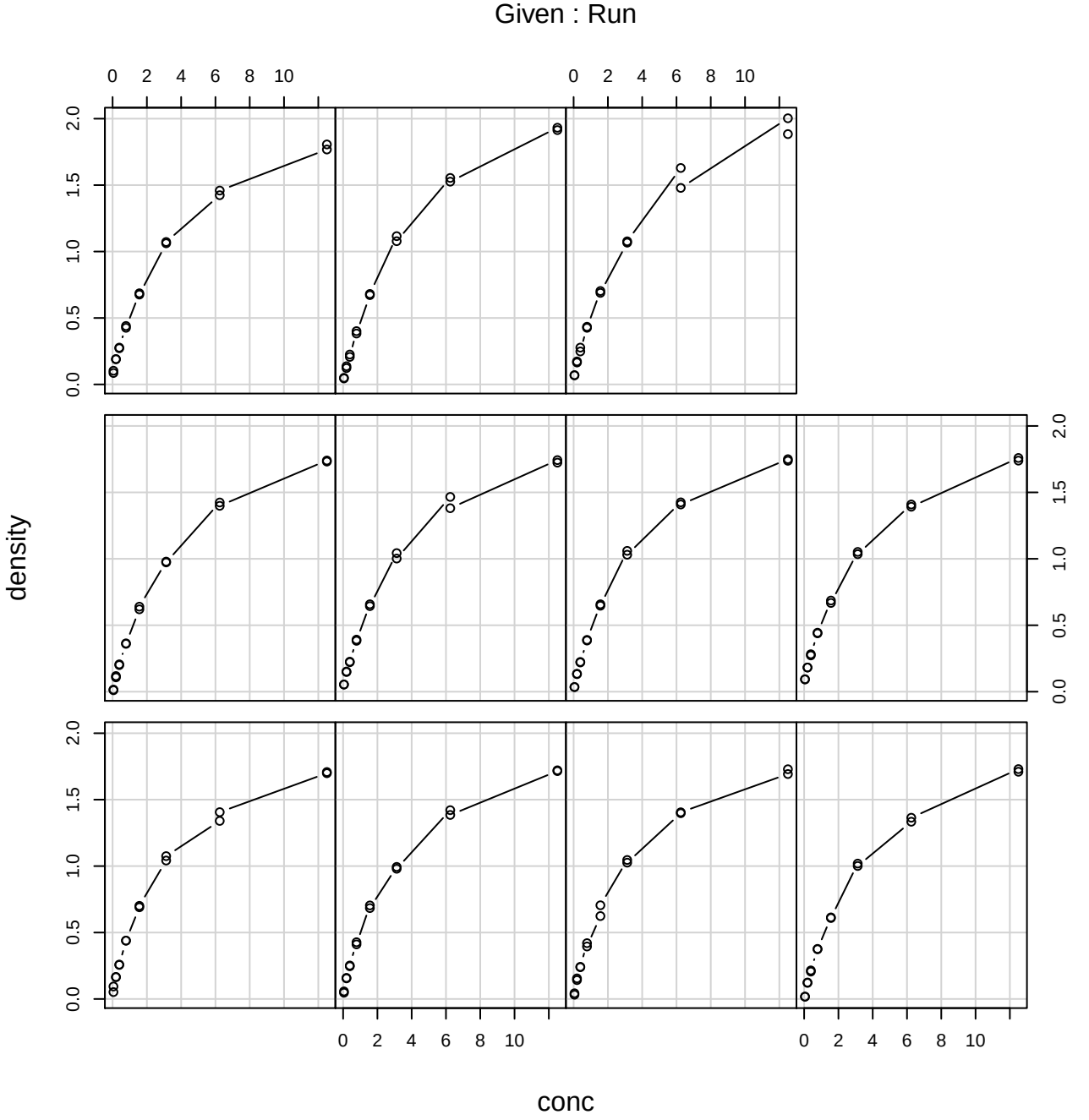
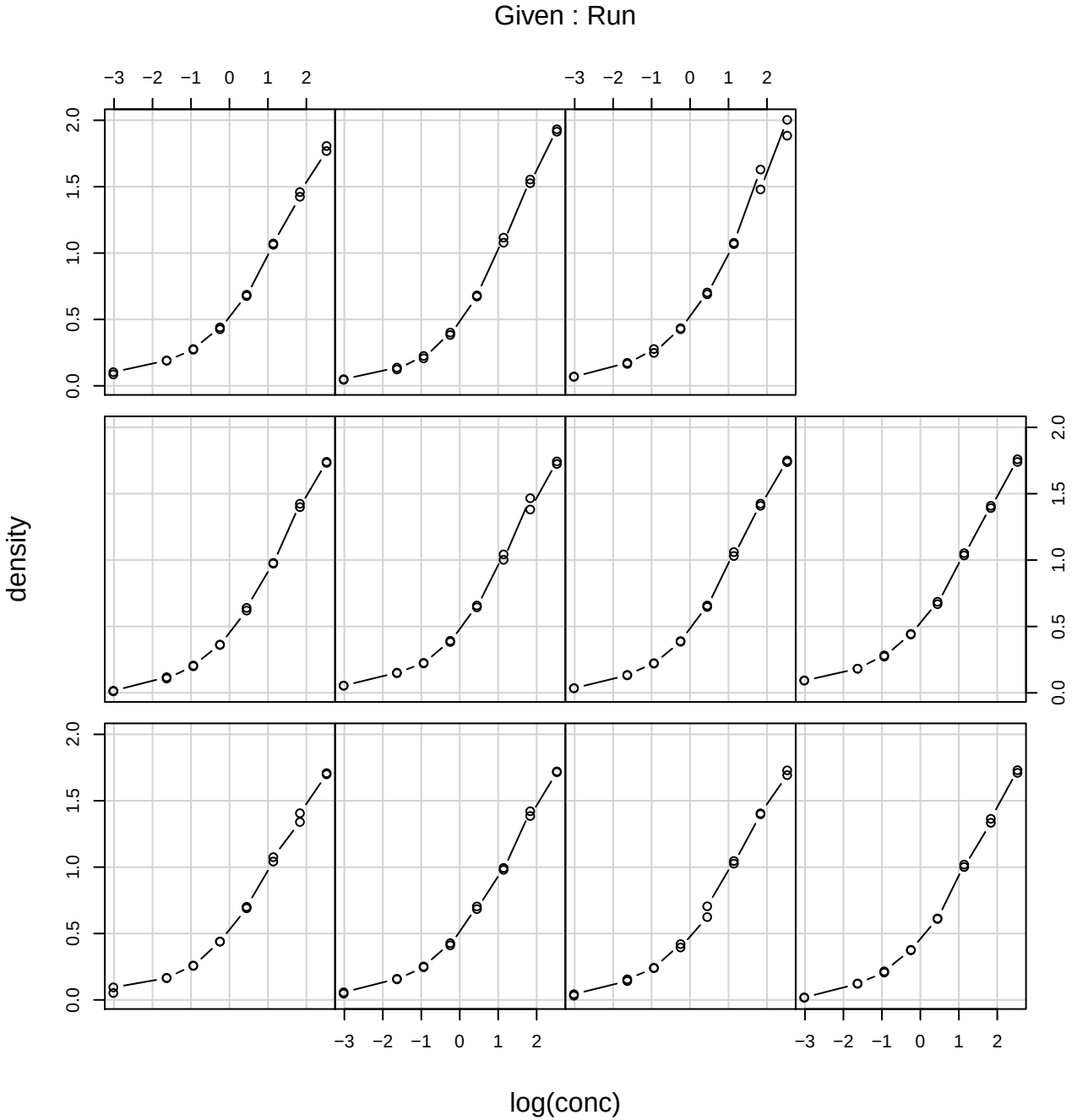
