

# Package ‘fpp2’

April 13, 2018

**Version** 2.3

**Title** Data for “Forecasting: Principles and Practice” (2nd Edition)

**Description** All data sets required for the examples and exercises in the book “Forecasting: principles and practice” by Rob J Hyndman and George Athanasopoulos <<https://OTexts.org/fpp2/>>. All packages required to run the examples are also loaded.

**Depends** R (>= 2.10), ggplot2, forecast (>= 8.3), fma, expsmooth

**Suggests** GGally,gridExtra,Mcomp,purrr,seasonal,tidyverse,vars

**LazyData** yes

**LazyLoad** yes

**License** GPL (>= 3)

**RoxygenNote** 6.0.1

**URL** <https://pkg.robjhyndman.com/fpp2-package>,  
<https://github.com/robjhyndman/fpp2-package>,  
<https://OTexts.org/fpp2/>

**NeedsCompilation** no

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fpp-package *Data for "Forecasting: principles and practice" (2nd ed, 2017)*

---

**Description**

All data sets required for the examples and exercises in the book "Forecasting: principles and practice" (2nd ed, 2017) by Rob J Hyndman and George Athanasopoulos. This package also loads other packages required for the book.

**Author(s)**

Rob J Hyndman

**References**

Hyndman, R.J., and Athanasopoulos, G. (2017). *Forecasting: principles and practice*, OTexts: Melbourne, Australia. <https://OTexts.org/fpp2/>

**See Also**

[forecast](#) package

---

a10

*Monthly anti-diabetic drug sales in Australia from 1991 to 2008.*

---

**Description**

Total monthly scripts for pharmaceutical products falling under ATC code A10, as recorded by the Australian Health Insurance Commission. July 1991 - June 2008.

**Format**

Monthly time series of class `ts`.

**Source**

Medicare Australia

**Examples**

```
autoplot(a10)
ggseasonplot(a10)
```

---

arrivals

*International Arrivals to Australia*

---

**Description**

Quarterly international arrivals (in thousands) to Australia from Japan, New Zealand, UK and the US. 1981Q1 - 2012Q3.

**Format**

Quarterly time series of class `ts`.

**Source**

Tourism Research Australia.

**Examples**

```
autoplot(arrivals)
```

---

ausair

*Air Transport Passengers Australia*

---

**Description**

Total annual air passengers (in millions) including domestic and international aircraft passengers of air carriers registered in Australia. 1970-2016.

**Format**

Annual time series of class ts.

**Source**

World Bank. <https://data.is/x5KiE0>

**Examples**

```
autoplot(ausair)
```

---

ausbeer

*Quarterly Australian Beer production*

---

**Description**

Total quarterly beer production in Australia (in megalitres) from 1956:Q1 to 2010:Q2.

**Format**

Quarterly time series of class ts.

**Source**

Australian Bureau of Statistics. Cat. 8301.0.55.001.

**Examples**

```
data(ausbeer)  
ggseasonplot(ausbeer)
```

---

auscafe	<i>Monthly expenditure on eating out in Australia</i>
---------	---

---

**Description**

The total monthly expenditure on cafes, restaurants and takeaway food services in Australia (\$billion). April 1982 - September 2017.

**Format**

Monthly time series of class ts.

**Source**

Australian Bureau of Statistics. Catalogue No. 8501.0

**Examples**

```
autoplot(auscafe)
```

---

austa	<i>International visitors to Australia</i>
-------	--

---

**Description**

Total international visitors to Australia (in millions). 1980-2015.

**Format**

Annual time series of class ts.

**Source**

International Visitor Survey, Tourism Research Australia.

**Examples**

```
autoplot(austa)
```

---

austourists

*International Tourists to Australia: Total visitor nights.*

---

**Description**

Quarterly visitor nights (in millions) spent by international tourists to Australia. 1999-2015.

**Format**

Quarterly time series of class `ts`.

**Source**

Tourism Research Australia.

**Examples**

```
autoplot(austourists)
```

---

calls

*Call volume for a large North American bank*

---

**Description**

Five-minute call volume handled on weekdays between 7:00am and 9:05pm, from 3 March 2003 to 23 May 2003.

