Package 'fma'

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Title Data sets from ''Forecasting: methods and applications'' by Makridakis, Wheelwright & Hyndman (1998)

Description All data sets from ''Forecasting: methods and applications''by Makridakis, Wheelwright & Hyndman (Wiley, 3rd ed., 1998).

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Author Rob J Hyndman <Rob.Hyndman@monash.edu>

Maintainer Rob J Hyndman <Rob.Hyndman@monash.edu>

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`fma-package` *Data sets from "Forecasting: methods and applications" by Makridakis, Wheelwright and Hyndman (1998)*

Description

All data sets from "Forecasting: methods and applications" by Makridakis, Wheelwright and Hyndman (Wiley, 3rd ed., 1998).

Author(s)

Rob J Hyndman. <Rob.Hyndman@buseco.monash.edu.au>

References

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. http://www.robhyndman.info/forecasting

---

advert *Sales and advertising expenditure*

Description

Monthly sales and advertising expenditure for an automotive parts company.

Usage

```
advert
```

Format

Data frame containing the following columns:

advert Monthly Advertising expenditure

sales Monthly sales volume

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 6.7. Exercise 8.1.

Examples

```
plot(sales ~ advert, data=advert)
```

---

advsales *Sales volume and advertising expenditure*

Description

Sales volume and advertising expenditure for a dietary weight control product.

Usage

```
advsales
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 8.

References

Blattberg and Jeuland (1981).

Examples

```
plot(advsales)
```

`airpass` *Monthly Airline Passenger Numbers 1949-1960*

Description

The classic Box & Jenkins airline data. Monthly totals of international airline passengers (1949–1960).

Usage

```
airpass
```

Format

A monthly time series, in thousands.

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 2.4, Chapter 3, Exercise 4.7.

References

Box, Jenkins and Reinsell (1994) *Time series analysis: forecasting and control*, 3rd edition, Holden-Day: San Francisco. Series G.

Examples

```
plot(airpass)
seasonplot(airpass)
tsdisplay(airpass)
```

auto *Attributes of some US and Japanese automobiles*

Description

Price, mileage, age and country of origin for 45 automobiles.

Usage

```
auto
```

Format

This data frame contains the following columns:

Model Name of model

Country Country of manufacture

Mileage Mileage per gallon

Price Price of car at time of measurement

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, Wiley: New York. Chapter 2.

References

Consumer Reports, April 1990, pp.235-255.

Examples

```
plot(Price ~ Mileage, data=auto,pch=19,col=2)
points(auto$Mileage[auto$Country=="USA"],auto$Price[auto$Country=="USA"],pch=19,col=4)
legend(30,25000,legend=c("USA","Japan"),pch=19,col=c(4,2))
```

bank *Mutual savings bank deposits*

Description

Deposits in a mutual savings bank in a large metropolitan area.

Usage

```
bank
```

Format

Data frame containing the following columns:

EOM End of month balance

AAA Composite AAA bond rates

threefour US Government 3-4 year bonds

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 6.

Examples

```
plot(bank)
```

---

beer *Monthly beer production*

Description

Monthly Australian beer production: Jan 1991 – Aug 1995.

Usage

```
beer
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 2.

Examples

```
plot(beer)
seasonplot(beer)
tsdisplay(beer)
```

bicoal *Annual bituminous coal production*

Description

Annual bituminous coal production in the USA: 1920–1968.

Usage

```
bicoal
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 7.7.

Examples

```
tsdisplay(bicoal)
```

books *Sales of paperback and hardcover books*

Description

Daily sales of paperback and hardcover books at the same store.

Usage

```
books
```

Format

Bivariate time series containing the following columns:

Paperback Number of paperback sales each day

Hardcover Number of hardcover sales each day

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 4.5.

Examples

```
plot(books)
```

`boston` *Monthly dollar volume of sales*

Description

Monthly dollar volume of sales on Boston stock exchange and combined New York and American stock exchange. January 1967 – November 1969.

Usage

```
boston
```

Format

Bivariate time series containing the following columns:

nyase New York and American Stock Exchange dollar volume

bse Boston Stock Exchange dollar volume

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 6.5

References

McGee and Carleton (1970) Piecewise regression, *Journal of the American Statistical Association*, **65**, 1109–1124.

Examples

```
plot(boston)
```

bricksq *Quarterly clay brick production*

Description

Australian quarterly clay brick production: 1956–1994.

Usage

```
bricksq
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 1 and Exercise 2.3.

