-15508-csv.htm and http://www.aec.gov.au/elections/federal_elections/2010/downloads.htm.

Usage

```
fp10
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- OrdinaryVotes: Number of ordinary votes cast at the electorate for the candidate
- Percent: Percentage of ordinary votes for the candidate

`fp13` *2013 Australian Federal election data: First preference votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing first preference vote counts, candidate names, and other results for the House of Representatives from the 2013 Australian federal election. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/17496/Website/HouseDownloadsMenu-17496-csv.htm and http://www.aec.gov.au/elections/federal_elections/2013/downloads.htm.

Usage

```
fp13
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- OrdinaryVotes: Number of ordinary votes cast at the electorate for the candidate
- Percent: Percentage of ordinary votes for the candidate

`fp16` *2016 Australian Federal election data: First preference votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing first preference vote counts, candidate names, and other results for the House of Representatives from the 2016 Australian federal election. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/20499/Website/HouseDownloadsMenu-20499-csv.htm and http://www.aec.gov.au/elections/federal_elections/2016/downloads.htm.

Usage

```
fp16
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- OrdinaryVotes: Number of ordinary votes cast at the electorate for the candidate
- Percent: Percentage of ordinary votes for the candidate

`fp19` *2019 Australian Federal election data: First preference votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing first preference vote counts, candidate names, and other results for the House of Representatives from the 2019 Australian federal election. The data were obtained from the Australian Electoral Commission, and downloaded from https://results.aec.gov.au/24310/Website/HouseDownloadsMenu-24310-Csv.htm.

Usage

```
fp19
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- OrdinaryVotes: Number of ordinary votes cast at the electorate for the candidate
- Percent: Percentage of ordinary votes for the candidate

`get_electorate_shapes` *Extract shapefiles (of Australian electorates) from raw file into fortified map and data components.*

Description

Extract polygon information and demographics for each of Australia's electorates. The map and data corresponding to the shapefiles of the 2013 Australian electorates (available at http://www.aec.gov.au/Electorates/gis/gis_datadownload.htm) are part of this package as nat_map.rda and nat_data.rda in the data folder. The function will take several minutes to complete.

Usage

```
get_electorate_shapes(path_to_shapeFile = NULL, sF = NULL,
  mapinfo = TRUE, layer = NULL, tolerance = 0.005)
```

Arguments

`path_to_shapeFile`	path to object in local machine (only if shapefile has not already loaded)
`sF`	Shapefile object loaded to environment using load_shapefile
`mapinfo`	Is the data mapInfo format, rather than ESRI? default=TRUE
`layer`	If the format is mapInfo, the layer name also needs to be provided, default is NULL
`tolerance`	Numerical tolerance value to be used by the Douglas-Peuker algorithm (only if shapefile has not already loaded)

Value

list with two data frames: map and data; 'map' is a data set with geographic latitude and longitude, and a grouping variable to define each entity. The 'data' data set consists of demographic or geographic information for each electorate, such as size in square kilometers or corresponding state. Additionally, geographic latitude and longitude of the electorate's centroid are added.

Examples

```
## Not run:
# Get electorate shapes in data.frame format

# Path to your shapefile
fl <- "local/path/to/shapefile.shp"

map_and_data16 <- get_electorate_shapes(path_to_shapefile = fl)

## End(Not run)
```

launch_app *Shiny app for exploring census and electorate data*

Description

Shiny app for exploring census and electorate data

Usage

```
launch_app(election_year = 2016, age = c("Age00_04", "Age05_14",
  "Age15_19", "Age20_24", "Age25_34", "Age35_44", "Age45_54", "Age55_64",
  "Age65_74", "Age75_84", "Age85plus"), religion = c("Christianity",
  "Catholic", "Buddhism", "Islam", "Judaism", "NoReligion"),
  other = c("AusCitizen", "MedianPersonalIncome", "Unemployed",
  "BachelorAbv", "Indigenous", "EnglishOnly", "OtherLanguageHome",
  "Married", "DeFacto", "FamilyRatio", "Owned"), palette = c("#1B9E77",
  "#F0027F", "#E6AB02", "#66A61E", "#7570B3", "#D95F02", "#3690C0"))
```

Arguments

election_year	Year of Federal election to be explored (2001, 2004, 2007, 2010, 2013 or 2016)
age	Age variables to show. Variable(s) should match column names from abs2016. By default, all variables are shown.
religion	Religion variables to show. Variable(s) should match column names from abs2016. By default, all variables are shown.
other	Other census variables to show. Variable(s) should match column names from abs2016. By default, all variables are shown.
palette	a named character vector of selection colors. The vector names are used as the display in the drop-down control.

Author(s)

Carson Sievert

Examples

```
## Not run:
library(shiny)
library(plotly)
library(tidyverse)
# for comparing labor/liberal
launch_app(
  election_year = 2016,
  age = c("Age20_24", "Age25_34", "Age55_64"),
  religion = c("Christianity", "Catholic", "NoReligion"),
  other = c("AusCitizen", "MedianPersonalIncome", "Unemployed")
)
```

```
# for inspecting highly contested areas
launch_app(
  election_year = 2016,
  age = c("Age25_34", "Age35_44", "Age55_64"),
  religion = c("Christianity", "Catholic", "NoReligion"),
  other = c("Owned", "Indigenous", "AusCitizen")
)

launch_app()


## End(Not run)
```

---

load_shapefile *Load shapefile of Australia into R*

Description

Load shapefile into R as a SpatialDataFrame, extract polygon information, thin polygon, fix any problematic polygons, and format variable names. "nat_map" and "nat_data" objects for every Australian federal election between 2001-2016 can be readily loaded from the package for analysis.

