Package 'fds'

October 26, 2026

Type Package

Title Functional Data Sets

Version 2.0

Date 2026-10-26

Depends R (>= 3.5.0), rainbow

Imports httr, utils

LazyLoad yes

LazyData yes

LazyDataCompression xz

ByteCompile TRUE

Maintainer Han Lin Shang <hanlin.shang@mq.edu.au>

Description Functional data sets, covering demography, chemometrics, climate, electricity consumption, and finance.

License GPL (>= 2)

NeedsCompilation no

Author Han Lin Shang [aut, cre, cph] (ORCID:
<https://orcid.org/0000-0003-1769-6430>),
Rob J. Hyndman [aut] (ORCID: <https://orcid.org/0000-0002-2140-5352>)

Repository CRAN

Date/Publication 2026-10-26 17:00:02 UTC

Contents

fds-package 2
Ausmortality 3
Biscuit 5
Cancerrate 6
ECBYieldcurve 7
Electricityconsumption 8
Electricitydemand 9

Fat 10
FedYieldcurve 11
hmdcountry 11
hmdstatistic 12
Moisture 13
Octane 14
Phoneme 15
Pigweight 16
read.hmd 17
read.jpn 18
read.jpn_death 19
Satellite 20
SAtemp 21
SOI 22
Spanishmigration 22
Yieldcurve 23

Index **25**

`fds-package` *Functional data sets*

Description

This package contains a collection of functional time series, sliced functional time series, and functional data sets. A functional time series is a special type of functional data observed over time. A sliced functional time series is obtained by dividing a univariate time series into consecutive segments (e.g., days), each treated as a curve.

Author(s)

Han Lin Shang and Rob J Hyndman

Maintainer: Han Lin Shang <hanlin.shang@mq.edu.au>

References

R. J. Hyndman and H. L. Shang (2010) "Rainbow plots, bagplots, and boxplots for functional data", *Journal of Computational and Graphical Statistics*, **19**(1), 29-45.

R. J. Hyndman and H. L. Shang (2009) "Forecasting functional time series (with discussion)", *Journal of the Korean Statistical Society*, **38**(3), 199-221.

H. L. Shang and R. J. Hyndman (2011) "Nonparametric time series forecasting with dynamic updating", *Mathematics and Computers in Simulation*, **81**(7), 1310-1324.

`Ausmortality` *Australia and Australian state mortality rates*

Description

Age-specific mortality rates for Australia and Australian states.

Usage

```
data(ausmale)
data(ausfemale)
data(austotal)
data(nswmale)
data(nswfemale)
data(nswtotal)
data(vicmale)
data(vicfemale)
data(victotal)
data(qldmale)
data(qldfemale)
data(qldtotal)
data(samale)
data(safemale)
data(satotal)
data(wamale)
data(wafemale)
data(watotal)
data(ntmale)
data(ntfemale)
data(ntotal)
data(actmale)
data(actfemale)
data(actotal)
data(tasmale)
data(tasfemale)
data(tastotal)
```

Format

An object of class `fts`.

Details

The following datasets are included:

`ausmale`: Australian male log mortality rates (1901-2003).

`ausfemale`: Australian female log mortality rates (1901-2003).

austotal: Australian total log mortality rates (1901-2003).

nswmale: New South Wales male log mortality rates (1901-2003).

nswfemale: New South Wales female log mortality rates (1901-2003).

nswtotal: New South Wales total log mortality rates (1901-2003).

vicmale: Victoria male log mortality rates (1901-2003).

vicfemale: Victoria female log mortality rates (1901-2003).

victotal: Victoria total log mortality rates (1901-2003).

qldmale: Queensland male log mortality rates (1901-2003).

qldfemale: Queensland female log mortality rates (1901-2003).

qldtotal: Queensland total log mortality rates (1901-2003).

samale: South Australia male log mortality rates (1901-2003).

safemale: South Australia female log mortality rates (1901-2003).

