Package ‘HSAUR’

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`A Handbook of Statistical Analyses Using R’ (Brian S. Everitt and Torsten
Hothorn, Chapman & Hall/CRC, 2006). The first chapter
of the book, which is entitled ‘An Introduction to R’,
is completely included in this package, for all other chapters,
a vignette containing all data analyses is available.

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agefat                      Total Body Composition Data

Description

Age and body fat percentage of 25 normal adults.
Usage
data("agefat")

Format
A data frame with 25 observations on the following 3 variables.

age  the age of the subject.
fat  the body fat percentage.
sex  a factor with levels female and male.

Details
The data come from a study investigating a new methods of measuring body composition (see Mazess et al, 1984), and give the body fat percentage (percent fat), age and sex for 25 normal adults aged between 23 and 61 years. The questions of interest are how are age and percent fat related, and is there any evidence that the relationship is different for males and females.

Source

Examples

data("agefat", package = "HSAUR")
plot(fat ~ age, data = agefat)

---

**aspirin**  
**Aspirin Data**

Description
Efficacy of Aspirin in preventing death after a myocardial infarct.

Usage
data("aspirin")

Format
A data frame with 7 observations on the following 4 variables.

dp  number of deaths after placebo.
tp  total number subjects treated with placebo.
da  number of deaths after Aspirin.
ta  total number of subjects treated with Aspirin.
Details

The data were collected for a meta-analysis of the effectiveness of Aspirin (versus placebo) in preventing death after a myocardial infarction.

Source


Examples

```
data("aspirin", package = "HSAUR")
aspirin
```

---

### BCG Vaccine Data

**Description**

A meta-analysis on the efficacy of BCG vaccination against tuberculosis (TB).

**Usage**

```
data("BCG")
```

**Format**

A data frame with 13 observations on the following 7 variables.

- **Study** an identifier of the study.
- **BCGTB** the number of subjects suffering from TB after a BCG vaccination.
- **BCGVacc** the number of subjects with BCG vaccination.
- **Novacctb** the number of subjects suffering from TB without BCG vaccination.
- **Novacc** the total number of subjects without BCG vaccination.
- **Latitude** geographic position of the place the study was undertaken.
- **Year** the year the study was undertaken.

**Details**

Bacille Calmette Guerin (BCG) is the most widely used vaccination in the world. Developed in the 1930s and made of a live, weakened strain of Mycobacterium bovis, the BCG is the only vaccination available against tuberculosis today. Colditz et al. (1994) report data from 13 clinical trials of BCG vaccine each investigating its efficacy in the treatment of tuberculosis. The number of subjects suffering from TB with or without BCG vaccination are given here. In addition, the data contains the values of two other variables for each study, namely, the geographic latitude of the place where the study was undertaken and the year of publication. These two variables will be used to investigate and perhaps explain any heterogeneity among the studies.
Source

Examples
```r
data("BCG", package = "HSAUR")
boxplot(BCG$BCGTB/BCG$BCGVacc, BCG$NoVaccTB/BCG$NoVacc,
      names = c("BCG Vaccination", "No Vaccination"),
      ylab = "Percent BCG cases")
```

birthdeathrates

Birth and Death Rates Data

Description
Birth and death rates for 69 countries.

Usage
```r
data("birthdeathrates")
```

Format
A data frame with 69 observations on the following 2 variables.

- birth birth rate.
- death death rate.

Source

Examples
```r
data("birthdeathrates", package = "HSAUR")
plot(birthdeathrates)
```
**Description**

Data arise from 31 male patients who have been treated for superficial bladder cancer, and give the number of recurrent tumours during a particular time after the removal of the primary tumour, along with the size of the original tumour.

**Usage**

```r
data("bladdercancer")
```

**Format**

A data frame with 31 observations on the following 3 variables.

- `time` the duration.
- `tumorsize` a factor with levels `<3cm` and `>3cm`.
- `number` number of recurrent tumours.

**Details**

The aim is to estimate the effect of size of tumour on the number of recurrent tumours.

**Source**


**Examples**

```r
data("bladdercancer", package = "HSAUR")
mosaicplot(xtabs(~ number + tumorsize, data = bladdercancer))
```
Beat the Blues Data

Description

Data from a clinical trial of an interactive multimedia program called ‘Beat the Blues’.

Usage

data("BtheB")

Format

A data frame with 100 observations of 100 patients on the following 8 variables.

- **drug**: did the patient take anti-depressant drugs (No or Yes).
- **length**: the length of the current episode of depression, a factor with levels <6m (less than six months) and >6m (more than six months).
- **treatment**: treatment group, a factor with levels TAU (treatment as usual) and BtheB (Beat the Blues).
- **bdi.pre**: Beck Depression Inventory II before treatment.
- **bdi.2m**: Beck Depression Inventory II after two months.
- **bdi.4m**: Beck Depression Inventory II after four months.
- **bdi.6m**: Beck Depression Inventory II after six months.
- **bdi.8m**: Beck Depression Inventory II after eight months.