Usage

```
load_shapefile(path_to_shapeFile, tolerance = 0.005)
```

Arguments

path_to_shapeFile	path to object in local machine
tolerance	numerical tolerance value to be used by the Douglas-Peuker algorithm

Details

The function will take several minutes to complete.

Value

object of class SpatialPolygonsDataFrame

Examples

```
## Not run:
# Load electorate shapefile into R

# Path to your shapefile
fl <- "local/path/to/shapefile.shp"
```

```
# Load
my_sF <- load_shapefile(fl)

## End(Not run)
```

`mapping_fn` *Compute areas of intersection between each election boundary and those in the Census of interest. This is a less refined method than using SA1 centroids.*

Description

At the time of an election, compute how much each electoral division intersects with the divisions in place at the time of the Census. This is to be used in interpolating Census information for electoral divisions in a year that a Census did not occur.

Usage

```
mapping_fn(aec_sF, abs_sF, area_thres = 0.995)
```

Arguments

`aec_sF`	shapefile with boundaries at election time
`abs_sF`	shapefile with boundaries at census time
`area_thres`	threshold for which mapping is sufficient (default is 99.5%)

Value

data frame detailing how much Census divisions intersect with each electoral division at the time of the election.

Examples

```
## Not run:
# Each 2013 electorate boundary's composition in terms of the
# boundaries in place for the 2016 Census
aec_sF_2013 <- loadShapeFile(path_to_aec_shapefile)
abs_sF_2016 <- loadShapeFile(path_to_abs_shapefile)

mapping_df <- mapping_fn(aec_sF = aec_sF_2013, abs_sF = abs_sF_2016, area_thres = 0.995)

## End(Not run)
```

nat_data01 — *Data and centroids corresponding to the Australian Electorates from 2001*

Description

A dataset containing some demographic information for each of the 150 Australian electorates. The data were obtained from the Australian Government, and downloaded from https://data.gov.au/dataset/ds-dga-0b939a62-e53e-4616-add5-77f909b58ddd/details?q=asgc%202001. Must be loaded using the 'nat_data_download' function.

Usage

```
nat_data01
```

Format

A data frame with 150 rows with the following variables:

- id: Numeric identifier for the polygon
- elect_div: Electorate division name
- state: abbreviation of the state name
- long_c: longitude coordinate of electorate (polygon) centroid
- lat_c: latitude coordinate of electorate (polygon) centroid
- x: latitude coordinate for plotting a cartogram
- y: longitude coordinate for plotting a cartogram
- radius: variable used in the construction of cartogram points

nat_data04 — *Data and centroids corresponding to the Australian Electorates from 2004*

Description

A dataset containing some demographic information for each of the 150 Australian electorates. The data were obtained from the Australian Bureau of Statistics, and downloaded from http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/2923.0.30.0012006?OpenDocument. Must be loaded using the 'nat_data_download' function.

Usage

```
nat_data04
```

Format

A data frame with 150 rows with the following variables:

- id: Numeric identifier for the polygon
- elect_div: Electorate division name
- state: abbreviation of the state name
- long_c: longitude coordinate of electorate (polygon) centroid
- lat_c: latitude coordinate of electorate (polygon) centroid
- x: latitude coordinate for plotting a cartogram
- y: longitude coordinate for plotting a cartogram
- radius: variable used in the construction of cartogram points

---

`nat_data07` *Data and centroids corresponding to the Australian Electorates from 2007*

Description

A dataset containing some demographic information for each of the 150 Australian electorates. The data were obtained from the Australian Bureau of Statistics, and downloaded from http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/2923.0.30.0012006?OpenDocument. Must be loaded using the 'nat_data_download' function.

Usage

```
nat_data07
```

Format

A data frame with 150 rows with the following variables:

- id: Numeric identifier for the polygon
- elect_div: Electorate division name
- state: abbreviation of the state name
- long_c: longitude coordinate of electorate (polygon) centroid
- lat_c: latitude coordinate of electorate (polygon) centroid
- x: latitude coordinate for plotting a cartogram
- y: longitude coordinate for plotting a cartogram
- radius: variable used in the construction of cartogram points

nat_data10 — *Data and centroids corresponding to the Australian Electorates from 2010*

Description

A dataset containing some demographic information for each of the 150 Australian electorates. The data were obtained from the Australian Electoral Commission, and downloaded from http://www.aec.gov.au/Electorates/gis/gis_datadownload.htm. Must be loaded using the 'nat_data_download' function.

Usage

```
nat_data10
```

Format

A data frame with 150 rows with the following variables:

- id: Numeric identifier for the polygon
- elect_div: Electorate division name
- state: abbreviation of the state name
- numccds: AEC variable that might be filled with meaning or a description down the road
- area_sqkm: combined square kilometers of each electorate
- long_c: longitude coordinate of electorate (polygon) centroid
- lat_c: latitude coordinate of electorate (polygon) centroid
- x: latitude coordinate for plotting a cartogram
- y: longitude coordinate for plotting a cartogram
- radius: variable used in the construction of cartogram points

nat_data13 — *Data and centroids corresponding to the Australian Electorates from 2013*

Description

A dataset containing some demographic information for each of the 150 Australian electorates. The data were obtained from the Australian Electoral Commission, and downloaded from http://www.aec.gov.au/Electorates/gis/gis_datadownload.htm. Must be loaded using the 'nat_data_download' function.