satotal: South Australia total log mortality rates (1901-2003).

wamale: Western Australia male log mortality rates (1901-2003).

wafemale: Western Australia female log mortality rates (1901-2003).

watotal: Western Australia total log mortality rates (1901-2003).

ntmale: Northern Territory male mortality rates (1901-2003).

ntfemale: Northern Territory female mortality rates (1901-2003).

ntotal: Northern Territory total mortality rates (1901-2003).

actmale: Australian Capital Territory male mortality rates (1901-2003).

actfemale: Australian Capital Territory female mortality rates (1901-2003).

actotal: Australian Capital Territory total mortality rates (1901-2003).

tasmale: Tasmania male mortality rates (1901-2003).

tasfemale: Tasmania female mortality rates (1901-2003).

tastotal: Tasmania total mortality rates (1901-2003).

Mortality rates are in logarithmic form for Australia, New South Wales, Victoria, Queensland, South Australia, and Western Australia.

Mortality rates are given without log transformation for the Northern Territory, the Australian Capital Territory, and Tasmania, because these three regions have either missing data or zero mortality rates.

All data are from v3.2b of the Australian Demographic Data Bank released on 10 February 2005.

Author(s)

Rob J Hyndman

Source

The Australian Demographic Data Bank (courtesy of Len Smith).

References

H. Booth and R. J. Hyndman and L. Tickle and P. De Jong (2006) "Lee-Carter mortality forecasting: A multi-country comparison of variants and extensions", *Demographic Research*, **15**, 289-310.

R. J. Hyndman and M. S. Ullah (2007) "Robust forecasting of mortality and fertility rates: A functional data approach", *Computational Statistics and Data Analysis*, **51**(10), 4942-4956.

R. J. Hyndman and H. Booth (2008) "Stochastic population forecasts using functional data models for mortality, fertility and migration", *International Journal of Forecasting*, **24**(3), 323-342.

R. J. Hyndman and H. L. Shang (2009) "Forecasting functional time series (with discussion)", *Journal of the Korean Statistical Society*, **38**(3), 199-221.

J-M. Chiou and H-G. M\"uller (2009) "Modeling hazard rates as functional data for the analysis of cohort lifetables and mortality forecasting", *Journal of the American Statistical Association*, **104**(486), 572-585.

Examples

```
plot(victotal)
```

`Biscuit` *Biscuit dough piece data*

Description

The experiment involved varying the composition of biscuit dough pieces. Two sets of dough pieces were measured: a calibration set and a prediction set. They were created and measured as two distinct sets, on separate occasions, and do not result from a random (or any other) split of a larger set.

Usage

```
data(labp)
data(labc)
data(nirp)
data(nirc)
```

Format

`nirp` and `nirc` are objects of class `fds`.

`labp` and `labc` are objects of class `matrix`.

Details

The data `labc` (`c` stands for calibration) and `labp` (`p` stands for prediction) contain the reference data on the composition of the doughs.

The data `nirc` and `nirp` contain 700-point near-infrared reflectance (NIR) spectra for the same doughs. The spectral range is 1100-2498 nm in steps of 2 nm.

The data `labc` is a (4 x 40) matrix, the rows being fat, sucrose, flour, and water, all in percent. The percentages do not quite add up to 100, since there are other minor ingredients present, but they add up to nearly 100 percent.

According to Brown et al. (2001), observation 23 in the calibration set is as an outlier.

Sample 21 of the prediction set is also an outlier.

Note

We thank Professor Marina Vannucci for the permission to redistribute this data set.

References

P. J. Brown and T. Fearn and M. Vannucci (2001) "Bayesian wavelet regression on curves with applications to a spectroscopic calibration problem", *Journal of the American Statistical Association*, **96**(454), 398-408.

Examples

```
plot(nirp)
plot(nirc)
```

`Cancerrate` *Breast cancer rates*

Description

Age-specific breast cancer rates for Australian females with 9 age groups (45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89) from 1921 to 2001.