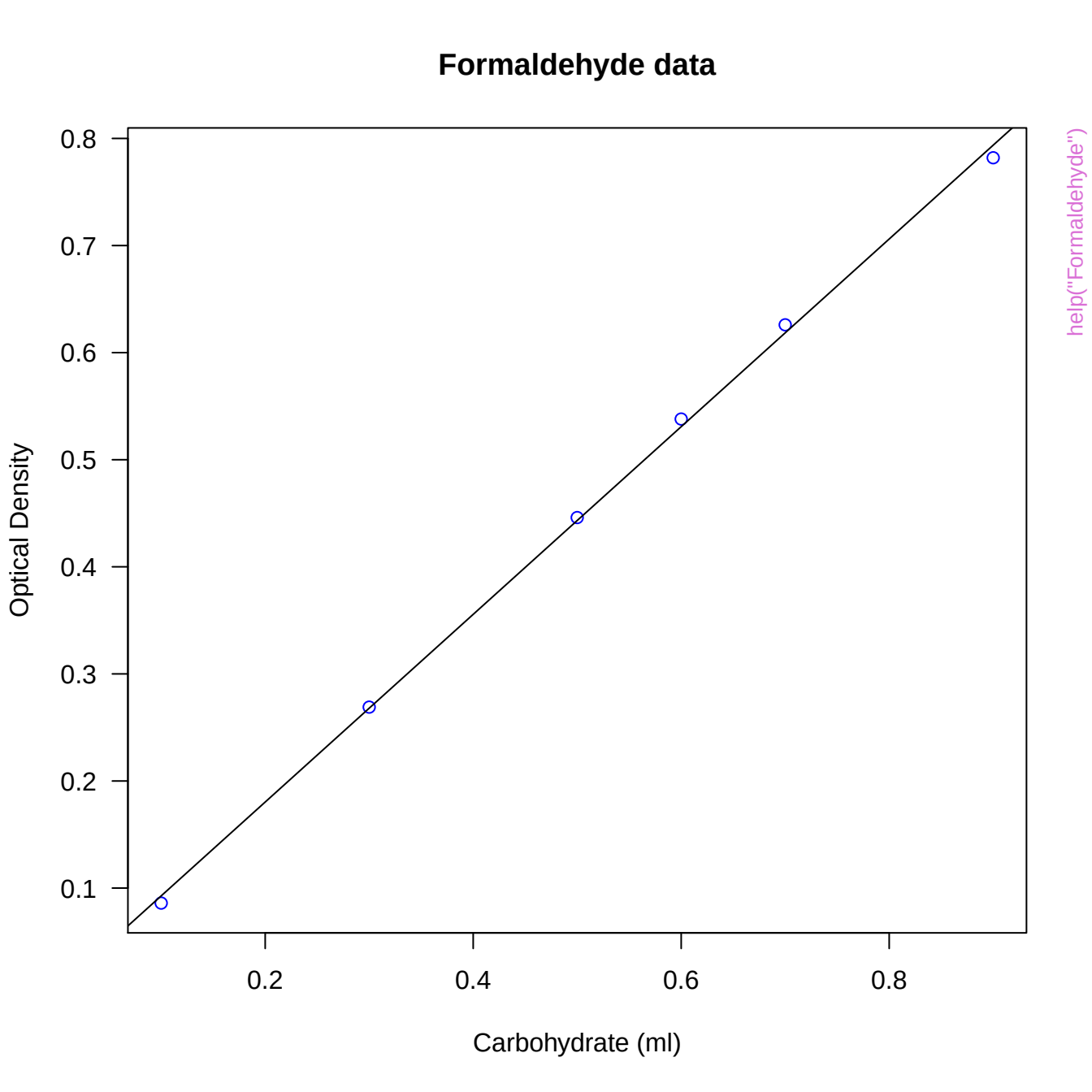