Examples

```
plot(bricksq)
seasonplot(bricksq)
tsdisplay(bricksq)
```

canadian *Canadian unemployment rate*

Description

Canadian unemployment rate as a percentage of the civilian labor force between 1974 and the third quarter of 1975.

Usage

```
canadian
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 4.1.

Examples

```
plot(canadian)
```

`capital` *Quarterly capital expenditure and appropriations*

Description

Seasonally adjusted quarterly capital expenditure and appropriations in U.S. manufacturing: 1953–1974.

Usage

```
capital
```

Format

Bivariate time series containing the following columns:

capital Quarterly capital expenditure for US manufacturing.

appropriations Quarterly capital appropriations for US manufacturing.

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 8.

Examples

```
plot(capital)
```

`cement` *Cement composition and heat data*

Description

Cement composition and heat data.

Usage

```
cement
```

Format

Data frame containing the following columns:

pc1 Percentage by weight of component 1

pc2 Percentage by weight of component 2

pc3 Percentage by weight of component 3

heat Heat emitted in calories per gram of cement.

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 6.4

Examples

```
plot(cement)
```

---

chicken *Price of chicken*

Description

Price of chicken in US (constant dollars): 1924–1993.

Usage

```
chicken
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
plot(chicken)
```

condmilk *Condensed milk*

Description

Manufacturer's Stocks of evaporated and sweetened condensed milk.

Usage

```
condmilk
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 7.5.

Examples

```
plot(condmilk)
seasonplot(condmilk)
tsdisplay(condmilk)
```

copper *Copper price*

Description

Yearly copper prices, 1800–1997 (in constant 1997 dollars).

Usage

```
copper
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
plot(copper)
```

copper1 *Copper prices*

Description

Monthly copper prices for 28 consecutive months (in constant 1997 dollars).

Usage

```
copper1
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
plot(copper1)
```

copper2 *Copper prices*

Description

Yearly copper prices for 14 consecutive years (in constant 1997 dollars).

Usage

```
copper2
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
plot(copper2)
```

copper3 *Copper prices*

Description

Yearly copper prices for 43 consecutive years (in constant 1997 dollars).

Usage

```
copper3
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
plot(copper3)
```

cowtemp *Temperature of a cow*

Description

Daily morning temperature of a cow. Measure at 6.30am for 75 consecutive mornings by counting chirps from a telemetric thermometer implanted in the cow. Data are chirps per 5-minute interval minus 800.

Usage

```
cowtemp
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercises 2.3 and 2.4.

References

Velleman, Paul. (1981) *The ABC of EDA*, Duxbury Press.

Examples

```
plot(cowtemp)
tsdisplay(cowtemp)
```

`cpimel` *Consumer price index*

Description

Quarterly CPI (consumer price index) for Victoria: Q1 1980 to Q2 1995.

Usage

```
cpimel
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 8.7.

Examples

```
tsdisplay(cpimel)
```

`dexter` *Dexterity test and production ratings*

Description

Scores on manual dexterity test and production ratings for 20 workers.

Usage

```
dexter
```

Format

Data frame containing the following columns:

score Test score for manual dexterity

production Production rating

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 5.4

Examples

```
plot(production~score,data=dexter,pch=19,col=3)
```

---

dj *Dow-Jones index*

Description

Dow-Jones index on 251 trading days ending 26 Aug 1994.

Usage

```
dj
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 7.

References

Brockwell and Davis (1996)

Examples

```
tsdisplay(dj)
```

dole *Unemployment benefits in Australia*

Description

Monthly total of people on unemployment benefits in Australia (Jan 1965 – Jul 1992).

Usage

```
dole
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 2.3.

Examples

```
plot(dole)
tsdisplay(dole)
```

dowjones *Dow-Jones index*

Description

Dow-Jones index, 28 Aug - 18 Dec 1972.