Usage

```
data(Cancerrate)
```

Format

An object of class `fts`.

Source

Australian Institute of Health and Welfare (AIHW) website at https://www.aihw.gov.au/reports-data/health-conditions-disability-deaths/cancer/data.

References

B. Erbas and R. J. Hyndman and D. Gertig (2007) "Forecasting age-specific breast cancer mortality using functional data models", *Statistics in Medicine*, **26**(2), 458-470.

R. J. Hyndman and M. S. Ullah (2007) "Robust forecasting of mortality and fertility rates: A functional data approach", *Computational Statistics and Data Analysis*, **51**(10), 4942-4956.

Examples

```
plot(Cancerrate)
```

ECBYieldcurve *Euro area yield curve spot rates*

Description

Provided by the European Central Bank, this data set contains daily yield curve spot rates from 29 December 2006 to 24 July 2009 for nominal AAA-rated Euro area central government bonds, with maturities of 3 and 6 months and 1 to 30 years.

Usage

```
data(ECBYieldcurve)
```

Format

An object of class `fts`.

Note

We thank Mr. Sergio S. Guirreri for the permission to redistribute this data set.

Source

European Central Bank: https://www.ecb.europa.eu/stats/financial_markets_and_interest_rates/euro_area_yield_curves/html/index.en.html.

Examples

```
plot(ECBYieldcurve)
```

`Electricityconsumption`

Electricity consumption time series

Description

This set of time series contains monthly US electricity consumption by the residential and commercial sectors from January 1973 to December 2000 (336 months). This dataset is part of the original one, which can be found at https://www.eia.gov/totalenergy/data/browser/csv.php?tbl=T07.06.

Usage

```
data(Electricityconsumption)
```

Format

An object of class `sfts`.

Details

We eliminated the heteroscedasticity and the linear trend by differencing the log-transformed data.

Note

We thank Professor Frederic Ferraty for the permission to redistribute this dataset.

Source

NonParametric Functional Data Analysis website.

References

F. Ferraty and A. Rabhi and P. Vieu (2005) "Conditional quantiles for dependent functional data with application to the climate El Niño phenomenon", *Sankhya: The Indian Journal of Statistics*, **67**, 378-398.

F. Ferraty and P. Vieu (2006) *Nonparametric functional data analysis*, New York: Springer.

Examples

```
plot(Electricityconsumption)
```

`Electricitydemand` *Electricity demand in Adelaide*

Description

These data sets consist of half-hourly electricity demand from Sunday to Saturday in Adelaide between 6 July, 1997 and 31 March, 2007.

Usage

```
data(mondaydemand)
data(tuesdaydemand)
data(wednesdaydemand)
data(thursdaydemand)
data(fridaydemand)
data(saturdaydemand)
data(sundaydemand)
data(SAelectdemand)
```

Format

An object of class `sfts`.

Details

In Adelaide, the electricity demand in summer is very volatile and highly dependent on the associated temperatures. Analyses were performed to test whether or not, under different temperature scenarios, there will be enough capacity to satisfy the electricity demand.

References

L. Magnano and J. Boland and R. J. Hyndman (2008) "Generation of synthetic sequences of half-hourly temperature", *Environmetrics*, **19**(8), 818-835.

Examples

```
plot(mondaydemand)
plot(tuesdaydemand)
plot(wednesdaydemand)
plot(thursdaydemand)
plot(fridaydemand)
plot(saturdaydemand)
plot(sundaydemand)
plot(SAelectdemand)
```

Fat *Fat content spectrometric data*

Description

This data set is a part of the original data set, which can be found at https://lib.stat.cmu.edu/datasets/tecator.

Usage

```
data(Fatspectrum)
data(Fatvalues)
```

Format

Fatspectrum is an object of class fds.

Fatvalues is a numeric object.

Details

For each meat sample, we observe one spectrometric curve which corresponds to the absorbance measured at 100 wavelengths (from 852 to 1050 nm in steps of 2 nm). For each measurement, its fat content was determined by analytical chemistry.