Details

Longitudinal data from a clinical trial of an interactive, multimedia program known as "Beat the Blues" designed to deliver cognitive behavioural therapy to depressed patients via a computer terminal. Patients with depression recruited in primary care were randomised to either the Beating the Blues program, or to "Treatment as Usual (TAU)".

Note that the data are stored in the wide form, i.e., repeated measurements are represented by additional columns in the data frame.

Source

clouds

Cloud Seeding Data

Data from an experiment investigating the use of massive amounts of silver iodide (100 to 1000 grams per cloud) in cloud seeding to increase rainfall.

Usage

data("clouds")

Format

A data frame with 24 observations on the following 7 variables.

- **seeding**  a factor indicating whether seeding action occurred (no or yes).
- **time**  number of days after the first day of the experiment.
- **sne**  suitability criterion.
- **cloudcover**  the percentage cloud cover in the experimental area, measured using radar.
- **prewetness**  the total rainfall in the target area one hour before seeding (in cubic metres times 1e+8).
- **echomotion**  a factor showing whether the radar echo was moving or stationary.
- **rainfall**  the amount of rain in cubic metres times 1e+8.

Details

Weather modification, or cloud seeding, is the treatment of individual clouds or storm systems with various inorganic and organic materials in the hope of achieving an increase in rainfall. Introduction of such material into a cloud that contains supercooled water, that is, liquid water colder than zero Celsius, has the aim of inducing freezing, with the consequent ice particles growing at the expense of liquid droplets and becoming heavy enough to fall as rain from clouds that otherwise would produce none.

Examples

data("BtheB", package = "HSAUR")
ylim <- range(BtheB[, grep("bdi", names(BtheB))], na.rm = TRUE)
boxplot(subset(BtheB, treatment == "TAU"),[, grep("bdi", names(BtheB))],
       main = "Treated as usual", ylab = "BDI",
xlab = "Time (in months)", names = c(0, 2, 4, 6, 8), ylim = ylim)
boxplot(subset(BtheB, treatment == "BtheB"),[, grep("bdi", names(BtheB))],
       main = "Beat the Blues", ylab = "BDI",
xlab = "Time (in months)",
       names = c(0, 2, 4, 6, 8), ylim = ylim)
The data available in cloud were collected in the summer of 1975 from an experiment to investigate the use of massive amounts of silver iodide (100 to 1000 grams per cloud) in cloud seeding to increase rainfall. In the experiment, which was conducted in an area of Florida, 24 days were judged suitable for seeding on the basis that a measured suitability criterion (SNE).

Source


Examples

```r
data("clouds", package = "HSAUR")
layout(matrix(1:2, nrow = 2))
boxplot(rainfall ~ seeding, data = clouds, ylab = "Rainfall")
boxplot(rainfall ~ echomotion, data = clouds, ylab = "Rainfall")
```

---

**CYGOB1**

**CYG OB1 Star Cluster Data**

**Description**

Energy output and surface temperature for Star Cluster CYG OB1.

**Usage**

```r
data("CYGOB1")
```

**Format**

A data frame with 47 observations on the following 2 variables.

- `logst` log surface temperature of the star.
- `logli` log light intensity of the star.

**Details**

The Hertzsprung-Russell (H-R) diagram forms the basis of the theory of stellar evolution. The diagram is essentially a plot of the energy output of stars plotted against their surface temperature. Data from the H-R diagram of Star Cluster CYG OB1, calibrated according to VanismaGreve1972 are given here.
Source

Examples

```r
data("CYG0B1", package = "HSAUR")
plot(logst ~ logli, data = CYG0B1)
```

<table>
<thead>
<tr>
<th>epilepsy</th>
<th>Epilepsy Data</th>
</tr>
</thead>
</table>

Description
A randomised clinical trial investigating the effect of an anti-epileptic drug.

Usage
`data("epilepsy")`

Format
A data frame with 236 observations on the following 6 variables.

- **treatment**: the treatment group, a factor with levels placebo and Progabide.
- **base**: the number of seizures before the trial.
- **age**: the age of the patient.
- **seizure.rate**: the number of seizures (response variable).
- **period**: treatment period, an ordered factor with levels 1 to 4.
- **subject**: the patient ID, a factor with levels 1 to 59.

Details
In this clinical trial, 59 patients suffering from epilepsy were randomized to groups receiving either the anti-epileptic drug Progabide or a placebo in addition to standard chemotherapy. The numbers of seizures suffered in each of four, two-week periods were recorded for each patient along with a baseline seizure count for the 8 weeks prior to being randomized to treatment and age. The main question of interest is whether taking progabide reduced the number of epileptic seizures compared with placebo.
Source


Examples

data("epilepsy", package = "HSAUR")
library(lattice)
dotplot(I(seizure.rate / base) ~ period | subject, data = epilepsy, 
  subset = treatment == "Progabide")
dotplot(I(seizure.rate / base) ~ period | subject, data = epilepsy, 
  subset = treatment == "Progabide")

---

Forbes2000


Description

The Forbes 2000 list is a ranking of the world’s biggest companies, measured by sales, profits, assets and market value.