Usage

```
nat_data13
```

Format

A data frame with 150 rows with the following variables:

- id: Numeric identifier for the polygon
- elect_div: Electorate division name
- state: abbreviation of the state name
- numccds: AEC variable that might be filled with meaning or a description down the road
- area_sqkm: combined square kilometers of each electorate
- long_c: longitude coordinate of electorate (polygon) centroid
- lat_c: latitude coordinate of electorate (polygon) centroid
- x: latitude coordinate for plotting a cartogram
- y: longitude coordinate for plotting a cartogram
- radius: variable used in the construction of cartogram points

---

`nat_data16` *Data and centroids corresponding to the Australian Electorates from 2016*

Description

A dataset containing some demographic information for each of the 150 Australian electorates. The data were obtained from the Australian Electoral Commission, and downloaded from http://www.aec.gov.au/Electorates/gis/gis_datadownload.htm. Must be loaded using the 'nat_data_download' function.

Usage

```
nat_data16
```

Format

A data frame with 150 rows with the following variables:

- id: Numeric identifier for the polygon
- elect_div: Electorate division name
- state: abbreviation of the state name
- numccds: AEC variable that might be filled with meaning or a description down the road
- area_sqkm: combined square kilometers of each electorate
- long_c: longitude coordinate of electorate (polygon) centroid
- lat_c: latitude coordinate of electorate (polygon) centroid
- x: latitude coordinate for plotting a cartogram
- y: longitude coordinate for plotting a cartogram
- radius: variable used in the construction of cartogram points

Examples

```
library(eechidna)
library(tidyverse)
library(ggthemes)
nat_map16 <- nat_map_download(2016)
data(fp16)
winners <- fp16 %>% filter(Elected == "Y")

# Combine Liberal and National parties
winners <- winners %>%
mutate(PartyNm = ifelse(PartyNm %in% c("NATIONAL PARTY", "LIBERAL PARTY"),
"LIBERAL NATIONAL COALITION", PartyNm))

# Join to map
nat_data16 <- nat_data_download(2016)
nat_data16$DivisionNm <- toupper(nat_data16$elect_div)
nat_data16 <- nat_data16 %>% left_join(winners, by = "DivisionNm")
# Plot
partycolours = c("#FF0033", "#000000", "#CC3300", "#0066CC", "#FFFF00", "#009900")

ggplot(data=nat_map16) +
geom_polygon(aes(x=long, y=lat, group=group), fill="grey90", colour="white") +
geom_point(data=nat_data16, aes(x=x, y=y, colour=PartyNm), size=1.5, alpha=0.8) +
scale_colour_manual(name="Political Party", values=partycolours) +
theme_map() + coord_equal() + theme(legend.position="bottom")
```

---

nat_data19 *Data and centroids corresponding to the Australian Electorates from 2019*

Description

A dataset containing some demographic information for each of the 151 Australian electorates. The data were obtained from the Australian Electoral Commission, and downloaded from http://www.aec.gov.au/Electorates/gis/gis_datadownload.htm. Must be loaded using the 'nat_data_download' function.

Usage

```
nat_data19
```

Format

A data frame with 151 rows with the following variables:

- id: Numeric identifier for the polygon
- elect_div: Electorate division name
- state: abbreviation of the state name

- numccds: AEC variable that might be filled with meaning or a description down the road
- area_sqkm: combined square kilometers of each electorate
- long_c: longitude coordinate of electorate (polygon) centroid
- lat_c: latitude coordinate of electorate (polygon) centroid
- x: latitude coordinate for plotting a cartogram
- y: longitude coordinate for plotting a cartogram
- radius: variable used in the construction of cartogram points

Examples

```
library(eechidna)
library(tidyverse)
library(ggthemes)
nat_map19 <- nat_map_download(2019)
data(fp19)
winners <- fp19 %>% filter(Elected == "Y")

# Combine Liberal and National parties
winners <- winners %>%
mutate(PartyNm = ifelse(PartyNm %in% c("NATIONAL PARTY", "LIBERAL PARTY"),
"LIBERAL NATIONAL COALITION", PartyNm))

# Join to map
nat_data19 <- nat_data_download(2019)
nat_data19$DivisionNm <- toupper(nat_data19$elect_div)
nat_data19 <- nat_data19 %>% left_join(winners, by = "DivisionNm")
# Plot
partycolours = c("#FF0033", "#FF7B00", "#000000", "#FFFF00", "#0066CC", "#009900")

ggplot(data=nat_map19) +
geom_polygon(aes(x=long, y=lat, group=group), fill="grey90", colour="white") +
geom_point(data=nat_data19, aes(x=x, y=y, colour=PartyNm), size=1.5, alpha=0.8) +
scale_colour_manual(name="Political Party", values=partycolours) +
theme_map() + coord_equal() + theme(legend.position="bottom")
```

---

nat_data_download *Download DataFrame containing the data associated with Australian federal electorates*

Description

Download DataFrame containing the data associated with Australian federal electorates

Usage

```
nat_data_download(year, ...)
```

Arguments

year	Desired year, must be one of 2001, 2004, 2007, 2010, 2011, 2013, 2016, 2019
...	Additional arguments passed to 'download.file'

Downloads and returns a DataFrame containing the points that outline the polygons for each of the Australian electorates in the desired federal election. This object is obtained using the 'nat_data_download' function. The data were obtained from the Australian Electoral Commission and the Australian Bureau of Statistics.