Usage

```
dowjones
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 2.7.

Examples

```
tsdisplay(dowjones)
```

econsumption *Electricity consumption and temperature*

Description

Electricity consumption and maximum temperature for 12 randomly chosen days.

Usage

```
temperature
```

Format

Data frame containing the following columns:

Mwh Daily electricity consumption (megawatt-hours)

temp Daily maximum temperature (degrees Celsius)

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 5.5

Examples

```
plot(Mwh ~ temp, data=econsumption,pch=19,col=4)
```

eggs *Price of eggs*

Description

Price of dozen eggs in US, 1900–1993, in constant dollars.

Usage

```
eggs
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
plot(eggs)
```

`eknives` *Sales of electric knives*

Description

Sales of electric knives: Jan 1991 - April 1992.

Usage

```
eknives
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 4.2.

Examples

```
plot(eknives)
```

`elco` *Sales of Elco's laser printers*

Description

Sales of Elco's laser printers: 1992–1998.

Usage

```
elco
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 10.

Examples

```
plot(elco)
```

`elec` *Electricity production*

Description

Australian monthly electricity production: Jan 1956 – Aug 1995.

Usage

```
elec
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapters 1–2, 7.

Examples

```
plot(elec)
seasonplot(elec)
tsdisplay(elec)
```

`expenditure` *Expenditure*

Description

Expenditure for 12 supermarket customers.

Usage

```
expenditure
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 2.

Examples

```
hist(expenditure)
```

`fancy` *Sales for a souvenir shop*

Description

Monthly sales for a souvenir shop on the wharf at a beach resort town in Queensland, Australia.

Usage

```
fancy
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 5.8.

Examples

```
plot(fancy)
seasonplot(fancy)
```

`french` *Industry index*

Description

French index of industry.

Usage

```
french
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 4.4.

Examples

```
plot(french)
```

`housing` *Housing data*

Description

Monthly housing starts, construction contracts and average new home mortgage rates (Jan 1983 - Oct 1989).

Usage

```
housing
```

Format

Trivariate time series containing the following columns:

hstarts Monthly housing starts (thousands of units)

construction Construction contracts (millions of dollars)

interest Average new home mortgage rates

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 8.

References

Survey of current business, US Department of Commerce, 1990.

Examples

```
plot(housing)
```

hsales *Sales of one-family houses*

Description

Monthly sales of new one-family houses sold in the USA since 1973.

Usage

```
hsales
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 3.

References

US Census Bureau, Manufacturing and Construction Division

Examples

```
plot(hsales)
plot(stl(hsales,"periodic"),main="Sales of new one-family houses, USA")
```

hsales2 *Sales of new one-family houses*

Description

Sales of new one-family houses in the USA (Jan 1987 – Nov 1995).

Usage

```
hsales2
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 7.10.

Examples

```
plot(hsales2)
seasonplot(hsales2)
tsdisplay(hsales2)
```

---

huron *Level of Lake Huron*

Description

Level of Lake Huron in feet (reduced by 570 feet): 1875–1972.

Usage

```
huron
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 8.2.

Examples

```
plot(huron)
```

---

ibm *IBM sales and profit*

Description

IBM sales and profit (1954-1984) and forecasts.

Usage

```
ibm
```

Format

Time series data

Sales IBM annual sales

Profit IBM annual profit

FSales Forecast of IBM sales made in 1984

FProfit Forecast of IBM profits made in 1984

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
par(mfrow=c(2,1))
plot(ibm[,1],xlim=c(1954,2000),ylim=c(0,200),
    ylab="Sales (billions of $)",xlab="Year",type="o")
lines(ibm[,3],col=2,type="o")
plot(ibm[,2],xlim=c(1954,2000),ylim=c(-10,30),
    ylab="Profits (billions of $)",xlab="Year",type="o")
lines(ibm[,4],col=2,type="o")
```

---

ibmclose *Closing IBM stock price*

Description

Daily closing IBM stock price.

Usage

```
ibmclose
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 7.2.

References

Box, Jenkins and Reinsell (1994) *Time series analysis: forecasting and control*, 3rd edition, Holden-Day: San Francisco.