**Format**

Time series object of class `msts`.

**Source**

Rob Hyndman

**Examples**

```
autoplot(calls, xlab="Weeks")
```

---

debitcards	<i>Retail debit card usage in Iceland.</i>
------------	--

---

**Description**

Monthly retail debit card usage in Iceland (million ISK). January 2000 - August 2013.

**Format**

Monthly time series of class `ts`.

**Source**

Statistics Iceland. <https://data.is/HFzL69>

**Examples**

```
autoplot(debitcards)
```

---

departures	<i>Total monthly departures from Australia</i>
------------	--

---

**Description**

Overseas departures from Australia: permanent departures, long-term (more than one year) residents departing, long-term (more than one year) visitors departing, short-term (less than one year) residents departing and short-term (less than one year) visitors departing. January 1976 - November 2016.

**Format**

Multiple monthly time series of class `mts` containing the following series:

permanent	permanent departures from Australia.
reslong	long-term resident departures from Australia.
vislong	long-term visitor departures from Australia.
resshort	short-term resident departures from Australia.
visshort	short-term visitor departures from Australia.

**Source**

Australian Bureau of Statistics. Catalogue No 3401.02.

## Examples

```
autoplot(departures, facets=TRUE)
```

---

elecdemand	<i>Half-hourly and daily electricity demand for Victoria, Australia, in 2014</i>
------------	--

---

## Description

elecdemand is a half-hourly time series matrix with three columns:

Demand: Total electricity demand in GW for Victoria, Australia, every half-hour during 2014.  
WorkDay: taking value 1 on work days, and 0 otherwise.  
Temperature: half-hourly temperatures for Melbourne (BOM site 086071).

elecdaily is a daily time series matrix with three columns:

Demand: Total electricity demand in GW for Victoria, Australia, every day during 2014.  
WorkDay: taking value 1 on work days, and 0 otherwise.  
Temperature: maximum daily temperatures for Melbourne (BOM site 086071).

## Format

Multiple time series of class `mts`.

## Details

This data is for operational demand, which is the demand met by local scheduled generating units, semi-scheduled generating units, and non-scheduled intermittent generating units of aggregate capacity larger than 30 MW, and by generation imports to the region. The operational demand excludes the demand met by non-scheduled non-intermittent generating units, non-scheduled intermittent generating units of aggregate capacity smaller than 30 MW, exempt generation (e.g. rooftop solar, gas tri-generation, very small wind farms, etc), and demand of local scheduled loads. It also excludes some very large industrial users (such as mines or smelters).

## Source

Australian Energy Market Operator, and the Australian Bureau of Meteorology.

## Examples

```
summary(elecdemand)  
summary(elecdaily)
```



---

elecequip

*Electrical equipment manufactured in the Euro area.*

---

**Description**

Monthly manufacture of electrical equipment: computer, electronic and optical products. January 1996 - March 2012. Data adjusted by working days; Euro area (17 countries). Industry new orders index. 2005=100.

**Format**

Time series object of class `ts`.

**Source**

Eurostat. <https://data.is/y6d08i>

**Examples**

```
autoplot(elecequip)
```

---

elecsales

*Electricity sales to residential customers in South Australia.*

---

**Description**

Annual electricity sales for South Australia in GWh from 1989 to 2008. Electricity used for hot water has been excluded.

**Format**

Time series object of class `ts`.

**Source**

Australian Energy Market Operator.

**Examples**

```
autoplot(elecsales)
```

---

`euretail`*Quarterly retail trade: Euro area.*

---

**Description**

Quarterly retail trade index in the Euro area (17 countries), 1996-2011, covering wholesale and retail trade, and repair of motor vehicles and motorcycles. (Index: 2005 = 100).

**Format**

Quarterly time series of class `ts`.

**Source**

Eurostat. <https://data.is/IdKyZr>

**Examples**

```
autoplot(euretail)
```

---

`gasoline`*US finished motor gasoline product supplied.*

---

**Description**

Weekly data beginning 2 February 1991, ending 20 January 2017. Units are "million barrels per day".