Usage

data("Forbes2000")

Format

A data frame with 2000 observations on the following 8 variables.

- **rank**  the ranking of the company.
- **name**  the name of the company.
- **country**  a factor giving the country the company is situated in.
- **category**  a factor describing the products the company produces.
- **sales**  the amount of sales of the company in billion USD.
- **profits**  the profit of the company in billion USD.
- **assets**  the assets of the company in billion USD.
- **marketvalue**  the market value of the company in billion USD.

Source

Examples

data("Forbes2000", package = "HSAUR")
summary(Forbes2000)
### number of countries
length(levels(Forbes2000$country))
### number of industries
length(levels(Forbes2000$category))

---

foster  

_Foster Feeding Experiment_

Description

The data are from a foster feeding experiment with rat mothers and litters of four different genotypes. The measurement is the litter weight after a trial feeding period.

Usage

data("foster")

Format

A data frame with 61 observations on the following 3 variables.

- **litgen**: genotype of the litter, a factor with levels A, B, I, and J.
- **motgen**: genotype of the mother, a factor with levels A, B, I, and J.
- **weight**: the weight of the litter after a feeding period.

Details

Here the interest lies in uncovering the effect of genotype of mother and litter on litter weight.

Source


Examples

data("foster", package = "HSAUR")
plot.design(foster)
gardenflowers

<table>
<thead>
<tr>
<th>gardenflowers</th>
<th>Garden Flowers</th>
</tr>
</thead>
</table>

**Description**

The dissimilarity matrix of 18 species of garden flowers.

**Usage**

```r
data("gardenflowers")
```

**Format**

An object of class `dist`.

**Details**

The dissimilarity was computed based on certain characteristics of the flowers.

**Source**


**Examples**

```r
data("gardenflowers", package = "HSAUR")
gardenflowers
```

ghq

<table>
<thead>
<tr>
<th>GHQ</th>
<th>General Health Questionnaire</th>
</tr>
</thead>
</table>

**Description**

Data from an psychiatric screening questionnaire.

**Usage**

```r
data("GHQ")
```
Format

A data frame with 22 observations on the following 4 variables.

GHQ  the General Health Questionnaire score.
sex  a factor with levels female and male
cases  the number of diseased subjects.
non_cases  the number of healthy subjects.

Details

The data arise from a study of a psychiatric screening questionnaire called the GHQ (General Health Questionnaire, see Goldberg, 1972). Here the main question of interest is to see how caseness is related to gender and GHQ score.

Source


Examples

```r
data("GHQ", package = "HSAUR")
male <- subset(GHQ, sex == "male")
female <- subset(GHQ, sex == "female")
layout(matrix(1:2, ncol = 2))
barplot(t(as.matrix(male[,c("cases", "non_cases")]))), main = "Male", xlab = "GHC score")
barplot(t(as.matrix(male[,c("cases", "non_cases")]))), main = "Female", xlab = "GHC score")
```

heptathlon

\textit{Olympic Heptathlon Seoul 1988}

Description


Usage

```r
data("heptathlon")
```
heptathlon

Format

A data frame with 25 observations on the following 8 variables.

hurdles results 100m hurdles.
highjump results high jump.
shot results shot.
run200m results 200m race.
longjump results long jump.
javelin results javelin.
run800m results 800m race.
score total score.

Details

The first combined Olympic event for women was the pentathlon, first held in Germany in 1928. Initially this consisted of the shot putt, long jump, 100m, high jump and javelin events held over two days. The pentathlon was first introduced into the Olympic Games in 1964, when it consisted of the 80m hurdles, shot, high jump, long jump and 200m. In 1977 the 200m was replaced by the 800m and from 1981 the IAAF brought in the seven-event heptathlon in place of the pentathlon, with day one containing the events-100m hurdles, shot, high jump, 200m and day two, the long jump, javelin and 800m. A scoring system is used to assign points to the results from each event and the winner is the woman who accumulates the most points over the two days. The event made its first Olympic appearance in 1984.

In the 1988 Olympics held in Seoul, the heptathlon was won by one of the stars of women’s athletics in the USA, Jackie Joyner-Kersee. The results for all 25 competitors are given here.

Source


Examples

data("heptathlon", package = "HSAUR")
plot(heptathlon)
Description

Generate longtable LaTeX environments.

Usage

HSAURtable(object, ...)  # S3 method for class 'table'
HSAURtable(object, xname = deparse(substitute(object)), pkg = NULL, ...)
  # S3 method for class 'data.frame'
HSAURtable(object, xname = deparse(substitute(object)), pkg = NULL,
   nrows = NULL, ...)
  # S3 method for class 'tabtab'
toLatex(object, caption = NULL, label = NULL,
   topcaption = TRUE, index = TRUE, ...)
  # S3 method for class 'dftab'
toLatex(object, pcol = 1, caption = NULL,
   label = NULL, rownames = FALSE, topcaption = TRUE, index = TRUE,
   ...)