Note

We thank Professor Frederic Ferraty for permission to redistribute this data set.

Source

NonParametric Functional Data Analysis website.

F. Ferraty and P. Vieu (2006) *Nonparametric functional data analysis*, New York: Springer.

References

C. Goutis (1998) "Second-derivative functional regression with applications to near infra-red spectroscopy", *Journal of the Royal Statistical Society: Series B*, **60**(1), 103-114.

F. Ferraty and P. Vieu (2002) "The functional nonparametric model and application to spectrometric data", *Computational Statistics*, **17**(4), 545-564.

F. Ferraty and P. Vieu (2003) "Curve discrimination: A nonparametric functional approach", *Computational Statistics and Data Analysis*, **44**(1-2), 161-173.

F. Ferraty and P. Vieu (2003) "Functional nonparametric statistics: A double infinite dimensional framework", *Recent advances and trends in nonparametric statistics*, eds M. G. Akritas and D. N. Politis, Amsterdam, The Netherlands, 61-76.

F. Rossi and N. Delannay and B. Conan-Guez and M. Verleysen (2005) "Representation of functional data in neural networks", *Neurocomputing*, **64**, 183-210.

H. Matsui and Y. Araki and S. Konishi (2008) "Multivariate regression modeling for functional data", *Journal of Data Science*, **6**, 313-331.

Examples

```
plot(Fatspectrum)
```

`FedYieldcurve` *Federal Reserve interest rates*

Description

This data set contains monthly interest rates of the Federal Reserve from January 1982 to June 2009.

Usage

```
data(FedYieldcurve)
```

Format

An object of class `fts`.

Note

We thank Mr. Sergio S. Guirreri for the permission to redistribute this data set.

Source

Board of Governors of the Federal Reserve System at https://www.federalreserve.gov/.

Examples

```
plot(FedYieldcurve)
```

`hmdcountry` *Function to read a bundle of data sets from the Human Mortality Database*

Description

This function returns a list of relevant demographic data currently available in the HMD, related to a specified country.

Usage

```
hmdcountry(Country, sex, username, password)
```

Arguments

Country	A specified country.
sex	Possible options are "Male", "Female", "Total".
username	Authenticate username.
password	Authenticate password.

Details

In order to read the data sets, users are required to create an account via the HMD website (https://www.mortality.org/), and obtain a valid username and password.

Value

List of objects of class fts.

Author(s)

Han Lin Shang and Rob J Hyndman

See Also

read.hmd, hmdstatistic

---

hmdstatistic *Function to read a bundle of data sets from the Human Mortality Database*

Description

This function returns a list of all the countries currently available in the HMD, related to a specified data type.

Usage

```
hmdstatistic(sex, type = c("birth count", "death count", "population", "exposure",
 "mortality rate", "life expectancy"), username, password)
```

Arguments

sex	Possible options are "Male", "Female", "Total".
type	Type of data.
username	Authenticate username.
password	Authenticate password.

Details

In order to read the data sets, users are required to create an account via the HMD website (https://www.mortality.org/) and obtain a valid username and password.

Value

List of objects of class `fts`.

Author(s)

Han Lin Shang and Rob J Hyndman

See Also

`read.hmd`, `hmdcountry`

Moisture *Moisture content spectrometric data*

Description

This data set consists of near-infrared reflectance spectra of 100 wheat samples, measured in 2 nm intervals from 1100 to 2500 nm, and an associated response variable, the samples' moisture content.

Usage

```
data(Moisturespectrum)
data(Moisturevalues)
```

Format

Moisturespectrum is an object of class `fds`.

Moisturevalues is a numeric object.

Note

We thank Professor John Kalivas for the permission to redistribute this data set.

References

J. H. Kalivas (1997) "Two data sets of near infrared spectra", *Chemometrics and Intelligent Laboratory Systems*, **37**(2), 255-259.