Examples

```
tsdisplay(ibmclose)
```

`input` *Input series*

Description

Input series for exercise 8.6.

Usage

```
input
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 8.6.

Examples

```
plot(input)
```

`internet` *Number of internet users*

Description

Number of users logged on to an internet server each minute over a 100-minute period.

Usage

```
internet
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 7.

Examples

```
tsdisplay(internet)
```

`invent15` *Inventory demand*

Description

Inventory demand for product E15.

Usage

```
invent15
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 2.6. Also Chapter 4.

Examples

```
plot(invent15)
```

`jcars` *Motor vehicle production*

Description

Japanese motor vehicle production in thousand (1947–1989).

Usage

```
jcars
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 2.8. Chapter 8.

References

World motor vehicle data, Motor Vehicle Manufacturers of US Inc, Detroit, 1991.

Examples

```
plot(jcars)
log.jcars <- BoxCox(jcars,0)
jcars.f <- holt(log.jcars)
plot(jcars.f)
```

---

kkong *King Kong data*

Description

King Kong data.

Usage

```
kkong
```

Format

Data frame consisting of following columns

weight Weights of 21 gorillas

height Heights of 21 gorillas

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 5. Exercise 5.6.

Examples

```
plot(weight~height,data=kkong,pch=19,col=2)
```

labour *Civilian labour force*

Description

Number of persons in the civilian labour force in Australia each month (Feb 1978 - Aug 1995).

Usage

```
labour
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 3.8.

Examples

```
plot(labour)
labour.stl <- stl(labour,10)
plot(labour.stl)
monthplot(labour.stl$time.series[,1],type="h")
```

lynx *Annual Canadian Lynx trappings 1821–1934*

Description

Annual number of lynx trapped in McKenzie river district of northwest Canada: 1821–1934.

Usage

```
lynx
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 2.3.

References

Campbell, M. J.and A. M. Walker (1977). A Survey of statistical work on the Mackenzie River series of annual Canadian lynx trappings for the years 1821–1934 and a new analysis. *Journal of the Royal Statistical Society series A*, **140**, 411–431.

Examples

```
plot(lynx)
tsdisplay(lynx)
```

`milk` *Monthly milk production per cow*

Description

Average monthly milk production per cow over 14 years.

Usage

```
milk
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 2.

References

Cryer (1986) *Time series analysis*, Duxbury Press: Belmont.

Examples

```
par(mfrow=c(2,1))
plot(milk,xlab="Year",ylab="pounds",
    main="Monthly milk production per cow")
milk.adj <- milk/monthdays(milk)*365.25/12
plot(milk.adj,xlab="Year",ylab="pounds",
    main="Adjusted monthly milk production per cow")
```

mink *Number of minks trapped*

Description

Annual number of minks trapped in McKenzie river district of northwest Canada: 1848–1911.

Usage

```
mink
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 2.4.

Examples

```
tsdisplay(mink)
```

mortal *Mortality*

Description

Bird mortality for 156 poultry farms, Aug 1995 - Jul 1996.

Usage

```
mortal
```

Format

Data frame containing the following columns:

typeA Percentage of Type A birds for each farm.

mortality Percentage mortality of all birds for each farm.

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 5.9

Examples

```
plot(mortality~typeA,data=mortal)
```

`motel` *Total accommodation at hotel, motel and guest house*

Description

Total room nights occupied and total monthly takings from accommodation at hotel, motel and guest house in Victoria, Australia: Jan 1980 - June 1995.

Usage

```
motel
```

Format

Trivariate time series containing the following columns:

Roomnights Total room nights

Takings Total monthly takings (thousands of dollars)

CPI Quarterly CPI values

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 8.7.

Examples

```
plot(motel[,2],motel[,1], xlab="Room nights", ylab="Takings",pch=19,col=4)
```

`motion` *Employment figures in the motion picture industry*

Description

Monthly employment figures for the motion picture industry (SIC Code 78): Jan 1955 – Dec 1970.

