Package 'rencher'

May 26, 2025

Title Datasets from the Book ``Methods of Multivariate Analysis (3rd)''

Version 0.1.3

Description Provides the datasets in the book ``Methods of Multivariate Analysis (3rd)'', such as Table 6.27 Blood Pressure Data, for statistical analysis,especially MANOVA. The dataset names correspond to their numbering in the third edition of the book, such as table6.27. Based on the book by Rencher and Christensen (2012, ISBN:9780470178966).

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Contents

`table10.1` *Table 10.1 Chemical Reaction Data*

Description

The results of a planned experiment involving a chemical reaction are given in Table 10.1

Usage

```
table10.1
```

Format

A dataframe with 19 rows and 7 columns.

ExperimentNumber

y1 percentage of unchanged starting material

y2 percentage converted to the desired product

y3 percentage of unwanted by-product

x1 temperature

x2 concentration

x3 time

Source

The data in Table 8.3 were collected by Box and Youle (1955)

`table13.1` *Table 13.1*

Description

Perception Data: Ratings on Five Adjectives for Seven People

Usage

```
table13.1
```

Format

A dataframe with 7 rows and 6 columns.

People

Kind Adjective

Intelligent Adjective

Happy Adjective

Likeable Adjective

Just Adjective

Source

The data in Table 13.1 from METHODS OF MULTIVARIATE ANALYSIS (Third Edition)

table15.1 *Table 15.1 City Crime Rates per 100,000 Population*

Description

Table 15.1 City Crime Rates per 100,000 Population

Usage

```
table15.1
```

Format

A dataframe with 16 rows and 8 columns.

City

Murder A type of crime

Rape A type of crime

Robbery A type of crime

Assault A type of crime

Burglary A type of crime

Larceny A type of crime

AutoTheft A type of crime

Source

The data in Table 15.1 were collected by Hartigan (1975)

table15.13 *Table 15.13 Air Pollution Levels in US Cities*

Description

Table 15.13 Air Pollution Levels in US Cities

Usage

```
table15.13
```

Format

A dataframe with 41 rows and 8 columns.

Cities 41 US cities

y1 SO2 content of air in micrograms per cubic meter

y2 Average annual temperature in °F

y3 Number of manufacturing enterprises employing 20 or more workers

y4 Population size (1970 census) in thousands

y5 Average annual wind speed in miles per hour

y6 Average annual precipitation in inches

y7 Average number of days with precipitation per year

Source

The data in Table 15.8 were collected by Sokal and Rohlf (1981, p. 619)

`table15.14` *Table 15.14 Yields of Winter Wheat (kg per unit area)*

Description

Table 15.14 gives the yields of winter wheat in each of the years 1970-1973 at twelve different sites in England

Usage

```
table15.14
```

Format

A dataframe with 12 rows and 5 columns.

Site twelve different sites in England

y_1970 year 1970

y_1971 year 1971

y_1972 year 1972

y_1973 year 1973

Source

The data in Table 15.14 were collected by (Hand et al. 1994, p. 31)

table15.7 *Table 15.7 Protein Data*

Description

Protein consumption in twenty-five European countries for nine food groups is given in Table 15.7

Usage

```
table15.7
```

Format

A dataframe with 25 rows and 10 columns.

Country

RedMeat

WhiteMeat

Eggs

Milk

Fish

Cereals

StarchyFoods

Nuts

Fruit/Veg

Source

The data in Table 15.7 were collected by Hand et al. (1994, p. 298)

table16.1 *Table 16.1 Airline Distances Between Ten US Cities*

Description

Table 16.1 Airline Distances Between Ten US Cities

Usage

```
table16.1
```

Format

A dataframe with 10 rows and 11 columns.

City
Atlanta
Chicago
Denver
Houston
LosAngeles
Miami
NewYork
SanFrancisco
Seattle
WashingtonDC

Source

The data in Table 15.14 were collected by Kruskal and Wish (1978, pp. 7-9)

`table16.13` *Table 16.13 Do-It-Yourself Data*

Description

Table 16.13 Do-It-Yourself Data

Usage

```
table16.13
```

Format

A dataframe with 24 rows and 7 columns.