Value

A DataFrame with data associated with each of the Australian federal electorates

Examples

```
## Not run:
nat_map16 <- nat_map_download(year = 2016)
nat_data16 <- nat_data_download(year = 2016)
# Plot a map of the electorates
library(sp)
plot(sF_16)

## End(Not run)
```

---

nat_map01 *Map of Australian Electorates from 2001*

Description

A dataset containing the map of the all 150 Australian electorates using the 2001 boundaries of the electorates. The data were obtained from the Australian Government, and downloaded from https://data.gov.au/dataset/ds-dga-0b939a62-e53e-4616-add5-77f909b58ddd/details?q=asgc%202001. Must be loaded using the 'nat_map_download' function.

Usage

```
nat_map01
```

Format

A data frame with the following variables:

- id: Numeric identifier for the polygon
- long: longitude coordinate of point in polygon
- lat: latitude coordinate of point in polygon
- order: order for polygon points

- hole: whether polygon has a hole
- piece: piece for polygon
- group: group for polygon
- elect_div: Electoral division name
- state: Abbreviation for state name

`nat_map04` *Map of Australian Electorates from 2004*

Description

A dataset containing the map of the all 150 Australian electorates using the 2004 boundaries of the electorates. The data were obtained from the Australian Bureau of Statistics, and downloaded from http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/2923.0.30.0012006?OpenDocument. Must be loaded using the 'nat_map_download' function.

Usage

```
nat_map04
```

Format

A data frame with the following variables:

- id: Numeric identifier for the polygon
- long: longitude coordinate of point in polygon
- lat: latitude coordinate of point in polygon
- order: order for polygon points
- hole: whether polygon has a hole
- piece: piece for polygon
- group: group for polygon
- elect_div: Electoral division name
- state: Abbreviation for state name

nat_map07 *Map of Australian Electorates from 2007*

Description

A dataset containing the map of the all 150 Australian electorates using the 2007 boundaries of the electorates. The data were obtained from the Australian Electoral Commission, and downloaded from http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/2923.0.30.0012006?OpenDocument. Must be loaded using the 'nat_map_download' function.

Usage

```
nat_map07
```

Format

A data frame with the following variables:

- id: Numeric identifier for the polygon
- long: longitude coordinate of point in polygon
- lat: latitude coordinate of point in polygon
- order: order for polygon points
- hole: whether polygon has a hole
- piece: piece for polygon
- group: group for polygon
- elect_div: Electoral division name
- state: Abbreviation for state name

nat_map10 *Map of Australian Electorates from 2010*

Description

A dataset containing the map of the all 150 Australian electorates using the 2010 boundaries of the electorates. The data were obtained from the Australian Electoral Commission, and downloaded from http://www.aec.gov.au/Electorates/gis/gis_datadownload.htm. Must be loaded using the 'nat_map_download' function.

Usage

```
nat_map10
```

Format

A data frame with the following variables:

- id: Numeric identifier for the polygon
- long: longitude coordinate of point in polygon
- lat: latitude coordinate of point in polygon
- order: order for polygon points
- hole: whether polygon has a hole
- piece: piece for polygon
- group: group for polygon
- elect_div: Electoral division name
- state: Abbreviation for state name

`nat_map13` *Map of Australian Electorates from 2013*

Description

A dataset containing the map of the all 150 Australian electorates using the 2013 boundaries of the electorates. The data were obtained from the Australian Electoral Commission, and downloaded from http://www.aec.gov.au/Electorates/gis/gis_datadownload.htm. Must be loaded using the 'nat_map_download' function.

Usage

```
nat_map13
```

Format

A data frame with the following variables:

- id: Numeric identifier for the polygon
- long: longitude coordinate of point in polygon
- lat: latitude coordinate of point in polygon
- order: order for polygon points
- hole: whether polygon has a hole
- piece: piece for polygon
- group: group for polygon
- elect_div: Electoral division name
- state: Abbreviation for state name

nat_map16 *Map of Australian Electorates from 2016*

Description

A dataset containing the map of the all 150 Australian electorates using the 2016 boundaries of the The data were obtained from the Australian Electoral Commission, and downloaded from http://www.aec.gov.au/Electorates/gis/gis_datadownload.htm. Must be loaded using the 'nat_map_download' function.