Arguments

object an object of table or data.frame.
xname the name of the object.
pkg the package object comes from, optionally.
nrows the number of rows actually printed for a data.frame.
caption the (optional) caption of the table without label.
label the (optional) label to be defined for this table.
pcol the number of parallel columns.
rownames logical, should the rownames be printed in the first row without column name?
topcaption logical, should the captions be placed on top (default) of the table?
index logical, should an index entry be generated?
... additional arguments, currently ignored.

Details

Based on the data in object, an object from which a Latex table (in a longtable environment) may be constructed (via toLatex) is generated.
Value

An object of class `tabtab` or `dftab` for which `toLatex` methods are available.
`toLatex` produces objects of class `latex`, a character vector, essentially.

Examples

```r
data("rearrests", package = "HSAUR")
toLatex(HSAURtable(rearrests),
    caption = "Rearrests of juvenile felons.",
    label = "rearrests_tab")
```

Description

Data from four randomised clinical trials on the prevention of gastointestinal damages by Misoprostol reported by Lanza et al. (1987, 1988a,b, 1989).

Usage

data("Lanza")

Format

A data frame with 198 observations on the following 3 variables.

- `study` a factor with levels I, II, III, and IV describing the study number.
- `treatment` a factor with levels Misoprostol Placebo
- `classification` an ordered factor with levels 1 < 2 < 3 < 4 < 5 describing an ordered response variable.

Details

The response variable is defined by the number of haemorrhages or erosions.

Source


**Examples**

```r
data("Lanza", package = "HSAUR")
layout(matrix(1:4, nrow = 2))
pl <- tapply(1:nrow(Lanza), Lanza$study, function(indx)
mosaicplot(table(Lanza[indx,"treatment"],
Lanza[indx,"classification"]),
main = "", shade = TRUE))
```

---

**Description**

Survival times in months after mastectomy of women with breast cancer. The cancers are classified as having metastized or not based on a histochemical marker.

**Usage**

```r
data("mastectomy")
```

**Format**

A data frame with 42 observations on the following 3 variables.

- **time**: survival times in months.
- **event**: a logical indicating if the event was observed (TRUE) or if the survival time was censored (FALSE).
- **metastized**: a factor at levels yes and no.

**Source**


**Examples**

```r
data("mastectomy", package = "HSAUR")
table(mastectomy$metastized)
```
Meteorological Measurements for 11 Years

Description

Several meteorological measurements for a period between 1920 and 1931.

Usage

data("meteo")

Format

A data frame with 11 observations on the following 6 variables.

- **year**: the years.
- **rainNovDec**: rainfall in November and December (mm).
- **temp**: average July temperature.
- **rainJuly**: rainfall in July (mm).
- **radiation**: radiation in July (millilitres of alcohol).
- **yield**: average harvest yield (quintals per hectare).

Details

Carry out a principal components analysis of both the covariance matrix and the correlation matrix of the data and compare the results. Which set of components leads to the most meaningful interpretation?

Source


Examples

data("meteo", package = "HSAUR")
meteo
orallesions  Oral Lesions in Rural India

Description

The distribution of the oral lesion site found in house-to-house surveys in three geographic regions of rural India.

Usage

data("orallesions")

Format

A two-way classification, see table.

Source


Examples

data("orallesions", package = "HSAUR")
mosaicplot(orallesions)

phosphate  Phosphate Level Data

Description

Plasma inorganic phosphate levels from 33 subjects.

Usage

data("phosphate")
pistonrings

Format

A data frame with 33 observations on the following 9 variables.

- **group**: a factor with levels control and obese.
- **tP**: baseline phosphate level.
- **tPNU**: phosphate level after 1/2 an hour.
- **t1**: phosphate level after one an hour.
- **t1.5**: phosphate level after 1 1/2 hours.
- **t2**: phosphate level after two hours.
- **t3**: phosphate level after three hours.
- **t4**: phosphate level after four hours.
- **t5**: phosphate level after five hours.

Source


Examples

```r
data("phosphate", package = "HSAUR")
plot(tP ~ group, data = phosphate)
```

---

### pistonrings

**Piston Rings Failures**

Description

Number of failures of piston rings in three legs of four steam-driven compressors.

Usage

```r
data("pistonrings")
```

Format

A two-way classification, see `table`.

Details

The data are given in form of a `table`. The table gives the number of piston-ring failures in each of three legs of four steam-driven compressors located in the same building. The compressors have identical design and are oriented in the same way. The question of interest is whether the two classification variables (compressor and leg) are independent.
### Source


### Examples

```r
data("pistonrings", package = "HSAUR")
mosaicplot(pistonrings)
```

---

<table>
<thead>
<tr>
<th>planets</th>
<th>Exoplanets Data</th>
</tr>
</thead>
</table>

### Description

Data on planets outside the Solar System.

### Usage

```r
data("planets")
```

### Format

A data frame with 101 observations from 101 exoplanets on the following 3 variables.