AccommodationType Apartment, House
Work Skilled, Unskilled, Office
Tenure Rent, Own
Response Yes, No
Age_1 Up to 30
Age_2 31-45
Age_3 over 45

Source

METHODS OF MULTIVARIATE ANALYSIS (Third Edition)

table16.16 *Table 16.16 Dissimilarity Matrix for World War II Politicians olitician*

Description

Two subjects assessed the degree of dissimilarity between World War II politicians.

Usage

```
table16.16
```

Format

A dataframe with 12 rows and 13 columns.

Person

Hitler

Mussolini

Churchill

Eisenhower

Stalin

Attlee

Franco

DeGaulle

MaoTse

Truman

Chamberlain

Tito

Source

Everitt 1987, Table 6.7

table16.17 *Table 16.17*

Description

Table 16.17 Birth and Death Months of 1281 People

Usage

```
table16.17
```

Format

A dataframe with 12 rows and 13 columns

Birth_Death Birth/Death

Jan month

Feb month

Ma month

Apr month

May month

Jun month

Jul month

Agu month

Sep month

Oct month

Nov month

Dec month

Source

Andrews and Herzberg (1985), Table 71.2

table16.19 *Table 16.19 Byssinosis Data*

Description

Table 16.19 Byssinosis Data

Usage

```
table16.19
```

Format

A dataframe with 48 rows and 8 columns.

Race Other, White

Smoking Non-smoker, Smoker

Gender Female, Male

Years_in_Job

SufferByssi_nosis

High_dust

Low_dust

Med_dust

Source

Andrews and Herzberg (1985, Table 34.1)

table16.8 *Table 16.8 A List of 12 People and Their Categories on Four Variable*

Description

Table 16.8 A List of 12 People and Their Categories on Four Variable

Usage

```
table16.8
```

Format

A dataframe with 12 rows and 5 columns.

Person 12 People

Gender Male, female

Age Young, middle aged, old

MaritalStatus Single, married

HairColor Blond, brown, black, red

Source

METHODS OF MULTIVARIATE ANALYSIS (Third Edition)

`table3.1` *Table 3.1*

Description

Table 3.1 Height and Weight for a Sample of 20 College-Age Males

Usage

```
table3.1
```

Format

A dataframe with 20 rows and 3 columns.

person

x

y

Source

Extracted from Table 3.1 in Rencher (3rd ed.)

`table3.2` *Table 3.2*

Description

Table 3.2 Percentage of Republican Votes in Presidential Elections in Six Southern States for Selected Years

Usage

```
table3.2
```

Format

A dataframe with 6 rows and 6 columns.

State
y_1932
y_1936
y_1940
y_1960
y_1964
y_1968

Source

The data in Table 3.2 are from Kleiner and Hartigan (1981)

`table3.3` *Table 3.4*

Description

Table 3.4 Baker Corn Field Measurements of Yield and Soil Richness

Usage

```
table3.3
```

Format

A dataframe with 10 rows and 4 columns.

LocationNumber
y1
y2
y3

Source

The data set in Table 3.3 contains yield and soil quality measurements at each of 215 locations in a 16-hectare field. The Baker field (Colvin et al., 1997)

`table3.4` *Table 3.4*

Description

Table 3.4 Calcium in Soil and Turnip Greens

Usage

```
table3.4
```

Format

A dataframe with 10 rows and 4 columns

LocationNumber ID

y1 available soil calcium

y2 exchangeable soil calcium

y3 turnip green calcium

Source

Kramer and Jensen (1969)

`table3.5` *Table 3.5*

Description

Table 3.5 Relative Weight, Blood Glucose, and Insulin Levels

Usage

```
table3.5
```

Format

A dataframe with 46 rows and 6 columns.

PatientNumber

y1

y2

x1

x2

x3

Source

Reaven and Miller (1979; see also Andrews and Herzberg 1985, pp. 215-219) measured five variables in a comparison of normal patients and diabetics. In Table 3.5 we give partial data for normal patients only

---

`table3.6` *Table 3.6*

Description

Table 3.6 Response Times for Five Probe Word Positions

Usage

```
table3.6
```

Format

A dataframe with 27 rows and 6 columns.