**Format**

Time series object of class `ts`.

**Source**

US Energy Information Administration.

**Examples**

```
autoplot(gasoline, xlab="Year")
```

---

`goog`*Daily closing stock prices of Google Inc*

---

**Description**

Closing stock prices of GOOG from the NASDAQ exchange, for 1000 consecutive trading days between 25 February 2013 and 13 February 2017. Adjusted for splits. `goog200` contains the first 200 observations from `goog`.

**Format**

Daily time series of class `ts`.

**Source**

<https://goo.gl/5KBjL5>

**Examples**

```
autoplot(goog)
```

---

`guinearice`*Rice production (Guinea)*

---

**Description**

Total annual rice production (million metric tons) for Guinea. 1970-2011.

**Format**

Annual time series of class `ts`.

**Source**

World Bank. <https://data.is/whKD8H>

**Examples**

```
autoplot(guinearice)
```

h02 *Monthly corticosteroid drug sales in Australia from July 1991 to June 2008.*

---

**Description**

Total monthly scripts for pharmaceutical products falling under ATC code H02, as recorded by the Australian Health Insurance Commission. Measured in millions of scripts.

**Format**

Monthly time series of class ts.

**Source**

Medicare Australia

**Examples**

```
autoplot(h02)
ggseasonplot(h02)
```

---

hyndsight *Daily pageviews for the Hyndsight blog. 30 April 2014 to 29 April 2015.*

---

**Description**

Hyndsight is Rob Hyndman's personal blog at <https://robjhyndman.com/hyndsight>. This series contains the daily pageviews for one year, beginning 30 April 2014. The frequency is set to 7, to allow the weekly pattern to be modelled.

**Format**

Time series object of class ts.

**Source**

Rob Hyndman

**Examples**

```
autoplot(hyndsight, xlab="Weeks")
```

---

insurance

*Insurance quotations and advertising expenditure.*

---

**Description**

Monthly quotations and monthly television advertising expenditure for a US insurance company. January 2002 to April 2005.

**Format**

Monthly time series of class ts.

**Source**

Kindly provided by Dave Reilly, Automatic Forecasting Systems.

**Examples**

```
autoplot(insurance)
```

---

livestock

*Livestock (sheep) in Asia, 1961-2007.*

---

**Description**

Annual sheep livestock numbers in Asia (in million head).

**Format**

Annual time series of class ts.

**Source**

United Nations. <https://data.is/GFwxQi>

**Examples**

```
autoplot(livestock)
```

---

marathon

*Boston marathon winning times since 1897*

---

**Description**

Winning times (in minutes) for the Boston Marathon Men's Open Division. 1897-2016.

**Format**

Annual time series of class ts.

**Source**

Boston Athletic Association. <http://www.baa.org/races/boston-marathon/boston-marathon-history/champions/mens-open-division.aspx>

**Examples**

```
autoplot(marathon)
```

---

maxtemp

*Maximum annual temperatures at Moorabbin Airport, Melbourne*

---

**Description**

Maximum annual temperatures (degrees Celsius) for Moorabbin Airport, Melbourne. 1971-2016.

**Format**

Annual time series of class ts.

**Source**

Australian Bureau of Meteorology.

**Examples**

```
autoplot(maxtemp)
```

---

melsyd	<i>Total weekly air passenger numbers on Ansett airline flights between Melbourne and Sydney, 1987–1992.</i>
--------	--

---

**Description**

Air traffic numbers are in thousands, and divided into first class, business class and economy class. There was a major pilots' industrial dispute during the data period resulting in some weeks with zero traffic. There was also at least two changes in the definitions of passenger classes.

**Format**

Multiple time series of class mts.

**Source**

Ansett Airlines (which no longer exists).

**Examples**

```
autoplot(melsyd, facets=TRUE)
```

---

mens400	<i>Winning times in Olympic men's 400m track final. 1896-2016.</i>
---------	--

---

**Description**

Times in seconds for the gold-medal winner of the men's 400m track final at each Olympics since 1896. Missing values occur in 1916, 1940 and 1944 due to the World Wars.