- **mass**: Jupiter mass of the planet.
- **period**: period in earth days.
- **eccen**: the radial eccentricity of the planet.

### Details

From the properties of the exoplanets found up to now it appears that the theory of planetary development constructed for the planets of the Solar System may need to be reformulated. The exoplanets are not at all like the nine local planets that we know so well. A first step in the process of understanding the exoplanets might be to try to classify them with respect to their known properties.

### Source

plasma

Examples

```r
data("planets", package = "HSAUR")
require("scatterplot3d")
scatterplot3d(log(planets$mass), log(planets$period), log(planets$eccen),
    type = "h", highlight.3d = TRUE, angle = 55,
    scale.y = 0.7, pch = 16)
```

Blood Screening Data

Description

The erythrocyte sedimentation rate and measurements of two plasma proteins (fibrinogen and globulin).

Usage

```r
data("plasma")
```

Format

A data frame with 32 observations on the following 3 variables.

- `fibrinogen`  the fibrinogen level in the blood.
- `globulin`    the globulin level in the blood.
- `esr`         the erythrocyte sedimentation rate, either less or greater 20 mm / hour.

Details

The erythrocyte sedimentation rate (ESR) is the rate at which red blood cells (erythrocytes) settle out of suspension in blood plasma, when measured under standard conditions. If the ESR increases when the level of certain proteins in the blood plasma rise in association with conditions such as rheumatic diseases, chronic infections and malignant diseases, its determination might be useful in screening blood samples taken form people suspected to being suffering from one of the conditions mentioned. The absolute value of the ESR is not of great importance rather it is whether it is less than 20mm/hr since lower values indicate a healthy individual.

The question of interest is whether there is any association between the probability of an ESR reading greater than 20mm/hr and the levels of the two plasma proteins. If there is not then the determination of ESR would not be useful for diagnostic purposes.

Source

Examples

```r
data("plasma", package = "HSAUR")
layout(matrix(1:2, ncol = 2))
boxplot(fibrinogen ~ ESR, data = plasma, varwidth = TRUE)
boxplot(globulin ~ ESR, data = plasma, varwidth = TRUE)
```

---

### Description

Data from a placebo-controlled trial of a non-steroidal anti-inflammatory drug in the treatment of familial adenomatous polyposis (FAP).

### Usage

```r
data("polyps")
```

### Format

A data frame with 20 observations on the following 3 variables.

- **number**: number of colonic polyps at 12 months.
- **treat**: treatment arms of the trial, a factor with levels placebo and drug.
- **age**: the age of the patient.

### Details

Giardiello et al. (1993) and Piantadosi (1997) describe the results of a placebo-controlled trial of a non-steroidal anti-inflammatory drug in the treatment of familial adenomatous polyposis (FAP). The trial was halted after a planned interim analysis had suggested compelling evidence in favour of the treatment. Here we are interested in assessing whether the number of colonic polyps at 12 months is related to treatment and age of patient.

### Source


Data from a placebo-controlled trial of a non-steroidal anti-inflammatory drug in the treatment of familial adenomatous polyposis (FAP).

Usage

```r
data("polyps3")
```

Format

A data frame with 22 observations on the following 5 variables.

- `sex`: a factor with levels female and male.
- `treatment`: a factor with levels placebo and active.
- `baseline`: the baseline number of polyps.
- `age`: the age of the patient.
- `number3m`: the number of polyps after three month.

Details

The data arise from the same study as the `polyps` data. Here, the number of polyps after three months are given.

Source


Examples

```r
data("polyps3", package = "HSAUR")
plot(number3m ~ age, data = polyps3, pch = as.numeric(polyps3$treatment))
legend("topright", legend = levels(polyps3$treatment), pch = 1:2, bty = "n")
```
Romano-British Pottery Data

### Description

Chemical composition of Romano-British pottery.

### Usage

```r
data("pottery")
```

### Format

A data frame with 45 observations on the following 9 chemicals.

- `Al2O3` aluminium trioxide.
- `Fe2O3` iron trioxide.
- `MgO` magnesium oxide.
- `CaO` calcium oxide.
- `Na2O` natrium oxide.
- `K2O` calium oxide.
- `TiO2` titanium oxide.
- `MnO` mangan oxide.
- `BaO` barium oxide.

### Details

The data gives the chemical composition of specimens of Romano-British pottery, determined by atomic absorption spectrophotometry, for nine oxides.

### Source


### Examples

```r
data("pottery", package = "HSAUR")
plot(pottery)
```
## rearrests

### Rearrests of Juvenile Felons

**Description**

Rearrests of juvenile felons by type of court in which they were tried.

**Usage**

```r
data("rearrests")
```

**Format**

A two-way classification, see `table`.

**Details**

The data (taken from Agresti, 1996) arise from a sample of juveniles convicted of felony in Florida in 1987. Matched pairs were formed using criteria such as age and the number of previous offences. For each pair, one subject was handled in the juvenile court and the other was transferred to the adult court. Whether or not the juvenile was rearrested by the end of 1988 was then noted. Here the question of interest is whether the true proportions rearrested were identical for the adult and juvenile court assignments?