SubjectNumber ID

y1 The variables are response times for the j_th probe word, y_j,j = 1,2,..., 5

y2 The variables are response times for the j_th probe word, y_j,j = 1,2,..., 5

y3 The variables are response times for the j_th probe word, y_j,j = 1,2,..., 5

y4 The variables are response times for the j_th probe word, y_j,j = 1,2,..., 5

y5 The variables are response times for the j_th probe word, y_j,j = 1,2,..., 5

Source

Timm (1975, p. 233; 1980, p. 47)

table3.7 *Table 3.7*

Description

Table 3.7 Ramus Bone Length at Four Ages for 20 Boys

Usage

```
table3.7
```

Format

A dataframe with 20 rows and 5 columns.

Individual

y1

y2

y3

y4

Source

The data in Table 3.7 (Elston and Grizzle 1962) consist of measurements 2/i 12/27 2/3- an d 2/4 °ft n e ramus bone at four different ages on each of 20 boys

table3.8 *Table 3.8*

Description

Table 3.8 Measurements on the First and Second Adult Sons in a Sample of 25 Families

Usage

```
table3.8
```

Format

A dataframe with 25 rows and 5 columns

Group First, Second

y1 Head Length

y2 Head Breath

x1 Head Length

x2 Head Breath

Source

Frets (1921)

`table4.2` *Table 4.2 Table 4.2 Hematology Data*

Description

Table 4.2 Table 4.2 Hematology Data

Usage

```
table4.2
```

Format

A dataframe with 51 rows and 7 columns

ObservationNumber ID

y1 hemoglobin concentration

y2 packed cell volume

y3 white blood cell count

y4 lymphocyte count

y5 neutrophil count

y6 serum lead concentration

Source

Six hematology variables were measured on 51 workers (Royston 1983)

`table5.1` *Table 5.1*

Description

Table 5.1 Four Psychological Test Scores on 32 Males and 32 Females

Usage

```
table5.1
```

Format

A dataframe with 64 rows and 5 columns.

Group

y1

y2

y3

y4

Source

Four psychological tests were given to 32 men and 32 women. The data are recorded in Table 5.1 (Beall 1945)

`table5.10` *Table 5.10*

Description

Table 5.10 Survival Times for Bronchus Cancer Patients and Matched Controls

Usage

```
table5.10
```

Format

A dataframe with 16 rows and 4 columns

y1 y_1, x_1 = survival time (days) from date of first hospital admission

y2 y_1, x_1 = survival time (days) from date of first hospital admission

x1 y_1, x_1 = survival time (days) from date of first hospital admission

x2 y_1, x_1 = survival time (days) from date of first hospital admission

Source

A number of patients with bronchus cancer were treated with ascorbate and compared with matched patients who received no ascorbate (Cameron and Pauling 1978)

table5.3 *Table 5.3*

Description

Table 5.3 Maximum Depth of Pits and Number of Pits of Coated Pipes

Usage

```
table5.3
```

Format

A dataframe with 15 rows and 7 columns.

Location

y1

y2

x1

x2

d1

d2

Source

Extracted from Table 3.1 in Rencher (3rd ed.)

table5.5 *Table 5.5*

Description

Table 5.5 Four Measurements on Two Species of Flea Beetles

Usage

```
table5.5
```

Format

A dataframe with 39 rows and 6 columns.

Number
Group
y1
y2
y3
y4

Source

Extracted from Table 3.1 in Rencher (3rd ed.)

---

table5.6 *Table 5.6*

Description

Table 5.6 Comparison of Six Tests on Engineer Apprentices and Pilots

Usage

```
table5.6
```

Format

A dataframe with 20 rows and 12 columns.