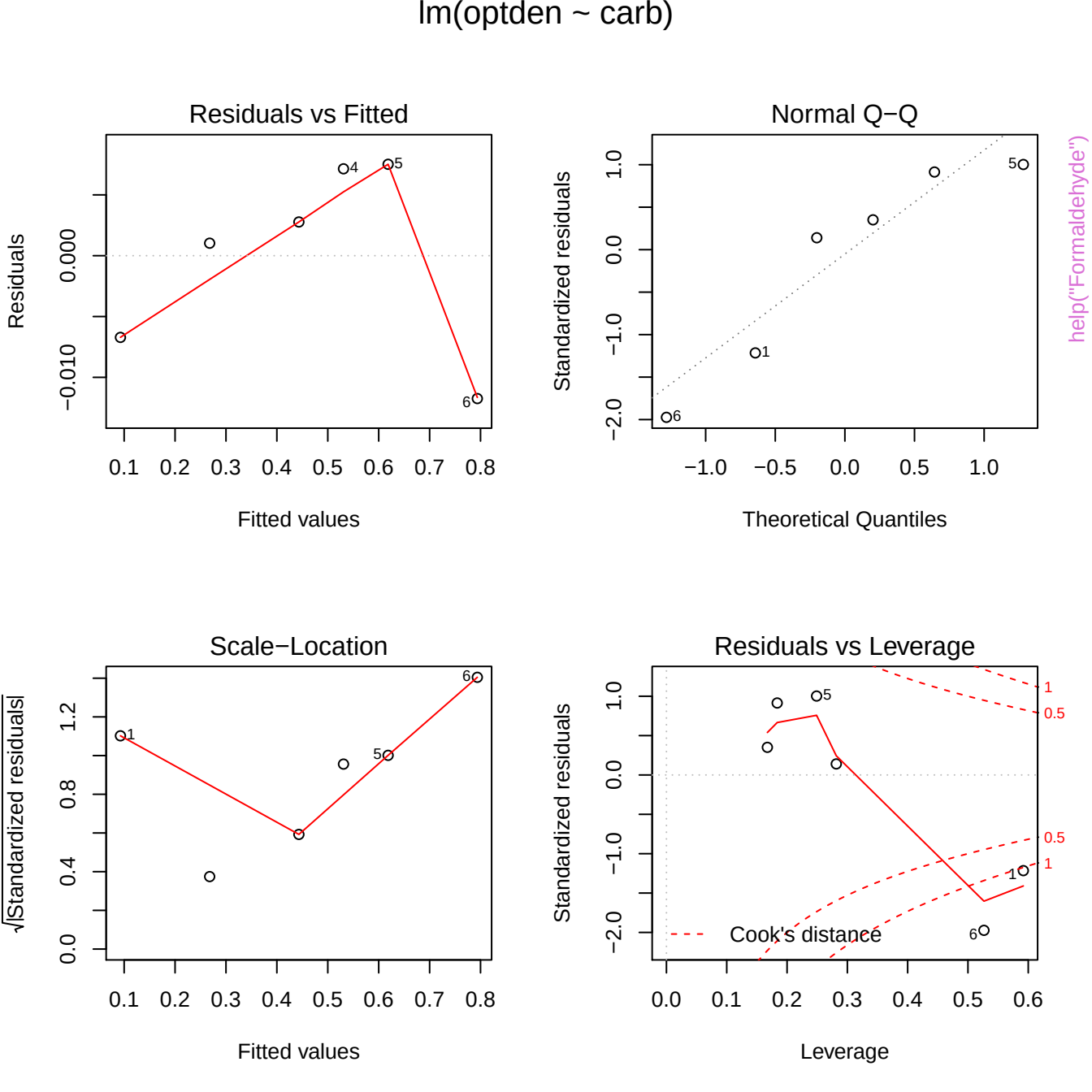
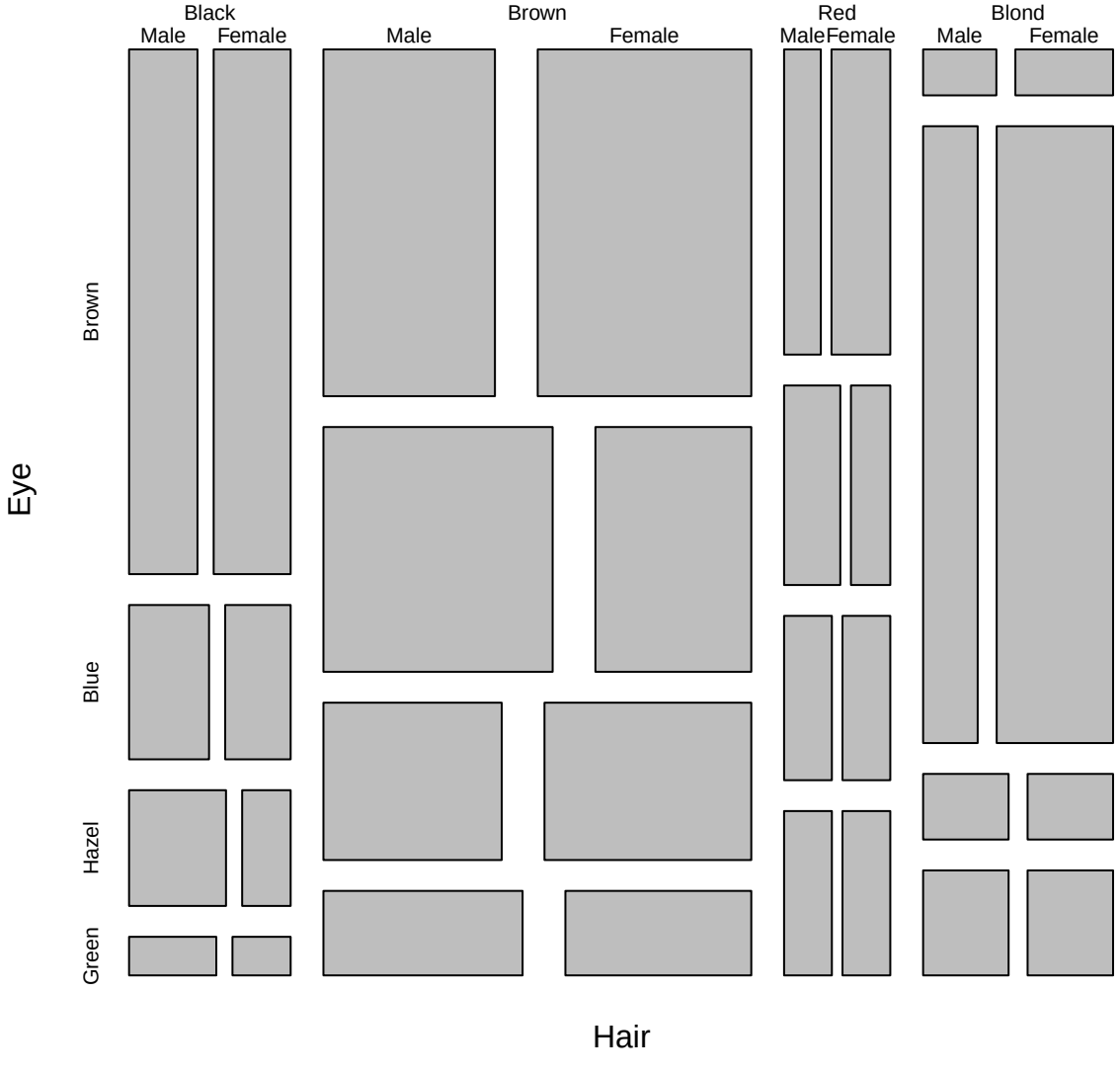