**Source**


**Examples**

```r
data("rearrests", package = "HSAUR")
rearrests
```

## respiratory

### Respiratory Illness Data

**Description**

The respiratory status of patients recruited for a randomised clinical multicenter trial.

**Usage**

```r
data("respiratory")
```
Format

A data frame with 555 observations on the following 7 variables.

- centre: the study center, a factor with levels 1 and 2.
- treatment: the treatment arm, a factor with levels placebo and treatment.
- sex: a factor with levels female and male.
- age: the age of the patient.
- status: the respiratory status (response variable), a factor with levels poor and good.
- month: the month, each patient was examined at months 0, 1, 2, 3 and 4.
- subject: the patient ID, a factor with levels 1 to 111.

Details

In each of two centres, eligible patients were randomly assigned to active treatment or placebo. During the treatment, the respiratory status (categorised poor or good) was determined at each of four, monthly visits. The trial recruited 111 participants (54 in the active group, 57 in the placebo group) and there were no missing data for either the responses or the covariates. The question of interest is to assess whether the treatment is effective and to estimate its effect.

Note that the data are in long form, i.e, repeated measurements are stored as additional rows in the data frame.

Source


Examples

```r
data("respiratory", package = "HSAUR")
mosaicplot(xtabs(~ treatment + month + status, data = respiratory))
```

---

```
Students Estimates of Lecture Room Width

<table>
<thead>
<tr>
<th>roomwidth</th>
</tr>
</thead>
</table>

```

Description

Lecture room width estimated by students in two different units.

Usage

```r
data("roomwidth")
```
## Format

A data frame with 113 observations on the following 2 variables.

- `unit` a factor with levels feet and metres.
- `width` the estimated width of the lecture room.

## Details

Shortly after metric units of length were officially introduced in Australia, each of a group of 44 students was asked to guess, to the nearest metre, the width of the lecture hall in which they were sitting. Another group of 69 students in the same room was asked to guess the width in feet, to the nearest foot. The data were collected by Professor T. Lewis and are taken from Hand et al (1994). The main question is whether estimation in feet and in metres gives different results.

## Source


## Examples

```{r}
data("roomwidth", package = "HSAUR")
convert <- ifelse(roomwidth$unit == "feet", 1, 3.28)
boxplot(I(width * convert) ~ unit, data = roomwidth)
```

## schizophrenia

### Age of Onset of Schizophrenia Data

#### Description

Data on sex differences in the age of onset of schizophrenia.

#### Usage

```{r}
data("schizophrenia")
```

#### Format

A data frame with 251 observations on the following 2 variables.

- `age` age at the time of diagnosis.
- `gender` a factor with levels female and male
Details

A sex difference in the age of onset of schizophrenia was noted by Kraepelin (1919). Subsequently epidemiological studies of the disorder have consistently shown an earlier onset in men than in women. One model that has been suggested to explain this observed difference is know as the subtype model which postulates two type of schizophrenia, one characterised by early onset, typical symptoms and poor premorbid competence, and the other by late onset, atypical symptoms, and good premorbid competence. The early onset type is assumed to be largely a disorder of men and the late onset largely a disorder of women.

Source


Examples

data("schizophrenia", package = "HSAUR")
boxplot(age ~ gender, data = schizophrenia)

schizophrenia2 Schizophrenia Data

Description

Though disorder and early onset of schizophrenia.

Usage

data("schizophrenia2")

Format

A data frame with 220 observations on the following 4 variables.

subject the patient ID, a factor with levels 1 to 44.
onset the time of onset of the disease, a factor with levels < 20 yrs and > 20 yrs.
disorder whether thought disorder was absent or present, the response variable.
month month after hospitalisation.

Details

The data were collected in a follow-up study of women patients with schizophrenia. The binary response recorded at 0, 2, 6, 8 and 10 months after hospitalisation was thought disorder (absent or present). The single covariate is the factor indicating whether a patient had suffered early or late onset of her condition (age of onset less than 20 years or age of onset 20 years or above). The question of interest is whether the course of the illness differs between patients with early and late onset?
schooldays

Source


Examples

```r
data("schizophrenia2", package = "HSAUR")
mosaicplot(xtabs(~ onset + month + disorder, data = schizophrenia2))
```

```r
data("schooldays")
```

Description

Data from a sociological study, the number of days absent from school is the response variable.

Usage

data("schooldays")

Format

A data frame with 154 observations on the following 5 variables.

- `race`: race of the child, a factor with levels aboriginal and non-aboriginal.
- `sex`: the sex of the child, a factor with levels female and male.
- `school`: the school type, a factor with levels F0 (primary), F1 (first), F2 (second) and F3 (third form).
- `learner`: how good is the child in learning things, a factor with levels average and slow.
- `absent`: number of days absent from school.

Details

The data arise from a sociological study of Australian Aboriginal and white children reported by Quine (1975).