P. Reiss and T. Ogden (2007) "Functional principal component regression and functional partial least squares", *Journal of the American Statistical Association*, **102**(479), 984-996.

P. Reiss and T. Ogden (2009) "Smoothing parameter selection for a class of semiparametric linear models", *Journal of the Royal Statistical Society: Series B*, **71**(2), 505-523.

Examples

```
plot(Moisturespectrum)
```

`Octane` *Octane content spectrometric data*

Description

This data set comprises spectra from 60 gasoline samples, measured in 2 nm intervals from 900 to 1700 nm. The response variable is the octane number of each sample.

Usage

```
data(Octanespectrum)
data(Octanevalues)
```

Format

Octanespectrum is an object of class `fds`.

Octanevalues is a numeric object.

Note

We thank Professor John Kalivas for the permission to redistribute this data set.

References

J. H. Kalivas (1997) "Two data sets of near infrared spectra", *Chemometrics and Intelligent Laboratory Systems*, **37**(2), 255-259.

P. T. Reiss and R. T. Ogden (2009) "Smoothing parameter selection for a class of semiparametric linear models", *Journal of the Royal Statistical Society: Series B*, **71**(2), 505-523.

Examples

```
plot(Octanespectrum)
```

Phoneme *Phoneme data*

Description

This data set was formed by selecting five phonemes for classification based on digitized speech. There are $n = 2000$ pairs $(x_i, y_i)_{i=1,\ldots,n}$, where x_i corresponds to the discretized log-periodograms while y_i gives the class membership (five phonemes: aa, ao, dcl, iy, sh).

Usage

```
data(aa)
data(ao)
data(dcl)
data(iy)
data(sh)
```

Format

Each is an object of class `fds`.

Details

The phonemes are transcribed as follows: "sh" as in "she", "dcl" as in "dark", "iy" as the vowel in "she", "aa" as the vowel in "dark", and "ao" as the first vowel in "water".

Note

We thank Professor Frederic Ferraty for the permission to redistribute this data set.

Source

This data set is a part of the original one from the "Elements of Statistical Learning" website.

This data set can also be found at the NonParametric Functional Data Analysis website.

F. Ferraty and P. Vieu (2006) *Nonparametric functional data analysis*, New York: Springer.

References

F. Ferraty and P. Vieu (2003) "Curve discrimination: A nonparametric functional approach", *Computational Statistics and Data Analysis*, **44**(1-2), 161-173.

T. Hastie and R. Tibshirani and J. Friedman (2009) *The elements of statistical learning: Data mining, inference and prediction*, 2nd edn, New York: Springer.

Examples

```
plot(aa)
plot(ao)
plot(dcl)
plot(iy)
plot(sh)
```

`Pigweight` *Pig weight data*

Description

The pig weight dataset has 9 repeated weight measurements on 48 pigs.

Usage

```
data(Pigweight)
```

Format

An object of class `fds`.

Details

`Pigweight$x`: Number of weeks since measurements commenced.

`Pigweight$y`: Body weight (kg) of each pig in each week.

Note

We thank Professor Matt Wand for permission to redistribute this dataset.

Source

P. J. Diggle, P. Heagerty, K.-Y. Liang and S. L. Zeger (2002) *Analysis of Longitudinal Data*, 2nd edn, Oxford: Oxford University Press.

References

D. Ruppert, M. Wand and R. Carroll (2003) *Semiparametric Regression*, Cambridge: Cambridge University Press.

Examples

```
plot(Pigweight)
```

read.hmd *Function to read data sets from the Human Mortality Database*

Description

This function allows users to read any data set from the Human Mortality Database (HMD).

Usage

```
read.hmd(country, sex = c("Female", "Male", "Total"), file = "Mx_1x1.txt",
 username, password, yname = NULL, handle = NULL)
```

Arguments

country	Directory abbreviation from the HMD country code, e.g. Australia = "AUS".
sex	Possible options are "Male", "Female", "Total".
file	Directory abbreviation from the HMD STATS directory, e.g., "Mx_1x1.txt".
username	E-mail address registered with the HMD.
password	Authenticate password.
yname	Type of data.
handle	An httr handle object carrying the session cookie, or NULL to log in automatically.