Given : Run
density
conc
0.0
0.5
1.0
1.5
2.0
0
2
4
6
8
10


Given : Run
density
log(conc)
−3 −2 −1 0 1 2
0.0 0.5 1.0 1.5 2.0


Formaldehyde data
Optical Density
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.2
0.4
0.6
0.8
Carbohydrate (ml)
help("Formaldehyde")

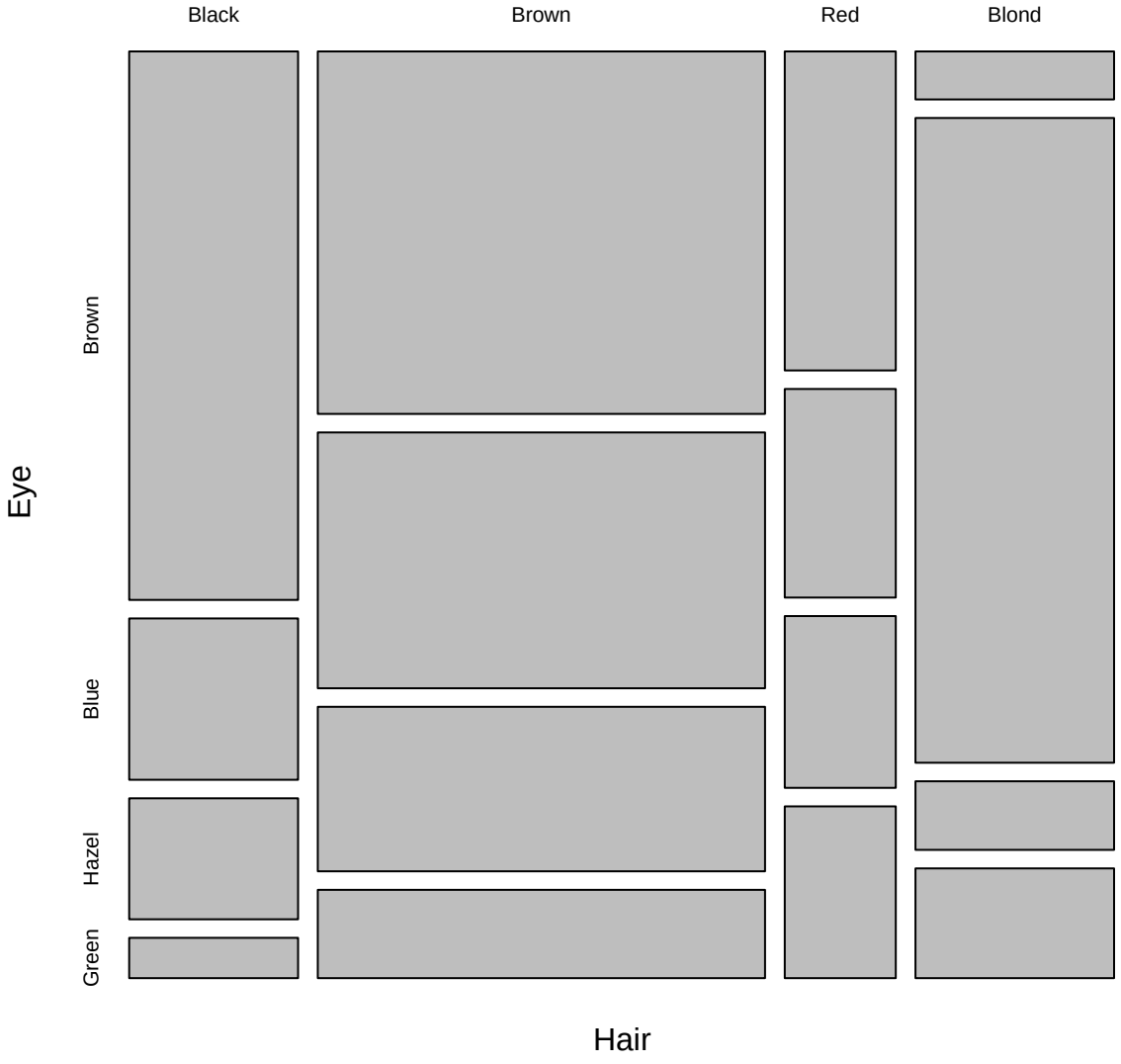

lm(optden ~ carb)
Residuals vs Fitted
Residuals
Fitted values
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("Formaldehyde")
Scale−Location
√|Standardized residuals|
Fitted values
Residuals vs Leverage
Standardized residuals
Leverage
Cook's distance