E_y1
E_y2
E_y3
E_y3
E_y4
E_y5
P_y1
P_y2
P_y3
P_y4
P_y5
P_y6

Source

Extracted from Table 3.1 in Rencher (3rd ed.)

table5.7 *Table 5.7 Comparison of Carriers and Noncarriers of Muscular Dystrophy*

Description

Data from a study comparing carriers and noncarriers of Duchenne muscular dystrophy

Usage

```
table5.7
```

Format

A data frame with 73 rows and 7 variables

Group Group identifier: Carrier or Noncarrier

y1 Biomarker 1 (e.g., enzyme level)

y2 Biomarker 2

y3 Biomarker 3

y4 Biomarker 4

y5 Biomarker 5

y6 Biomarker 6

Source

Andrews and Herzberg (1985), pp. 222–228. Data were collected in an attempt to find a screening procedure to detect carriers of Duchenne muscular dystrophy, a disease transmitted from female carriers to some of their male offspring

table5.8 *Table 5.8*

Description

Table 5.8 Cyclical Measurements of Consumer Goods and Producer Goods

Usage

```
table5.8
```

Format

A dataframe with 19 rows and 6 columns.

Item

Group

y1

y2

y3

y4

Source

Various aspects of economic cycles were measured for consumer goods and producer goods by Tintner (1946)

`table5.9` *Table5.9*

Description

Table 5.9 Number of Words and Number of Verbs

Usage

```
table5.9
```

Format

A dataframe with 15 rows and 7 columns.

Student

y1

y2

x1

x2

d1

d2

Source

Each of 15 students wrote an informal and a formal essay Kramer (1972, p. 100)

table6.16 *Table 6.16*

Description

Table 6.16 Dental Measurements

Usage

```
table6.16
```

Format

A dataframe with 27 rows and 6 columns.

Sex

Subject

y_8

y_10

y_12

y_14

Source

Potthoff and Roy (1964) reported measurements in a dental study on boys and girls from ages 8 to 14. The data are given in Table 6.16

table6.17 *Table 6.17 Judges' Scores on Fish Prepared by Three Methods*

Description

Table 6.17 Judges' Scores on Fish Prepared by Three Methods

Usage

```
table6.17
```

Format

A dataframe with 12 rows and 12 columns

y1_1 aroma
y1_2 flavor
y1_3 texture
y1_4 moisture
y2_1 aroma
y2_2 flavor
y2_3 texture
y2_4 moisture
y3_1 aroma
y3_2 flavor
y3_3 texture
y3_4 moisture

Source

Baten, Tack, and Baeder (1958,p.8)

---

table6.18 *Table 6.18*

Description

Table 6.18 Snap Bean Data

Usage

```
table6.18
```

Format

A dataframe with 60 rows and 7 columns.

S
V
ID
y1
y2
y3
y4

Source

Table 6.18 from Keuls et al. (1984)

table6.19 *Table 6.19*

Description

Table 6.19 Blood Data

Usage

```
table6.19
```

Format

A dataframe with 20 rows and 13 columns.

Subject

R1_y1

R1-y2

R1_y3

R2_y1

R2_y2

R2_y3

R3_y1

R3_y2

R3_y3

Source

In Table 6.19, we have a comparison of four reagents (Burdick 1979)

table6.21 *Table 6.21 Table 6.21 Weights of Cork Borings (eg) in Four Directions for 28 Trees*

Description

Table 6.21 Table 6.21 Weights of Cork Borings (eg) in Four Directions for 28 Trees

Usage

```
table6.21
```

Format

A dataframe with 28 rows and 5 columns

Tree variable 1

N variable 2

E variable 3

S variable 4

W variable 5

Source

Extracted from Table 3.1 in Rencher (3rd ed)

---

table6.22 *Table 6.22 Survival Times for Cancer Patients*

Description

Table 6.22 Survival Times for Cancer Patients

Usage

```
table6.22
```

Format

A dataframe with 63 rows and 7 columns

TypeofCancer 1 = stomach, 2 = bronchus, 3 = colon, 4 — rectum, 5 = bladder, 6 = kidney)

Gender (1 = male, 2 = female

Age Age

y1 survival time (days) of patient treated with ascorbate measured from date of first hospital attendance

y2 mean survival time for the patient's 10 matched controls (untreated with ascorbate)

y3 survival time after ascorbate treatment ceased

y4 mean survival time after all treatment ceased for the patient's 10 matched controls

Source

The data in Table 6.22 were collected by Cameron and Pauling (1978)

table6.23 *Table 6.23*

Description

Table 6.23 Weights of 13 Male Mice Measured at Successive Intervals of 3 Days over 21 Days from Birth to Weaning