In this study, children of both sexes from four age groups (final grade in primary schools and first, second and third form in secondary school) and from two cultural groups were used. The children in age group were classified as slow or average learners. The response variable was the number of days absent from school during the school year. (Children who had suffered a serious illness during the years were excluded.)

Source

**Examples**

```
data("schooldays", package = "HSAUR")
plot.design(schooldays)
```

---

**skulls**

**Egyptian Skulls**

**Description**

Measurements made on Egyptian skulls from five epochs.

**Usage**

```
data("skulls")
```

**Format**

A data frame with 150 observations on the following 5 variables.

- `epoch` the epoch the skull as assigned to, a factor with levels `c4000BC`, `c3300BC`, `c1850BC`, `c200BC`, `cAD150`, where the years are only given approximately, of course.
- `mb` maximum breaths of the skull.
- `bh` basibregmatic heights of the skull.
- `bl` basialliveolar length of the skull.
- `nh` nasal heights of the skull.

**Details**

The question is whether the measurements change over time. Non-constant measurements of the skulls over time would indicate interbreeding with immigrant populations.

**Source**


**Examples**

```
data("skulls", package = "HSAUR")
means <- tapply(1:nrow(skulls), skulls$epoch, function(i)
    apply(skulls[i, colnames(skulls)[-1]], 2, mean))
means <- matrix(unlist(means), nrow = length(means), byrow = TRUE)
colnames(means) <- colnames(skulls)[-1]
rownames(means) <- levels(skulls$epoch)
```
pairs(means,
   panel = function(x, y) {
     text(x, y, levels(skulls$epoch))
   })


## smoking

### Nicotine Gum and Smoking Cessation

#### Description

Data from a meta-analysis on nicotine gum and smoking cessation

#### Usage

```
data("smoking")
```

#### Format

A data frame with 26 observations (studies) on the following 4 variables.

- `qt`: the number of treated subjects who stopped smoking.
- `tt`: the total number of treated subjects.
- `qc`: the number of subjects who stopped smoking without being treated.
- `tc`: the total number of subject not being treated.

#### Details

Cigarette smoking is the leading cause of preventable death in the United States and kills more Americans than AIDS, alcohol, illegal drug use, car accidents, fires, murders and suicides combined. It has been estimated that 430,000 Americans die from smoking every year. Fighting tobacco use is, consequently, one of the major public health goals of our time and there are now many programs available designed to help smokers quit. One of the major aids used in these programs is nicotine chewing gum, which acts as a substitute oral activity and provides a source of nicotine that reduces the withdrawal symptoms experienced when smoking is stopped. But separate randomized clinical trials of nicotine gum have been largely inconclusive, leading Silagy (2003) to consider combining the results studies found from an extensive literature search. The results of these trials in terms of numbers of people in the treatment arm and the control arm who stopped smoking for at least 6 months after treatment are given here.

#### Source

Examples

```r
data("smoking", package = "HSAUR")
boxplot(smoking$qt/smoking$tt,
       smoking$qc/smoking$tc,
       names = c("Treated", "Control"), ylab = "Percent Quitters")
```

---

Description

Students were administered two parallel forms of a test after a random assignment to three different treatments.

Usage

```r
data("students")
```

Format

A data frame with 35 observations on the following 3 variables.

- `treatment` a factor with levels AA, C, and NC.
- `low` the result of the first test.
- `high` the result of the second test.

Details

The data arise from a large study of risk taking (Timm, 2002). Students were randomly assigned to three different treatments labelled AA, C and NC. Students were administered two parallel forms of a test called low and high. The aim is to carry out a test of the equality of the bivariate means of each treatment population.

Source


Examples

```r
data("students", package = "HSAUR")
layout(matrix(1:2, ncol = 2))
boxplot(low ~ treatment, data = students, ylab = "low")
boxplot(high ~ treatment, data = students, ylab = "high")
```
suicides

Crowd Baiting Behaviour and Suicides

Description

Data from a study carried out to investigate the causes of jeering or baiting behaviour by a crowd when a person is threatening to commit suicide by jumping from a high building.

Usage

data("suicides")

Format

A two-way classification, see table.

Source


Examples

data("suicides", package = "HSAUR")
mosaicplot(suicides)

---

toothpaste

Toothpaste Data

Description

Meta-analysis of studies comparing two different toothpastes.

Usage

data("toothpaste")
Format

A data frame with 9 observations on the following 7 variables.

study  the identifier of the study.
nA  number of subjects using toothpaste A.
meanA  mean DMFS index of subjects using toothpaste A.
sdA  standard deviation of DMFS index of subjects using toothpaste A.
nB  number of subjects using toothpaste B.
meanB  mean DMFS index of subjects using toothpaste B.
sdB  standard deviation of DMFS index of subjects using toothpaste B.

Details

The data are the results of nine randomised trials comparing two different toothpastes for the prevention of caries development. The outcomes in each trial was the change, from baseline, in the decayed, missing (due to caries) and filled surface dental index (DMFS).