Usage

```
motion
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 7.9.

References

"Employment and earnings, US 1909–1978", Department of Labor, 1979.

Examples

```
plot(motion)
seasonplot(motion)
tsdisplay(motion)
```

---

nail *Nail prices*

Description

Nail prices, 1800–1996 in constant dollars.

Usage

```
nail
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
plot(nail)
```

oilprice *Oil prices*

Description

Oil prices in constant 1997 dollars: 1870–1997.

Usage

```
oilprice
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 10.

Examples

```
plot(oilprice)
```

olympic *Men's 400 m final winning times in each Olympic Games*

Description

Winning times for the men's 400 m final in each Olympic Games: 1896–1996.

Usage

```
olympic
```

Format

Data frame containing the following columns:

Year Year of Olympics

time Winning time in 400m final

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 5.7

Examples

```
plot(time~Year,data=olympic,pch=19,col=3)
```

---

ozone *Ozone depletion and melanoma rates*

Description

Ozone depletion and melanoma rates in various locations.

Usage

```
ozone
```

Format

Data frame containing the following columns:

ozonedep Ozone depletion rates as percentages

melanoma Melanoma rates as percentages

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 5.3.

Examples

```
plot(ozonedep~melanoma,data=ozone,pch=19,col=2)
```

---

paris *Average temperature*

Description

Average monthly temperature in Paris.

Usage

```
paris
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 2.1.

Examples

```
plot(paris)
seasonplot(paris)
tsdisplay(paris)
```

---

pcv *GDP*

Description

GDP for Western Europe and PCV industry sales.

Usage

```
pcv
```

Format

Bivariate time series consisting of the following columns

GDP GDP Western Europe

PCV PCV Industry sales

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 5.

Examples

```
plot(PCV~GDP,data=pcv,pch=20,col=2)
```

petrol *Sales of petroleum and related product*

Description

US monthly sales of petroleum and related product: Jan 1971 - Dec 1991.

Usage

```
petrol
```

Format

Multivariate time series data:

Chemicals Sales of chemicals and allied products

Coal Sales of Bituminous coal products

Petrol Sales of petroleum and coal products

Vehicles Sales of motor vehicles and parts

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 8.

Examples

```
plot(petrol)
```

pigs *Number of pigs slaughtered*

Description

Monthly total number of pigs slaughtered in Victoria, Australia (Jan 1980 – Aug 1995).

Usage

```
pigs
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 7.

Examples

```
tsdisplay(pigs)
```

---

plastics *Sales of plastic product*

Description

Monthly sales of product A for a plastics manufacturer.

Usage

```
plastics
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 3.5.

Examples

```
plot(plastics)
seasonplot(plastics)
plot(stl(plastics,"periodic"))
```

---

pollution *Shipment of pollution equipment*

Description

Monthly shipments of pollution equipment (in thousands of French francs), Jan 1986 – Oct 1996.

Usage

```
pollution
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 7.

Examples

```
tsdisplay(pollution)
```

`productC` *Sales of product C*

Description

Sales of product C (a lubricant sold in large containers).

Usage

```
productC
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 1.

Examples

```
plot(productC)
```

pulpprice *Pulp price and shipments*

Description

World pulp price and shipments.

Usage

```
pulpprice
```

Format

Data frame consisting of following columns

shipments World pulp shipments

price World pulp price

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 5.

Examples

```
plot(shipments~price,data=pulpprice)
```

qelec *Electricity production*

Description

Quarterly electricity production.

Usage

```
qelec
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 3.4.

Examples

```
plot(decompose(qelec))
```

`qsales` *Sales data*

Description

Quarterly exports of a French company in thousands of francs.

Usage

```
qsales
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 3.7 and Table 4-7.

Examples

```
plot(qsales)
```

`running` *Running times and maximal aerobic capacity*

Description

Running times and maximal aerobic capacity for 14 female runners.

Usage

```
running
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 2.5.

References

Conley, Krahenbuhl, Burkett and Millar (1981) Physiological correlates of female road racing performance, *Research Quarterly Exercise Sport*, **52**, 441–448.

Examples

```
plot(times~capacity,data=running,pch=19,col=2)
```

`sales` *Sales data*

Description

Sales data over 10 time periods.