HairEyeColor

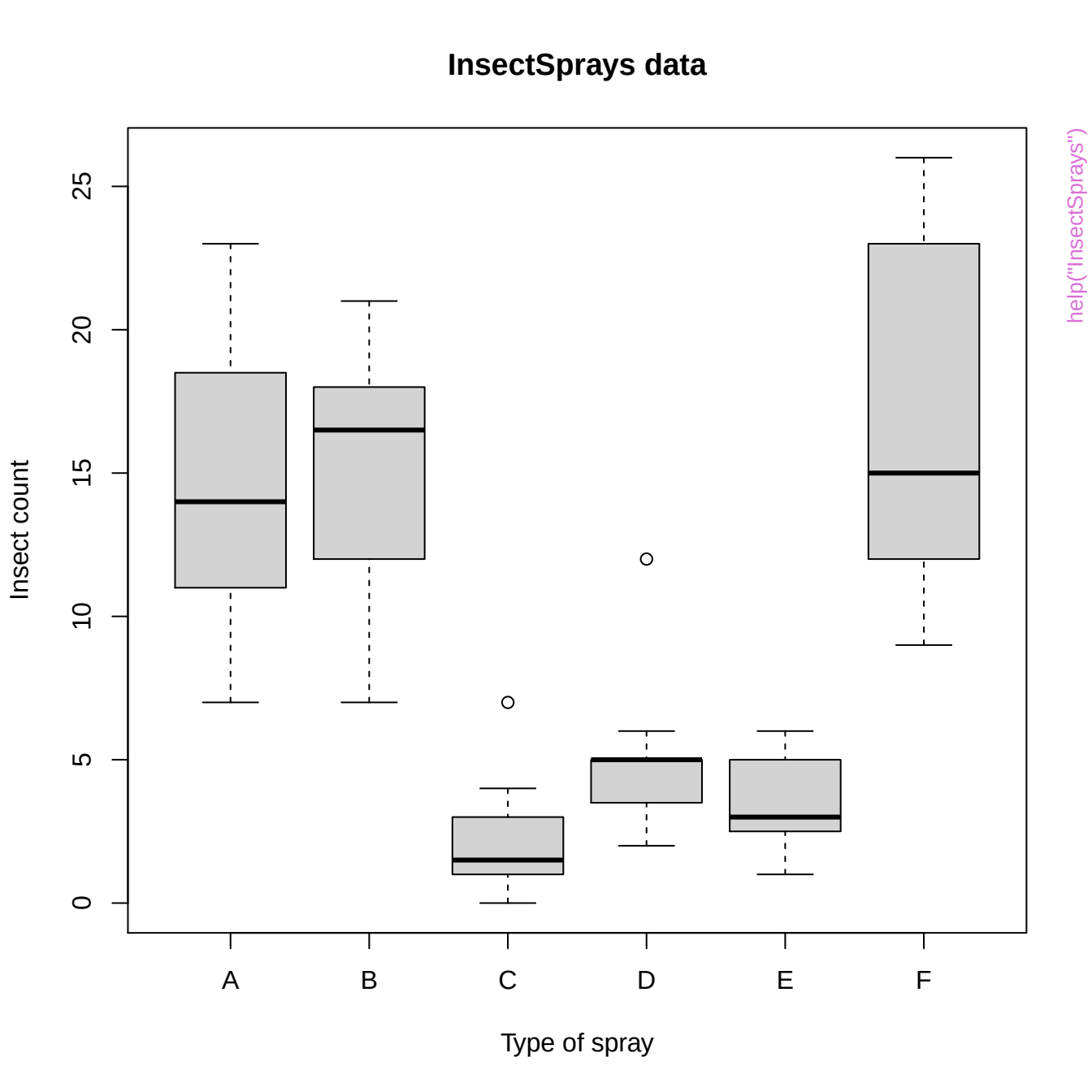


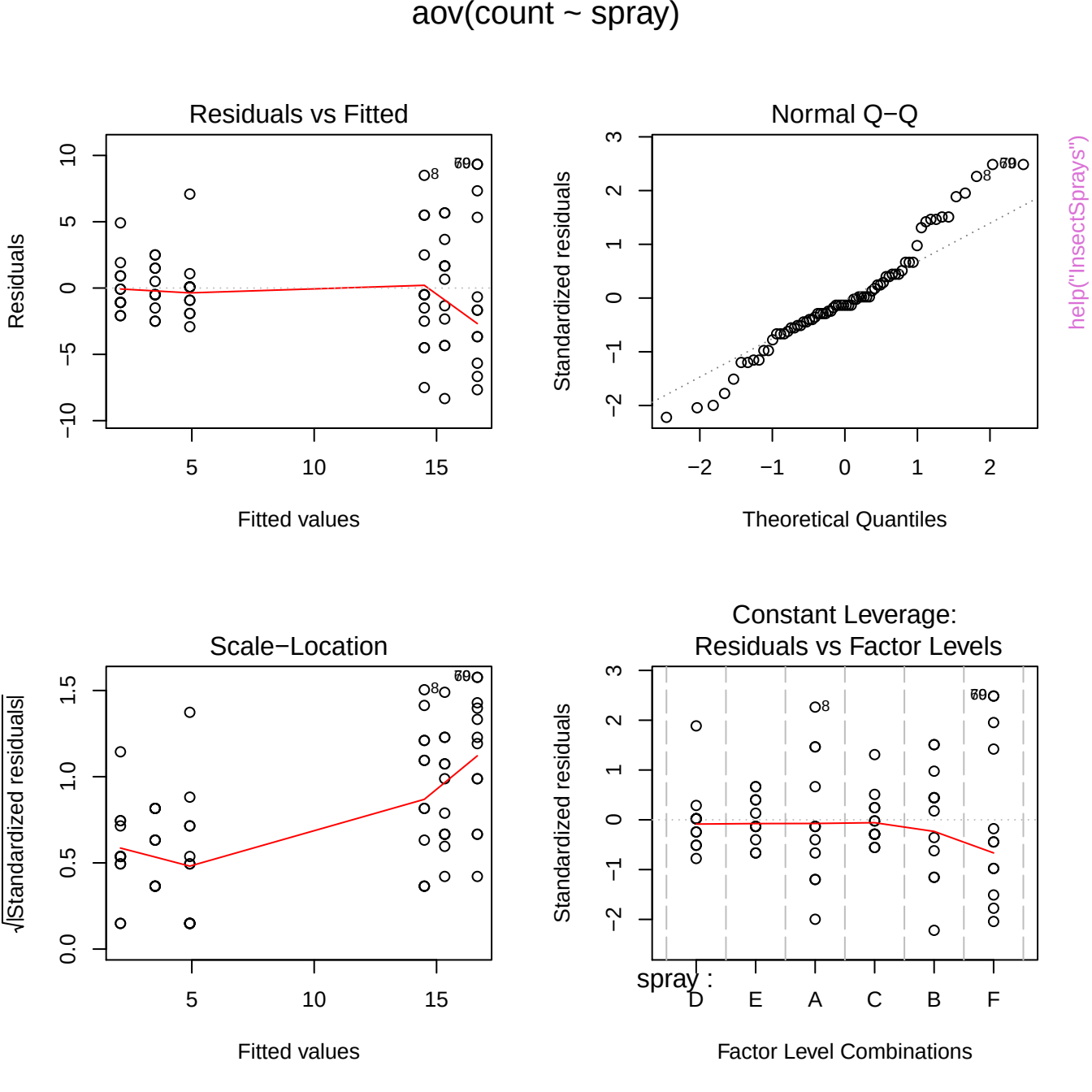
help("HairEyeColor")