Usage

```
nat_map16
```

Format

A data frame with the following variables:

- id: Numeric identifier for the polygon
- long: longitude coordinate of point in polygon
- lat: latitude coordinate of point in polygon
- order: order for polygon points
- hole: whether polygon has a hole
- piece: piece for polygon
- group: group for polygon
- elect_div: Electoral division name
- state: Abbreviation for state name

Examples

```
library(eechidna)
nat_map16 <- nat_map_download(2016)
# choropleth map with Australian Census data
nat_map16$region <- nat_map16$elect_div
data(abs2016)
abs2016$region <- abs2016$DivisionNm
library(ggplot2)
library(ggthemes)
both <- intersect(unique(abs2016$region), unique(nat_map16$region))
ggplot(aes(map_id=region), data=subset(abs2016, region %in% both)) +
  geom_map(aes(fill=MedianPersonalIncome), map=subset(nat_map16, region %in% both)) +
  expand_limits(x=nat_map16$long, y=nat_map16$lat) +
  theme_map()
```

nat_map19 *Map of Australian Electorates from 2019*

Description

A dataset containing the map of the all 150 Australian electorates using the 2019 boundaries of the The data were obtained from the Australian Electoral Commission, and downloaded from http://www.aec.gov.au/Electorates/gis/gis_datadownload.htm. Must be loaded using the 'nat_map_download' function.

Usage

```
nat_map19
```

Format

A data frame with the following variables:

- id: Numeric identifier for the polygon
- long: longitude coordinate of point in polygon
- lat: latitude coordinate of point in polygon
- order: order for polygon points
- hole: whether polygon has a hole
- piece: piece for polygon
- group: group for polygon
- elect_div: Electoral division name
- state: Abbreviation for state name

Examples

```
library(eechidna)
nat_map19 <- nat_map_download(2019)
# choropleth map with Australian Census data
nat_map19$region <- nat_map19$elect_div
data(abs2019)
abs2019$region <- abs2019$DivisionNm
library(ggplot2)
library(ggthemes)
both <- intersect(unique(abs2019$region), unique(nat_map19$region))
ggplot(aes(map_id=region), data=subset(abs2019, region %in% both)) +
  geom_map(aes(fill=MedianPersonalIncome), map=subset(nat_map19, region %in% both)) +
  expand_limits(x=nat_map19$long, y=nat_map19$lat) +
  theme_map()
```

nat_map_download — *Download DataFrame containing the polygons of Australian federal electorates*

Description

Download DataFrame containing the polygons of Australian federal electorates

Usage

```
nat_map_download(year, ...)
```

Arguments

year	Desired year, must be one of 2001, 2004, 2007, 2010, 2011, 2013, 2016, 2019
...	Additional arguments passed to 'download.file'

Downloads and returns a DataFrame containing the points that outline the polygons for each of the Australian electorates in the desired federal election. This object is obtained using the 'nat_map_download' function. The data were obtained from the Australian Electoral Commission and the Australian Bureau of Statistics.

Value

A DataFrame consisting of points outlining each of the Australian federal electorates

Examples

```
## Not run:
nat_map16 <- nat_map_download(year = 2016)
nat_data16 <- nat_data_download(year = 2016)
# Plot a map of the electorates
library(sp)
plot(sF_16)

## End(Not run)
```

sF_download — *Download SpatialPolygonsDataFrame containing polygons of Australian federal electorates*

Description

Download SpatialPolygonsDataFrame containing polygons of Australian federal electorates

Usage

```
sF_download(year, ...)
```

Arguments

year	Desired year, must be one of 2001, 2004, 2007, 2010, 2011, 2013, 2016, 2019
...	Additional arguments passed to 'download.file'

Downloads and returns a large SpatialPolygonsDataFrame containing the polygons and associated data for each of the Australian electorates in the desired federal election. This object is obtained using the 'sF_download' function. The data were obtained from the Australian Electoral Commission and the Australian Bureau of Statistics.

Value

A SpatialPolygonsDataFrame containing polygons of the Australian federal electorates

Examples

```
## Not run:
sF_16 <- sF_download(year = 2016)
# Plot a map of the electorates
library(sp)
plot(sF_16)

## End(Not run)
```

---

tcp01 *2001 Australian Federal election data: Two candidate preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two candidate preferred vote counts, and other results for the House of Representatives from the 2001 Australian federal election. Includes the count of votes for the leading two candidates in the electorate after distribution of preferences. The data were obtained from the Australian Electoral Commission, and downloaded from https://www.aec.gov.au/About_AEC/Publications/statistics/files/aec-2001-election-statistics.zip.

Usage

```
tcp01
```

Format

A data frame with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- StateAb: Abbreviation for state name
- DivisionNm: Electoral division name
- Surname: Candidate surname
- GivenNm: Candidate given name
- Elected: Whether the candidate was elected (Y/N)
- Percent: Percentage of ordinary votes cast for the candidate
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Swing: Percentage point change in ordinary votes for the party from the previous election

---

tcp04 — *2004 Australian Federal election data: Two candidate preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two candidate preferred vote counts, and other results for the House of Representatives from the 2004 Australian federal election. Includes the count of votes for the leading two candidates in the electorate after distribution of preferences. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/12246/results/HouseDownloadsMenu-12246-csv.htm and http://www.aec.gov.au/elections/federal_elections/2004/downloads.htm.