Details

In order to read the data sets, users are required to create an account via the HMD website (https://www.mortality.org/) and obtain a valid username and password.

Value

An object of class fts.

Author(s)

Han Lin Shang and Rob J Hyndman

See Also

hmdstatistic, hmdcountry

`read.jpn` *Function to read datasets from the Japanese Human Mortality Database*

Description

This function allows users to read death rates from the Japanese Human Mortality Database.

Usage

```
read.jpn(region, label = region)
```

Arguments

`region`	Two-digit prefecture code as a character string (e.g., "00" for all of Japan)
`label`	Name of the prefecture in Japan

Details

In order to use the datasets, users are required to acknowledge the Japanese Human Mortality Database.

Value

A list of two data frames: Deaths (death counts) and pop (exposures)

Author(s)

Han Lin Shang

References

H. L. Shang and R. J. Hyndman (2017), "Grouped functional time series forecasting: An application to age-specific mortality rates", *Journal of Computational and Graphical Statistics*, **26**(2), 330-343.

See Also

`read.jpn_death`

Examples

```
Japan_rate = read.jpn(region = "00", label = "Japan")
```

`read.jpn_death` *Function to read datasets from the Japanese Human Mortality Database*

Description

This function allows users to read death counts from the Japanese Human Mortality Database

Usage

```
read.jpn_death(region, label = region)
```

Arguments

`region`	Number index of the prefecture in Japan
`label`	Name of the prefecture in Japan

Details

In order to use the datasets, users are required to acknowledge the Japanese Human Mortality Database.

Value

A data frame of death counts, a data frame of population-at-risk

Author(s)

Han Lin Shang

References

H. L. Shang and R. J. Hyndman (2017), 'Grouped functional time series forecasting: An application to age-specific mortality rates', *Journal of Computational and Graphical Statistics*, **26**(2), 330-343.

See Also

`read.jpn`

Examples

```
Japan_count = read.jpn_death(region = "00", label = "Japan")
```

`Satellite` *Satellite TOPEX/Poseidon*

Description

The data were recorded by the TOPEX/Poseidon satellite over a 25 km stretch of the Amazon River. Each waveform is recorded at 70 points, and the satellite registers 10 curves per second; in total, there are 472 curves.

Usage

```
data(Satellite)
```

Format

An object of class `fds`.

Details

Note that each wave is linked to the kind of ground surveyed by the satellite, and the idea for the Amazonian basin is to use these waveforms for altimetric and hydrological purposes.

Note

We thank Professor Frederic Ferraty for the permission to redistribute this data set.

Source

F. Frappart (2003). Catalogue des formes d'onde de l'altimètre Topex/Poseidon sur le bassin amazonien. Technical Report, CNES, Toulouse, France.

This data set can also be found at the NonParametric Functional Data Analysis website.

F. Ferraty and P. Vieu (2006) *Nonparametric functional data analysis*, New York: Springer.

References

S. Dabo-Niang and F. Ferraty and P. Vieu (2007) "On the using of modal curves for radar waveforms classification", *Computational Statistics and Data Analysis*, **51**(10), 4878-4890.

Examples

```
plot(Satellite)
```

SAtemp *Temperatures in South Australia*

Description

These data sets consist of half-hourly temperatures measured at Kent Town and Adelaide Airport from Sunday to Saturday between 6 July, 1997 and 31 March, 2007.

Usage

```
data(mondaytempkent)
data(mondaytempairport)
data(tuesdaytempkent)
data(tuesdaytempairport)
data(wednesdaytempkent)
data(wednesdaytempairport)
data(thursdaytempkent)
data(thursdaytempairport)
data(fridaytempkent)
data(fridaytempairport)
data(saturdaytempkent)
data(saturdaytempairport)
data(sundaytempkent)
data(sundaytempairport)
data(tempkent)
data(tempairport)
```

Format

An object of class `sfts`.