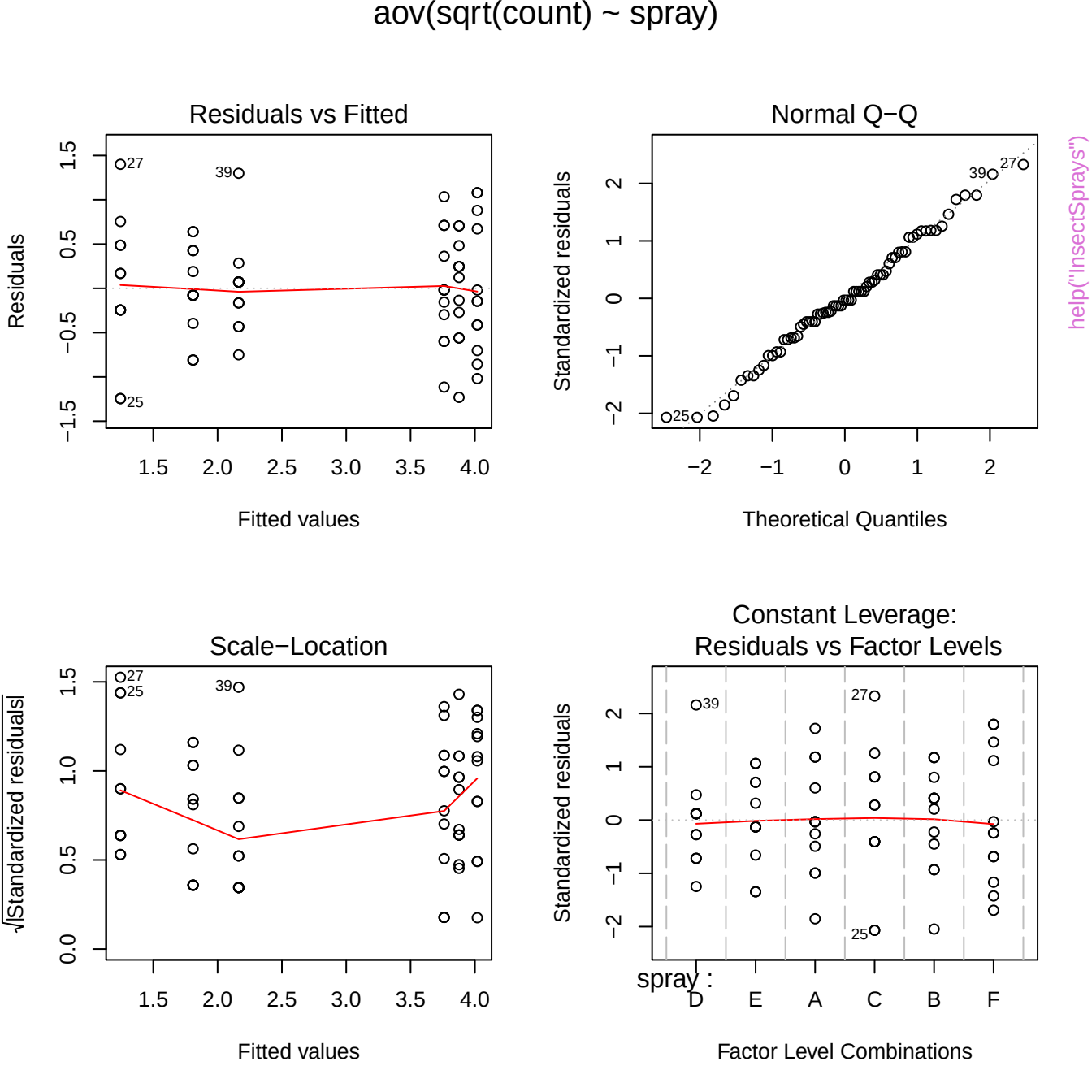
Relation between hair and eye color