Usage

```
tcp04
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname

- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- OrdinaryVotes: Number of ordinary votes cast for the candidate
- Percent: Percentage of ordinary votes cast for the candidate

---

`tcp07` *2007 Australian Federal election data: Two candidate preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two candidate preferred vote counts, and other results for the House of Representatives from the 2007 Australian federal election. Includes the count of votes for the leading two candidates in the electorate after distribution of preferences. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/13745/Website/HouseDownloadsMenu-13745-csv.htm and http://www.aec.gov.au/elections/federal_elections/2007/downloads.htm.

Usage

```
tcp07
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- OrdinaryVotes: Number of ordinary votes cast for the candidate
- Percent: Percentage of ordinary votes cast for the candidate

`tcp10` *2010 Australian Federal election data: Two candidate preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two candidate preferred vote counts, and other results for the House of Representatives from the 2010 Australian federal election. Includes the count of votes for the leading two candidates in the electorate after distribution of preferences. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/15508/Website/HouseDownloadsMenu-15508-csv.htm and http://www.aec.gov.au/elections/federal_elections/2010/downloads.htm.

Usage

```
tcp10
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- OrdinaryVotes: Number of ordinary votes cast for the candidate
- Percent: Percentage of ordinary votes cast for the candidate

tcp13 *2013 Australian Federal election data: Two candidate preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two candidate preferred vote counts, and other results for the House of Representatives from the 2013 Australian federal election. Includes the count of votes for the leading two candidates in the electorate after distribution of preferences. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/17496/Website/HouseDownloadsMenu-17496-csv.htm and http://www.aec.gov.au/elections/federal_elections/2013/downloads.htm.

Usage

```
tcp13
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- OrdinaryVotes: Number of ordinary votes cast for the candidate
- Percent: Percentage of ordinary votes cast for the candidate

tcp16 *2016 Australian Federal election data: Two candidate preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two candidate preferred vote counts, and other results for the House of Representatives from the 2016 Australian federal election. Includes the count of votes for the leading two candidates in the electorate after distribution of preferences. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/20499/Website/HouseDownloadsMenu-20499-csv.htm and http://www.aec.gov.au/elections/federal_elections/2016/downloads.htm.

Usage

```
tcp16
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- OrdinaryVotes: Number of ordinary votes cast for the candidate
- Percent: Percentage of ordinary votes cast for the candidate

tcp19 *2019 Australian Federal election data: Two candidate preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two candidate preferred vote counts, and other results for the House of Representatives from the 2019 Australian federal election. Includes the count of votes for the leading two candidates in the electorate after distribution of preferences. The data were obtained from the Australian Electoral Commission, and downloaded from https://results.aec.gov.au/24310/Website/HouseDownloadsMenu-24310-Csv.htm.

Usage

```
tcp19
```

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- BallotPosition: Candidate's position on the ballot
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- Elected: Whether the candidate was elected (Y/N)
- HistoricElected: Whether the candidate is the incumbent member
- OrdinaryVotes: Number of ordinary votes cast for the candidate
- Percent: Percentage of ordinary votes cast for the candidate

tpp01 *2001 Australian Federal election data: Two party preferred votes for candidates (House of Representatives) in each electorate. where Labor and Liberal parties were the two most popular parties.*

Description

A dataset containing two party preferred vote counts, winning candidate names, and other results for the House of Representatives from the 2001 Australian federal election. Includes the count of votes for the Australian Labor Party and the count of votes for the Liberal-National Coalition for each electorate. The data were obtained from the Australian Electoral Commission, and downloaded from https://www.aec.gov.au/About_AEC/Publications/statistics/files/aec-2001-election-statistics.zip.

Usage

```
tpp01
```

Format

A data frame with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- StateAb: Abbreviation for state name
- LNP_Votes: Count of two party preferred vote in favour of the Liberal National coalition
- LNP_Percent: Percentage of two party preferred vote in favour of the Liberal National coalition
- ALP_Votes: Count of two party preferred vote in favour of the Labor party
- ALP_Percent: Percentage of two party preferred vote in favour of the Labor party
- TotalVotes: Total number of votes cast
- Swing: Percentage point change in two party preferred vote from the previous election

tpp04 *2004 Australian Federal election data: Two party preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two party preferred vote counts, winning candidate names, and other results for the House of Representatives from the 2004 Australian federal election. Includes the count of votes for the Australian Labor Party and the count of votes for the Liberal-National Coalition for each electorate. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/12246/results/HouseDownloadsMenu-12246-csv.htm and http://www.aec.gov.au/elections/federal_elections/2004/downloads.htm.

Usage

```
tpp04
```

Format

A data frame with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- StateAb: Abbreviation for state name
- LNP_Votes: Count of two party preferred vote in favour of the Liberal National coalition
- LNP_Percent: Percentage of two party preferred vote in favour of the Liberal National coalition
- ALP_Votes: Count of two party preferred vote in favour of the Labor party
- ALP_Percent: Percentage of two party preferred vote in favour of the Labor party
- TotalVotes: Total number of votes cast
- Swing: Percentage point change in two party preferred vote from the previous election

---

tpp07 *2007 Australian Federal election data: Two party preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two party preferred vote counts, winning candidate names, and other results for the House of Representatives from the 2007 Australian federal election. Includes the count of votes for the Australian Labor Party and the count of votes for the Liberal-National Coalition for each electorate. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/13745/Website/HouseDownloadsMenu-13745-csv.htm and http://www.aec.gov.au/elections/federal_elections/2007/downloads.htm.

Usage