Source


Examples

data("toothpaste", package = "HSAUR")
toothpaste

data("voting")

Description

Voting results for 15 congressmen from New Jersey.

Usage

data("voting")

Format

A 15 times 15 matrix.
Details

Romesburg (1984) gives a set of data that shows the number of times 15 congressmen from New Jersey voted differently in the House of Representatives on 19 environmental bills. Abstentions are not recorded.

Source


Examples

data("voting", package = "HSAUR")
require("MASS")
voting_mds <- isoMDS(voting)
plot(voting_mds$points[,1], voting_mds$points[,2],
     type = "n", xlab = "Coordinate 1", ylab = "Coordinate 2",
     xlim = range(voting_mds$points[,1])*1.2)
text(voting_mds$points[,1], voting_mds$points[,2],
     labels = colnames(voting))
voting_sh <- Shepard(voting[lower.tri(voting)], voting_mds$points)

water

<table>
<thead>
<tr>
<th>water</th>
<th>Mortality and Water Hardness</th>
</tr>
</thead>
</table>

Description

The mortality and drinking water hardness for 61 cities in England and Wales.

Usage

data("water")

Format

A data frame with 61 observations on the following 4 variables.

- **location** a factor with levels North and South indicating whether the town is as north as Derby.
- **town** the name of the town.
- **mortality** averaged annual mortality per 100,000 male inhabitants.
- **hardness** calcium concentration (in parts per million).
Details
The data were collected in an investigation of environmental causes of disease. They show the annual mortality per 100,000 for males, averaged over the years 1958-1964, and the calcium concentration (in parts per million) in the drinking water for 61 large towns in England and Wales. The higher the calcium concentration, the harder the water. Towns at least as far north as Derby are identified in the table. Here there are several questions that might be of interest including, are mortality and water hardness related, and do either or both variables differ between northern and southern towns?

Source

Examples
```r
data("water", package = "HSAUR")
plot(mortality ~ hardness, data = water,
     col = as.numeric(water$location))
```

watervoles  Water Voles Data

Description
Percentage incidence of the 13 characteristics of water voles in 14 areas.

Usage
data("watervoles")

Format
A dissimilarity matrix for the following 14 variables, i.e, areas: Surrey, Shropshire, Yorkshire, Perthshire, Aberdeen, Elean Gamhna, Alps, Yugoslavia, Germany, Norway, Pyrenees I, Pyrenees II, North Spain, and South Spain.

Details
Corbet et al. (1970) report a study of water voles (genus Arvicola) in which the aim was to compare British populations of these animals with those in Europe, to investigate whether more than one species might be present in Britain. The original data consisted of observations of the presence or absence of 13 characteristics in about 300 water vole skulls arising from six British populations and eight populations from the rest of Europe. The data are the percentage incidence of the 13 characteristics in each of the 14 samples of water vole skulls.
Source


Examples

```r
data("watervoles", package = "HSAUR")
watervoles
```

---

Description

Measurements of root mean square bending moment by two different mooring methods.

Usage

```r
data("waves")
```

Format

A data frame with 18 observations on the following 2 variables.

- `method1` Root mean square bending moment in Newton metres, mooring method 1
- `method2` Root mean square bending moment in Newton metres, mooring method 2

Details

In a design study for a device to generate electricity from wave power at sea, experiments were carried out on scale models in a wave tank to establish how the choice of mooring method for the system affected the bending stress produced in part of the device. The wave tank could simulate a wide range of sea states and the model system was subjected to the same sample of sea states with each of two mooring methods, one of which was considerably cheaper than the other. The question of interest is whether bending stress differs for the two mooring methods.

Source


Examples

```r
data("waves", package = "HSAUR")
plot(method1 ~ method2, data = waves)
```
Description

The data arise from an experiment to study the gain in weight of rats fed on four different diets, distinguished by amount of protein (low and high) and by source of protein (beef and cereal).

Usage

data("weightgain")

Format

A data frame with 40 observations on the following 3 variables.

source  source of protein given, a factor with levels Beef and Cereal.
type  amount of protein given, a factor with levels High and Low.
weightgain  weight gain in grams.

Details

Ten rats are randomized to each of the four treatments. The question of interest is how diet affects weight gain.

Source


Examples

data("weightgain", package = "HSAUR")
interaction.plot(weightgain$type, weightgain$source, weightgain$weightgain)
womensrole

Womens Role in Society

Description
Data from a survey from 1974 / 1975 asking both female and male responders about their opinion on the statement: Women should take care of running their homes and leave running the country up to men.

Usage
data("womensrole")

Format
A data frame with 42 observations on the following 4 variables.

education years of education.
sex a factor with levels Male and Female.
agree number of subjects in agreement with the statement.
disagree number of subjects in disagreement with the statement.

Details
The data are from Haberman (1973) and also given in Collett (2003). The questions here are whether the response of men and women differ.

Source

Examples
```r
  data("womensrole", package = "HSAUR")
  summary(subset(womensrole, sex == "Female"))
  summary(subset(womensrole, sex == "Male"))
```
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