**Format**

time series of class ts with frequency 1/4.

**Examples**

```
autoplot(mens400)
```

---

`oil`*Annual oil production in Saudi Arabia*

---

**Description**

Annual oil production (millions of tonnes), Saudi Arabia, 1965-2013.

**Format**

Annual time series of class `ts`.

**Source**

BP. <https://data.is/GEOHU3>

**Examples**

```
autoplot(oil)
```

---

`prison`*prison*

---

**Description**

`prison`

**Format**

Quarterly time series of prisoner numbers in Australia from 2005 to 2016, split by sex, state and legal status. `prisonLF` is a long-form version of the data of class `data.frame`, while `prison` is in wide form and of class `mts`.

**Examples**

```
autoplot(prison)
head(prisonLF)
```



---

qauselec

*Quarterly Australian Electricity production*

---

**Description**

Total quarterly electricity production in Australia (in billion kWh) from 1956:Q1 to 2010:Q2.

**Format**

Quarterly time series of class ts.

**Source**

Australian Bureau of Statistics. Cat. 8301.0.55.001.

**Examples**

```
autoplot(qauselec)
```

---

qcement

*Quarterly Australian Portland Cement production*

---

**Description**

Total quarterly production of Portland cement in Australia (in millions of tonnes) from 1956:Q1 to 2014:Q1.

**Format**

Quarterly time series of class ts.

**Source**

Australian Bureau of Statistics. Cat. 8301.0.55.001.

**Examples**

```
autoplot(qcement)
```

---

qgas

*Quarterly Australian Gas Production*

---

**Description**

Total quarterly gas production in Australia (in petajoules) from 1956:Q1 to 2010:Q2.

**Format**

Quarterly time series of class ts.

**Source**

Australian Bureau of Statistics. Cat. 8301.0.55.001.

**Examples**

```
autoplot(qgas)
```

---

sunspotarea

*Annual average sunspot area (1875-2015)*

---

**Description**

Annual averages of the daily sunspot areas (in units of millionths of a hemisphere) for the full sun. Sunspots are magnetic regions that appear as dark spots on the surface of the sun. The Royal Greenwich Observatory compiled daily sunspot observations from May 1874 to 1976. Later data are from the US Air Force and the US National Oceanic and Atmospheric Administration. The data have been calibrated to be consistent across the whole history of observations.

**Format**

Annual time series of class ts.

**Source**

NASA

**Examples**

```
autoplot(sunspotarea)
```

---

uschange	<i>Growth rates of personal consumption and personal income in the USA.</i>
----------	---

---

**Description**

Percentage changes in quarterly personal consumption expenditure, personal disposable income, production, savings and the unemployment rate for the US, 1960 to 2016.

**Format**

Time series object of class `ts`.

**Source**

Federal Reserve Bank of St Louis. <https://data.is/AnVtzB>. <https://data.is/wQPcjU>.

**Examples**

```
autoplot(uschange, facet=TRUE)
```

---

usmelec	<i>Electricity monthly total net generation. January 1973 - June 2013.</i>
---------	--

---

**Description**

Electricity net generation measured in billions of kilowatt hours (kWh).

**Format**

Time series object of class `ts`.

**Source**

US Energy Information Administration. <https://data.is/zgRWCO>.

**Examples**

```
autoplot(usmelec)
```

---

visnights

*Quarterly visitor nights for various regions of Australia.*

---

**Description**

Total quarterly visitor nights (in millions) from 1998-2016 for twenty regions of Australia within six states. The states are: New South Wales, Queensland, South Australia, Victoria, Western Australia, and Other.

**Format**

Time series object of class mts.

**Source**

Tourism Research Australia.

**Examples**

```
autoplot(visnights)
```

---

wmurders

*Annual female murder rate (per 100,000 standard population) in the USA. 1950-2004.*

---

**Description**

Total Murdered women, per 100 000 standard population.

**Format**

Annual time series of class ts.

**Source**

Gapminder Foundation. <https://data.is/XKa24F>

**Examples**

```
autoplot(wmurders)
```

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