```
tpp07
```

Format

A data frame with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- StateAb: Abbreviation for state name

- LNP_Votes: Count of two party preferred vote in favour of the Liberal National coalition
- LNP_Percent: Percentage of two party preferred vote in favour of the Liberal National coalition
- ALP_Votes: Count of two party preferred vote in favour of the Labor party
- ALP_Percent: Percentage of two party preferred vote in favour of the Labor party
- TotalVotes: Total number of votes cast
- Swing: Percentage point change in two party preferred vote from the previous election

---

`tpp10` *2010 Australian Federal election data: Two party preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two party preferred vote counts, winning candidate names, and other results for the House of Representatives from the 2010 Australian federal election. Includes the count of votes for the Australian Labor Party and the count of votes for the Liberal-National Coalition for each electorate. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/15508/Website/HouseDownloadsMenu-15508-csv.htm and http://www.aec.gov.au/elections/federal_elections/2010/downloads.htm.

Usage

```
tpp10
```

Format

A data frame with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- StateAb: Abbreviation for state name
- LNP_Votes: Count of two party preferred vote in favour of the Liberal National coalition
- LNP_Percent: Percentage of two party preferred vote in favour of the Liberal National coalition
- ALP_Votes: Count of two party preferred vote in favour of the Labor party
- ALP_Percent: Percentage of two party preferred vote in favour of the Labor party
- TotalVotes: Total number of votes cast
- Swing: Percentage point change in two party preferred vote from the previous election

tpp13 — *2013 Australian Federal election data: Two party preferred votes for candidates (House of Representatives) in each electorate.*

Description

A dataset containing two party preferred vote counts, winning candidate names, and other results for the House of Representatives from the 2013 Australian federal election. Includes the count of votes for the Australian Labor Party and the count of votes for the Liberal-National Coalition for each electorate. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/17496/Website/HouseDownloadsMenu-17496-csv.htm and http://www.aec.gov.au/elections/federal_elections/2013/downloads.htm.

Usage

```
tpp13
```

Format

A data frame with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- StateAb: Abbreviation for state name
- LNP_Votes: Count of two party preferred vote in favour of the Liberal National coalition
- LNP_Percent: Percentage of two party preferred vote in favour of the Liberal National coalition
- ALP_Votes: Count of two party preferred vote in favour of the Labor party
- ALP_Percent: Percentage of two party preferred vote in favour of the Labor party
- TotalVotes: Total number of votes cast
- Swing: Percentage point change in two party preferred vote from the previous election

tpp16 — *2016 Australian Federal election data: Two party preferred votes for candidates (House of Representative) in each electorate.*

Description

A dataset containing two party preferred vote counts, winning candidate names, and other results for the House of Representatives from the 2016 Australian federal election. Includes the count of votes for the Australian Labor Party and the count of votes for the Liberal-National Coalition for each electorate. The data were obtained from the Australian Electoral Commission, and downloaded from http://results.aec.gov.au/20499/Website/HouseDownloadsMenu-20499-csv.htm and http://www.aec.gov.au/elections/federal_elections/2016/downloads.htm.

Usage

```
tpp16
```

Format

A data frame with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- StateAb: Abbreviation for state name
- LNP_Votes: Count of two party preferred vote in favour of the Liberal National coalition
- LNP_Percent: Percentage of two party preferred vote in favour of the Liberal National coalition
- ALP_Votes: Count of two party preferred vote in favour of the Labor party
- ALP_Percent: Percentage of two party preferred vote in favour of the Labor party
- TotalVotes: Total number of votes cast
- Swing: Percentage point change in two party preferred vote from the previous election

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tpp19 *2019 Australian Federal election data: Two party preferred votes for candidates (House of Representative) in each electorate.*

Description

A dataset containing two party preferred vote counts, winning candidate names, and other results for the House of Representatives from the 2019 Australian federal election. Includes the count of votes for the Australian Labor Party and the count of votes for the Liberal-National Coalition for each electorate. The data were obtained from the Australian Electoral Commission, and downloaded from https://results.aec.gov.au/24310/Website/HouseDownloadsMenu-24310-Csv.htm.

Usage

```
tpp19
```

Format

A data frame with the following variables:

- UniqueID: Numeric identifier that links the electoral division with Census and other election datasets.
- DivisionNm: Electoral division name
- StateAb: Abbreviation for state name
- LNP_Votes: Count of two party preferred vote in favour of the Liberal National coalition

- LNP_Percent: Percentage of two party preferred vote in favour of the Liberal National coalition
- ALP_Votes: Count of two party preferred vote in favour of the Labor party
- ALP_Percent: Percentage of two party preferred vote in favour of the Labor party
- TotalVotes: Total number of votes cast
- Swing: Percentage point change in two party preferred vote from the previous election

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`twocand_pollingbooth_download`

Download two candidate preference voting data from each polling booth, from the five Australian Federal elections between 2004 and 2016.

Description

Download two candidate preference voting data from each polling booth, from the five Australian Federal elections between 2004 and 2016.

Usage