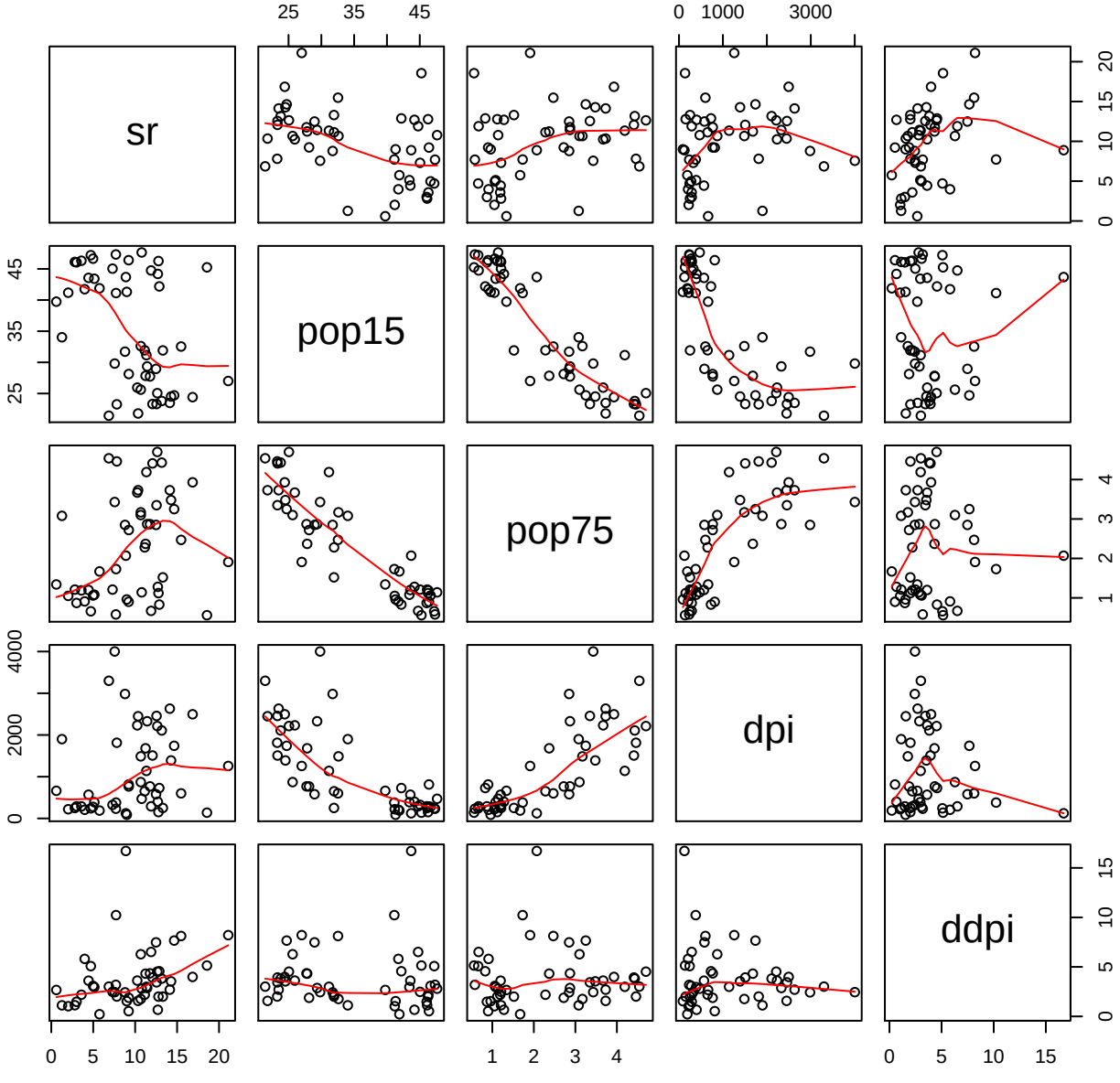


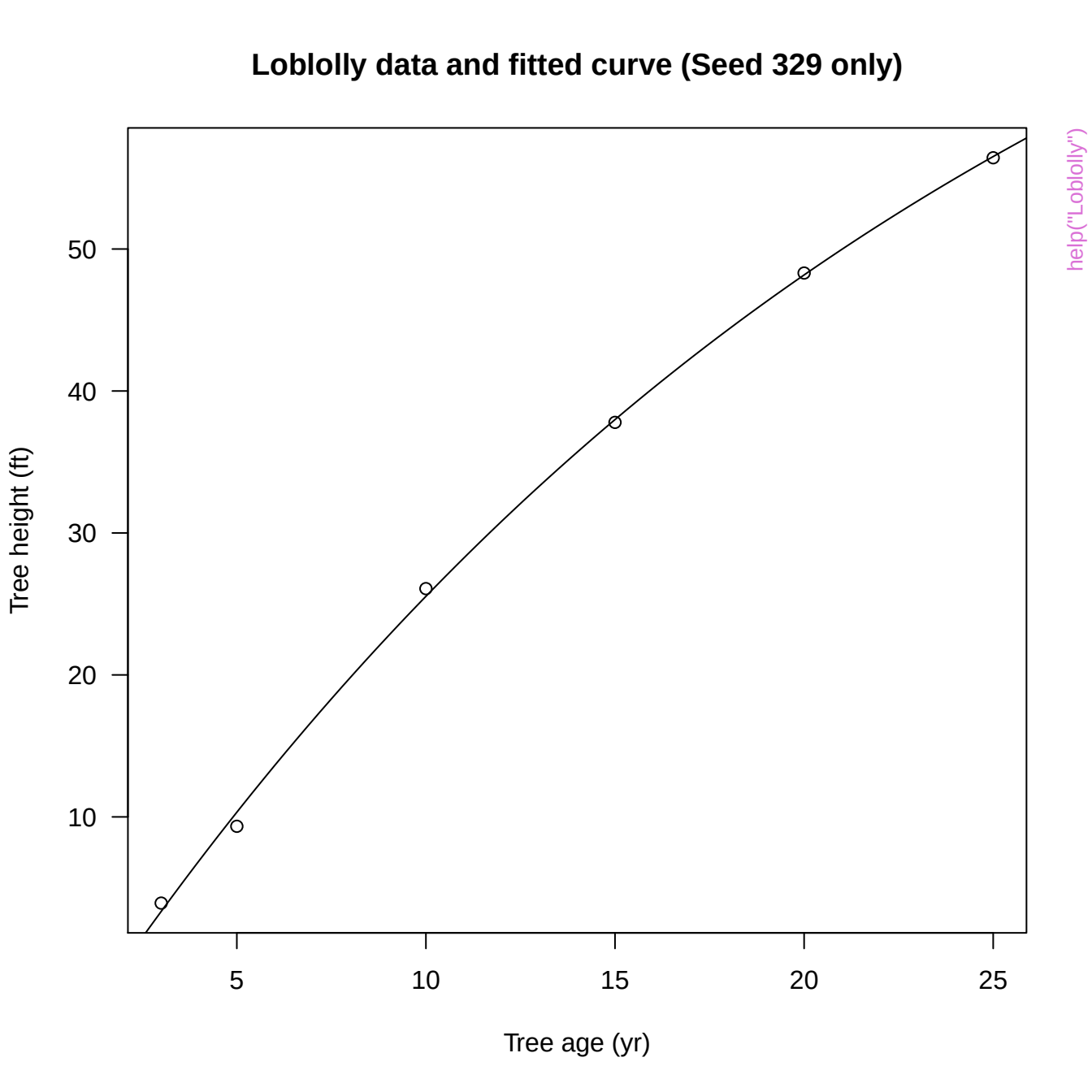
help("HairEyeColor")