Details

In Adelaide, the electricity demands in summer are very volatile and highly dependent on the associated temperatures. Analyses were performed to test whether, under different temperature scenarios, there will be enough capacity to satisfy the electricity demands.

Source

Derived from the data used in Magnano et al. (2008); see References.

References

L. Magnano and J. Boland and R. Hyndman (2008) "Generation of synthetic sequences of half-hourly temperature", *Environmetrics*, **19**(8), 818-835.

Examples

```
plot(mondaytempkent)
plot(tuesdaytempkent)
plot(wednesdaytempkent)
plot(thursdaytempkent)
plot(fridaytempkent)
plot(saturdaytempkent)
plot(sundaytempkent)
plot(tempkent)
```

`SOI` *Annual Southern Oscillation Index (SOI) for the period 1900-2004*

Description

Annual measures of the Southern Oscillation Index (SOI): monthly SOI values, with each curve representing one year.

Usage

```
data(SOI)
```

Format

An object of class `fts`.

Source

The data are available at the Australian Bureau of Meteorology (https://www.bom.gov.au/).

Examples

```
plot(SOI)
```

`Spanishmigration` *Spanish migration from 1999 to 2003*

Description

This data set consists of migration numbers (in thousands) in Spain from 1999 to 2003. This data set contains the migration data of 9 age groups, namely 0-9, 10-15, 16-19, 20-29, 30-39, 40-49, 50-59, 60-64, and 65+ for both females and males.

Usage

```
data(femalemigration)
data(malemigration)
```

Format

An object of class `fts`.

Details

This data set was calculated at the time in accordance with the European Association for Population Studies (EAPS https://www.eaps.nl) methodology of 2002, which is not comparable with results calculated using the 2005 EAPS methodology.

Source

Instituto Nacional de Estadística website at https://www.ine.es/en/.

References

D. Reher and M. Requena (2009) "The National Immigration Survey of Spain. A new data source for migration studies in Europe", *Demographic Research*, **20**, 253-278.

Examples

```
plot(femalemigration)
plot(malemigration)
```

Yieldcurve *US Treasury bond yields*

Description

This data set contains monthly US Treasury bond yields from January 1970 through December 2002. The data are end-of-month price quotes based on the bid-ask midpoint.

Usage

```
data(Yieldcurve)
```

Format

An object of class `fts`.

Details

This data set is filtered to eliminate bonds with special options, such as callable and flower bonds. Illiquid securities, such as Treasury bills with less than one month to maturity and Treasury notes and bonds with less than one year to maturity, are excluded from the sample.

Source

CRSP US Treasury Database (https://indexes.morningstar.com/research-data-products/crsp-us-treasury-database).

Examples

```
plot(Yieldcurve)
```

Index

∗ **datasets**
  Ausmortality, 3
  Biscuit, 5
  Cancerrate, 6
  ECBYieldcurve, 7
  Electricityconsumption, 8
  Electricitydemand, 9
  Fat, 10
  FedYieldcurve, 11
  Moisture, 13
  Octane, 14
  Phoneme, 15
  Pigweight, 16
  Satellite, 20
  SAtemp, 21
  SOI, 22
  Spanishmigration, 22
  Yieldcurve, 23
∗ **package**
  fds-package, 2
∗ **utilities**
  hmdcountry, 11
  hmdstatistic, 12
  read.hmd, 17
  read.jpn, 18
  read.jpn_death, 19

aa *(*Phoneme*)*, 15
actfemale *(*Ausmortality*)*, 3
actmale *(*Ausmortality*)*, 3
actotal *(*Ausmortality*)*, 3
ao *(*Phoneme*)*, 15
ausfemale *(*Ausmortality*)*, 3
ausmale *(*Ausmortality*)*, 3
Ausmortality, 3
austotal *(*Ausmortality*)*, 3