```
twocand_pollingbooth_download(...)
```

Arguments

...	Additional arguments passed to 'download.file'

Downloads and returns the two candidate preferred votes for candidates in the House of Representatives, for each polling both, in the five Australian Federal elections between 2004 and 2016.

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- DivisionID: Electoral division ID
- DivisionNm: Electoral division name
- PollingPlaceID: Polling place ID
- PollingPlace: Polling place name
- CandidateID: Candidate ID
- Surname: Candidate surname
- GivenNm: Candidate given name
- BallotPosition: Candidate's position on the ballot
- Elected: Whether the candidate was elected (Y/N)

- HistoricElected: Whether the candidate is the incumbent member
- PartyAb: Abbreviation for political party name
- PartyNm: Political party name
- OrdinaryVotes: Number of ordinary votes cast at the polling place for the candidate
- Swing: Percentage point change in ordinary votes for the party from the previous election
- PremisesPostCode: Post code of polling booth
- Latitude: Coordinates
- Longitude: Coordinates
- year: Election year

Value

A data frame containing two candidate preference votes

A dataset containing two candidate preferred vote counts, polling place locations, and other results for the House of Representatives from each of the 2004, 2007, 2010, 2013 and 2016 Australian federal elections. Includes the count of votes for the leading two candidates in the electorate after distribution of preferences for each polling place. Note that 2001 two candidate preferred vote is not available in this package. This data set is obtained using the 'twocand_pollingbooth_download' function. The data were obtained from the Australian Electoral Commission,

Examples

```
## Not run:
tcp_pp <- twocand_pollingbooth_download()
library(dplyr)
tcp_pp %>% filter(year == 2016) %>% arrange(-OrdinaryVotes) %>% head

## End(Not run)
```

`twoparty_pollingbooth_download` *Download two party preference voting data from each polling booth, from the seven Australian Federal elections between 2001 and 2016.*

Description

Download two party preference voting data from each polling booth, from the seven Australian Federal elections between 2001 and 2016.

Usage

```
twoparty_pollingbooth_download(...)
```

Arguments

...	Additional arguments passed to 'download.file'

Downloads and returns the two party preferred votes for candidates in the House of Representatives, for each polling both, in the six Australian Federal elections between 2001 and 2016.

Format

A data frame with the following variables:

- StateAb: Abbreviation for state name
- DivisionID: Electoral division ID
- DivisionNm: Electoral division name
- PollingPlaceID: Polling place ID
- PollingPlace: Polling place name
- LNP_Votes: Count of two party preferred vote in favour of the Liberal National coalition
- LNP_Percent: Percentage of two party preferred vote in favour of the Liberal National coalition
- ALP_Votes: Count of two party preferred vote in favour of the Labor party
- ALP_Percent: Percentage of two party preferred vote in favour of the Labor party
- TotalVotes: Total number of votes cast
- Swing: Percentage point change in two party preferred vote from the previous election
- PremisesPostCode: Post code of polling booth
- Latitude: Coordinates
- Longitude: Coordinates
- year: Election year

Value

A data frame containing two party preference votes

A dataset containing two party preferred vote counts, winning candidate names, polling place locations, and other results for the House of Representatives from each of the 2001, 2004, 2007, 2010, 2013 and 2016 Australian federal elections. Includes the count of votes for the Australian Labor Party and the count of votes for the Liberal-National Coalition for each polling place. This data set is obtained using the 'twoparty_pollingbooth_download' function. The data were obtained from the Australian Electoral Commission.

Examples

```
## Not run:
tpp_pp <- twoparty_pollingbooth_download()
library(dplyr)
tpp_pp %>% filter(year == 2016) %>% arrange(-LNP_Percent) %>% head

## End(Not run)
```

`weighted_avg_census` *Function to compute weighted average of Census information using imputed populations as weights.*

Description

This is a less refined method than using SA1 centroids, because it uses Census data aggregated at Census division level.

Usage

```
weighted_avg_census(mapping_df, abs_df)
```

Arguments

`mapping_df`	data frame detailing how much Census divisions intersect with each electoral division at the time of the election.
`abs_df`	data frame holding Census information from Census year

Value

data frame with imputed Census data for electoral boundaries at the time of the Census

Examples

```
## Not run:
data("abs2016")

# Each 2013 electorate boundary's composition in terms of the
# boundaries in place for the 2016 Census
aec_sF_2013 <- loadShapeFile(path_to_aec_shapefile)
abs_sF_2016 <- loadShapeFile(path_to_abs_shapefile)
mapping_2016 <- mapping_fn(aec_sF = aec_sF_2013, abs_sF = abs_sF_2016)

# Estimate 2016 Census data for the 2013 electorates
imputed_data_2016 <- weighted_avg_census(mapping_df = mapping_2016, abs_df = abs2016)

## End(Not run)
```

`weighted_avg_census_sa1` *Function to compute weighted average of Census information using imputed populations as weights*

Description

Function to compute weighted average of Census information using imputed populations as weights

Usage

```
weighted_avg_census_sa1(mapping_df, abs_df)
```

Arguments

`mapping_df`	data frame detailing how much Census divisions intersect with each electoral division at the time of the election.
`abs_df`	data frame holding Census information from Census year

Value

data frame with imputed Census data for electoral boundaries at the time of the Census

Examples

```
## Not run:
# Each 2013 electorate boundary's characteristics as at the time of the 2016 Census
mapping_c16_e13 <- allocate_electorate(centroids_ls = centroids_sa1_2016, electorates_sf = sF_13,
census_year = "2016", election_year = "2013")

# Estimate 2016 Census data for the 2013 electorates
imputed_data_2016 <- weighted_avg_census_sa1(mapping_df = mapping_2016, abs_df = abs2016_cd)

## End(Not run)
```

Index