Usage

```
table6.23
```

Format

A dataframe with 13 rows and 8 columns

Mouse variable 1

Day3 variable 2

Day6 variable 3

Day9 variable 4

Day12 variable 5

Day15 variable 6

Day18 variable 7

Day21 variable 8

Source

Table 6.23 contains the weights of 13 male mice measured every 3 days from birth to weaning. The data set was reported and analyzed by Williams and Izenman (1981) and by Izenman and Williams (1989) and has been further analyzed by Rao (1984, 1987) and by Lee (1988). Analyze as a one-sample growth curve design

table6.24 *Table 6.24*

Description

In Table 6.24, we have measurements of proportions of albumin at four time points on three groups of trout

Usage

```
table6.24
```

Format

A dataframe with 12 rows and 5 columns.

Group three groups of trout

Time_1 Time Point

Time_2 Time Point

Time_3 Time Point

Time_4 Time Point

Source

The data set was reported by Beauchamp and Hoel (1973)

---

table6.25 *Weekly Gains in Weight for 27 Rats*

Description

Table 6.25 contains weight gains for three groups of rats

Usage

```
table6.25
```

Format

A dataframe with 13 rows and 8 columns.

Group The groups are 1 = controls, 2 = thyroxin added to drinking water, and 3 = thiouracil added to drinking water.

Rat

y1 gain in week 1

y2 gain in week 2

y3 gain in week 3

y4 gain in week 4

Source

The data set was reported by Box (1950)

table6.26 *Coronary Sinus Potassium Measured at 2-Minute Intervals on Dogs Table 6.26 contains measurements of coronary sinus potassium at 2-minute intervals after coronary occlusion on four groups of dogs*

Description

Coronary Sinus Potassium Measured at 2-Minute Intervals on Dogs Table 6.26 contains measurements of coronary sinus potassium at 2-minute intervals after coronary occlusion on four groups of dogs

Usage

```
table6.26
```

Format

A dataframe with 36 rows and 8 columns

Group The groups are 1 = control dogs, 2 = dogs with extrinsic cardiac denervation 3 weeks prior to coronary occlusion, 3 = dogs with extrinsic cardiac denervation immediately prior to coronary occlusion, and 4 = dogs with bilateral thoracic sympathectomy and stellectomy 3 weeks prior to coronary occlusion

Time_1 variable 1

Time_3 variable 2

Time_5 variable 3

Time_7 variable 4

Time_9 variable 5

Time_11 variable 6

Time_13 variable 7

Source

The data set was reported by Grizzle and Allen (1969)

table6.27 *Blood Pressure Data*

Description

Table 6.27 contains blood pressure measurements at intervals after inducing a heart attack for four groups of rats

Usage

```
table6.27
```

Format

A dataframe with 31 rows and 7 columns.

Group group 1 is the controls and groups 2-4 have been exposed to halothane concentrations of .25%, .50%, 1.0%

M_1 Number of Minutes after Ligation

M_5 Number of Minutes after Ligation

M_10 Number of Minutes after Ligation

M_15 Number of Minutes after Ligation

M_30 Number of Minutes after Ligation

M_60 Number of Minutes after Ligation

Source

The data set was reported and by Crepeau et al (1985).

table6.28 *Plasma Inorganic Phosphate (mg/dl)*

Description

Table 6.28 compares 13 control and 20 obese patients on a glucose tolerance test using plasma inorganic phosphate

Usage

```
table6.28
```

Format

A dataframe with 33 rows and 10 columns.

Group Two control and obese groups

M_1 Hours after Glucose Challenge in minutes

M_5 Hours after Glucose Challenge in minutes

M_10 Hours after Glucose Challenge in minutes

M_15 Hours after Glucose Challenge in minutes

M_30 Hours after Glucose Challenge in minutes

M_60 Hours after Glucose Challenge in minutes

Source

The data set was reported and by Zerbe (1979)

`table6.29` *Mandible Measurements*

Description

Table 6.29 contains mandible measurements

Usage

```
table6.29
```

Format

A dataframe with 18 rows and 11 columns.