Biscuit, 5

Cancerrate, 6

dcl *(*Phoneme*)*, 15

ECBYieldcurve, 7
Electricityconsumption, 8
Electricitydemand, 9

Fat, 10
Fatspectrum *(*Fat*)*, 10
Fatvalues *(*Fat*)*, 10
fds, *5*, *10*, *13–16*, *20*
fds-package, 2
FedYieldcurve, 11
femalemigration *(*Spanishmigration*)*, 22
fridaydemand *(*Electricitydemand*)*, 9
fridaytempairport *(*SAtemp*)*, 21
fridaytempkent *(*SAtemp*)*, 21

hmdcountry, 11, *13*, *17*
hmdstatistic, *12*, 12, *17*

iy *(*Phoneme*)*, 15

labc *(*Biscuit*)*, 5
labp *(*Biscuit*)*, 5

malemigration *(*Spanishmigration*)*, 22
matrix, *5*
Moisture, 13
Moisturespectrum *(*Moisture*)*, 13
Moisturevalues *(*Moisture*)*, 13
mondaydemand *(*Electricitydemand*)*, 9
mondaytempairport *(*SAtemp*)*, 21
mondaytempkent *(*SAtemp*)*, 21

nirc *(*Biscuit*)*, 5
nirp *(*Biscuit*)*, 5
nswfemale *(*Ausmortality*)*, 3
nswmale *(*Ausmortality*)*, 3
nswtotal *(*Ausmortality*)*, 3
ntfemale *(*Ausmortality*)*, 3
ntmale *(*Ausmortality*)*, 3

ntotal *(*Ausmortality*)*, 3

Octane, 14
Octanespectrum *(*Octane*)*, 14
Octanevalues *(*Octane*)*, 14

Phoneme, 15
Pigweight, 16

qldfemale *(*Ausmortality*)*, 3
qldmale *(*Ausmortality*)*, 3
qldtotal *(*Ausmortality*)*, 3

read.hmd, *12, 13*, 17
read.jpn, 18, *19*
read.jpn_death, *18*, 19

SAelectdemand *(*Electricitydemand*)*, 9
safemale *(*Ausmortality*)*, 3
samale *(*Ausmortality*)*, 3
Satellite, 20
SAtemp, 21
satotal *(*Ausmortality*)*, 3
saturdaydemand *(*Electricitydemand*)*, 9
saturdaytempairport *(*SAtemp*)*, 21
saturdaytempkent *(*SAtemp*)*, 21
sh *(*Phoneme*)*, 15
SOI, 22
Spanishmigration, 22
sundaydemand *(*Electricitydemand*)*, 9
sundaytempairport *(*SAtemp*)*, 21
sundaytempkent *(*SAtemp*)*, 21

tasfemale *(*Ausmortality*)*, 3
tasmale *(*Ausmortality*)*, 3
tastotal *(*Ausmortality*)*, 3
tempairport *(*SAtemp*)*, 21
tempkent *(*SAtemp*)*, 21
thursdaydemand *(*Electricitydemand*)*, 9
thursdaytempairport *(*SAtemp*)*, 21
thursdaytempkent *(*SAtemp*)*, 21
tuesdaydemand *(*Electricitydemand*)*, 9
tuesdaytempairport *(*SAtemp*)*, 21
tuesdaytempkent *(*SAtemp*)*, 21

vicfemale *(*Ausmortality*)*, 3
vicmale *(*Ausmortality*)*, 3
victotal *(*Ausmortality*)*, 3

wafemale *(*Ausmortality*)*, 3
wamale *(*Ausmortality*)*, 3
watotal *(*Ausmortality*)*, 3
wednesdaydemand *(*Electricitydemand*)*, 9
wednesdaytempairport *(*SAtemp*)*, 21
wednesdaytempkent *(*SAtemp*)*, 21

Yieldcurve, 23