Usage

```
sales
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 5.

Examples

```
plot(sales,type="p")
abline(lsfit(1:10,sales))
```

`schizo` *Perceptual speed scores*

Description

Daily perceptual speed scores for a schizophrenic patient. The patient began receiving a powerful tranquilizer (chlorpromzaine) on the 61st day and continued receiving the drug for the remainder of the sample period. It is expected that this drug would reduce perceptual speed.

Usage

```
schizo
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 8.8.

References

McCleary and Hay (1980).

Examples

```
plot(schizo)
```

`shampoo` *Sales of shampoo*

Description

Sales of shampoo over a three year period.

Usage

```
shampoo
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 3.

Examples

```
plot(shampoo)
```

sheep *Sheep population*

Description

Sheep population (in millions) of England and Wales: 1867–1939.

Usage

```
sheep
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 7.6.

References

Kendall (1976).

Examples

```
tsdisplay(sheep)
```

ship *Electric can opener shipments*

Description

Electric can opener shipments.

Usage

```
ship
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 4. Exercise 4.6.

Examples

```
plot(ship)
```

`shipex` *Shipments*

Description

Shipments

Usage

```
shipex
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 3.1

Examples

```
plot(shipex)
```

`strikes` *Number of strikes*

Description

Number of strikes in the US from 1951 to 1980.

Usage

```
strikes
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 7.4

References

Brockwell and Davis (1991)

Examples

```
tsdisplay(strikes)
```

`telephone` *Telephone cost*

Description

Telephone cost in San Francisco, New York: 1915–1996.

Usage

```
telephone
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
plot(telephone)
```

`texasgas` *Price and consumption of natural gas*

Description

Price and per capita consumption of natural gas in 20 towns in Texas.

Usage

```
texasgas
```

Format

Data frame containing the following columns:

price Average price in cents per thousand cubic feet

consumption Consumption per customer in thousand cubic feet.

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 5.10. Exercise 6.2.

Examples

```
plot(consumption ~ price, data=texasgas)
```

---

ukdeaths *Total deaths and serious injuries*

Description

Monthly total deaths and serious injuries on UK roads: Jan 1975 – Dec 1984. In February 1983, new legislation came into force requiring seat belts to be worn.

Usage

```
ukdeaths
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 8.

References

Harvey (1989)

Examples

```
plot(ukdeaths)
seasonplot(ukdeaths)
tsdisplay(ukdeaths)
```

usdeaths *Accidental deaths in USA*

Description

Monthly accidental deaths in USA.

Usage

```
usdeaths
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercises 2.3 and 2.4.

Examples

```
plot(usdeaths)
seasonplot(usdeaths)
tsdisplay(usdeaths)
```

uselec *Total generation of electricity*

Description

Monthly total generation of electricity by the U.S. electric industry (Jan 1985 - Oct 1996.

Usage

```
uselec
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 7.8.

Examples

```
plot(uselec)
seasonplot(uselec)
tsdisplay(uselec)
```

`ustreas` *Treasury bill contracts*

Description

US treasury bill contracts on the Chicago market for 100 consecutive trading days in 1981.

Usage

```
ustreas
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 1.

Examples

```
plot(ustreas)
tsdisplay(ustreas)
```

`wagesuk` *Real daily wages*

Description

Real daily wages in pound, England: 1260–1994.

Usage

```
wagesuk
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
plot(wagesuk)
```

`wheat` *Wheat prices*

Description

Wheat prices in constant 1996 pounds: 1264–1996.

Usage

```
wheat
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 9.

Examples

```
plot(wheat)
```

`wn` *White noise series*

Description

White noise series.

Usage

```
wn
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Exercise 7.3.

Examples

```
tsdisplay(wn)
```

`wnoise` *White noise time series*

Description

White noise time series with 36 values.

Usage

```
wnoise
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chpater 7.

Examples

```
tsdisplay(wnoise)
```

`writing` *Sales of printing and writing paper*

Description

Industry sales for printing and writing paper (in thousands of French francs): Jan 1963 – Dec 1972.

Usage

```
writing
```

Format

Time series data

Source

Makridakis, Wheelwright and Hyndman (1998) *Forecasting: methods and applications*, John Wiley & Sons: New York. Chapter 7.

Examples

```
tsdisplay(writing)
seasonplot(writing)
```

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