Group There were two groups of subjects. Each subject was measured at three time points y1, y2 & y3for each of three types of activator treatment

A1_y1 activator 1 subject 1

A1_y2 activator 1 subject 2

A1_y3 activator 1 subject 3

A2_y1 activator 2 subject 1

A2_y2 activator 2 subject 2

A2_y3 activator 2 subject 3

A3_y1 activator 3 subject 1

A3_y2 activator 3 subject 2

A3_y3 activator 3 subject 3

Source

The data set was reported and by Timm (1980)

table6.6 *Table 6.6 Table 6.6 Two-Way Classification of Measurements on Bar Ste*

Description

Table 6.6 Table 6.6 Two-Way Classification of Measurements on Bar Ste

Usage

```
table6.6
```

Format

A dataframe with 16 rows and 5 columns

Lubricant four types

A1_y1 y1 ultimate torque

A1_y2 y2 ultimate strain

A2_y1 y1 ultimate torque

A2_y2 y2 ultimate strain

Source

Table 6.6 contains data reported by Posten (1962) and analyzed by Kramer and Jensen (1970)

table6.8 *Table 6.8 Table 6.8 Weight of Guinea Pigs Under 3 Levels of Vitamin E Supplements*

Description

Table 6.8 Table 6.8 Weight of Guinea Pigs Under 3 Levels of Vitamin E Supplements

Usage

```
table6.8
```

Format

A dataframe with 15 rows and 9 columns

Group variable 1

Animal variable 1

Week_1 variable 1

Week_2 variable 1

Week_3 variable 1

Week_4 variable 1

Week_5 variable 1

Week_6 variable 1

Week_7 variable 1

Source

Three vitamin E diet supplements with levels zero, low, and high were compared for their effect on growth of guinea pigs (Crowder and Hand 1990, pp. 21-29). Five guinea pigs received each supplement level, and their weights were recorded at the end of weeks 1, 3,4, 5, 6, and 7. These weights are given in Table 6.8

---

table7.1 *Seishu Measurements*

Description

Table 7.1 Seishu Measurements

Usage

```
table7.1
```

Format

A dataframe with 30 rows and 10 columns.

y1 taste

y2 odor

x1 PH

x2 acidity 1

x3 acidity 2

x4 sake meter

x5 direct reducing sugar

x6 total sugar

x7 alcohol

x8 formyl-nitrogen

Source

The data set was reported and by Siotani et al. (1963)

`table7.2` *Table 7.2 Temperati, Humidity, and Evaporation*

Description

The data in Table 7.2 relate temperature, humidity, and evaporation

Usage

```
table7.2
```

Format

A dataframe with 46 rows and 11 columns.

y1 maximum daily air temperature

y2 minimum daily air temperature

y3 integrated area under daily air temperature curve, that is, a measure of average air temperature

y4 maximum daily soil temperature

y5 minimum daily soil temperature

y6 integrated area under soil temperature curve

y7 maximum daily relative humidity

y8 minimum daily relative humidity

y9 integrated area under daily humidity curve

y10 total wind, measured in miles per day

y11 evaporation

Source

courtesy of R. J. Freund

table8.1 *Table 8.1*

Description

Samples of steel produced at two different rolling temperatures are compared in Table 8.1

Usage

```
table8.1
```

Format

A dataframe with 12 rows and 3 columns.

Temperatures maximum daily air temperature

y1 yield point

y2 ultimate strength

Source

Kramer and Jensen (1969)

table8.3 *Table 8.3 Head Measurements for Three Groups*

Description

The data in Table 8.3 as part of a preliminary study of a possible link between football helmet design and neck injuries.

Usage

```
table8.3
```

Format

A dataframe with 90 rows and 7 columns.

Group high school football players (group 1), college football players (group 2), and nonfootball players (group 3)

WDIM head width at widest dimension

CIRCUM head circumference

FBEYE front-to-back measurement at eye level

EYEHD eye-to-top-of-head measurement

EARHD ear-to-top-of-head measurement

JAW jaw width

Source

The data in Table 8.3 were collected by G. R. Bryce and R. M. Barker(Brigham Young University)

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