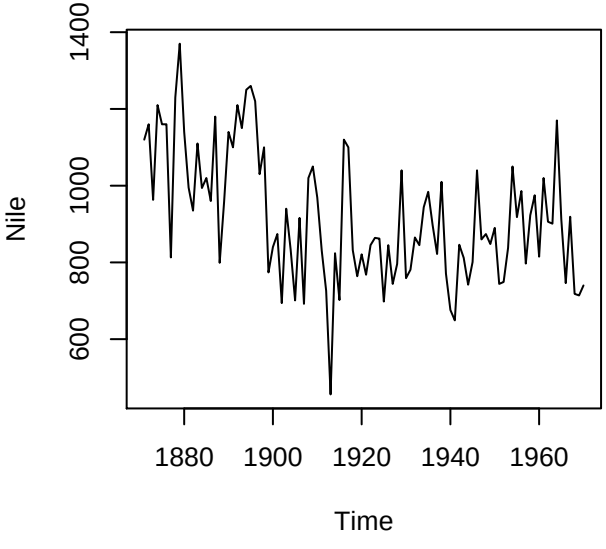

InsectSprays data
Insect count
0
5
10
15
20
25
A
B
C
D
E
F
Type of spray
help("InsectSprays")

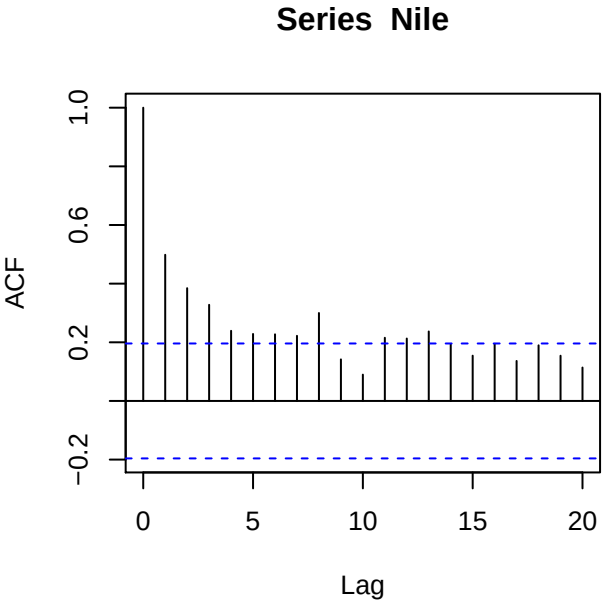

aov(count ~ spray)
Residuals vs Fitted
Residuals
Fitted values
Normal Q−Q
Standardized residuals
Theoretical Quantiles
Scale−Location
√|Standardized residuals|
Fitted values
Constant Leverage:
Residuals vs Factor Levels
Standardized residuals
spray :
D
E
A
C
B
F
Factor Level Combinations
help("InsectSprays")


aov(sqrt(count) ~ spray)
Residuals vs Fitted
Residuals
Fitted values
27
39
25
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("InsectSprays")
Scale−Location
√|Standardized residuals|
Constant Leverage:
Residuals vs Factor Levels
spray :
D
E
A
C
B
F
Factor Level Combinations

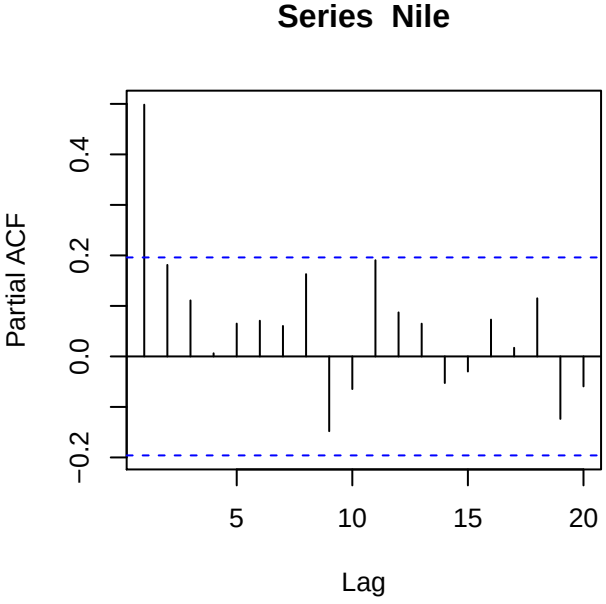

LifeCycleSavings data
sr
pop15
pop75
dpi
ddpi
help("LifeCycleSavings")

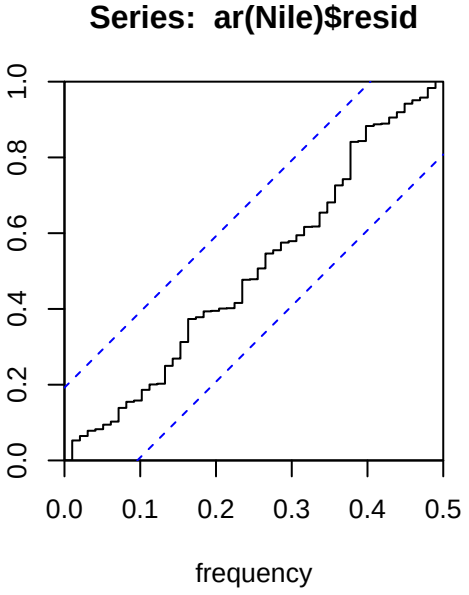

Loblolly data and fitted curve (Seed 329 only)
help("Loblolly")
Tree height (ft)
10
20
30
40
50
5
10
15
20
25
Tree age (yr)

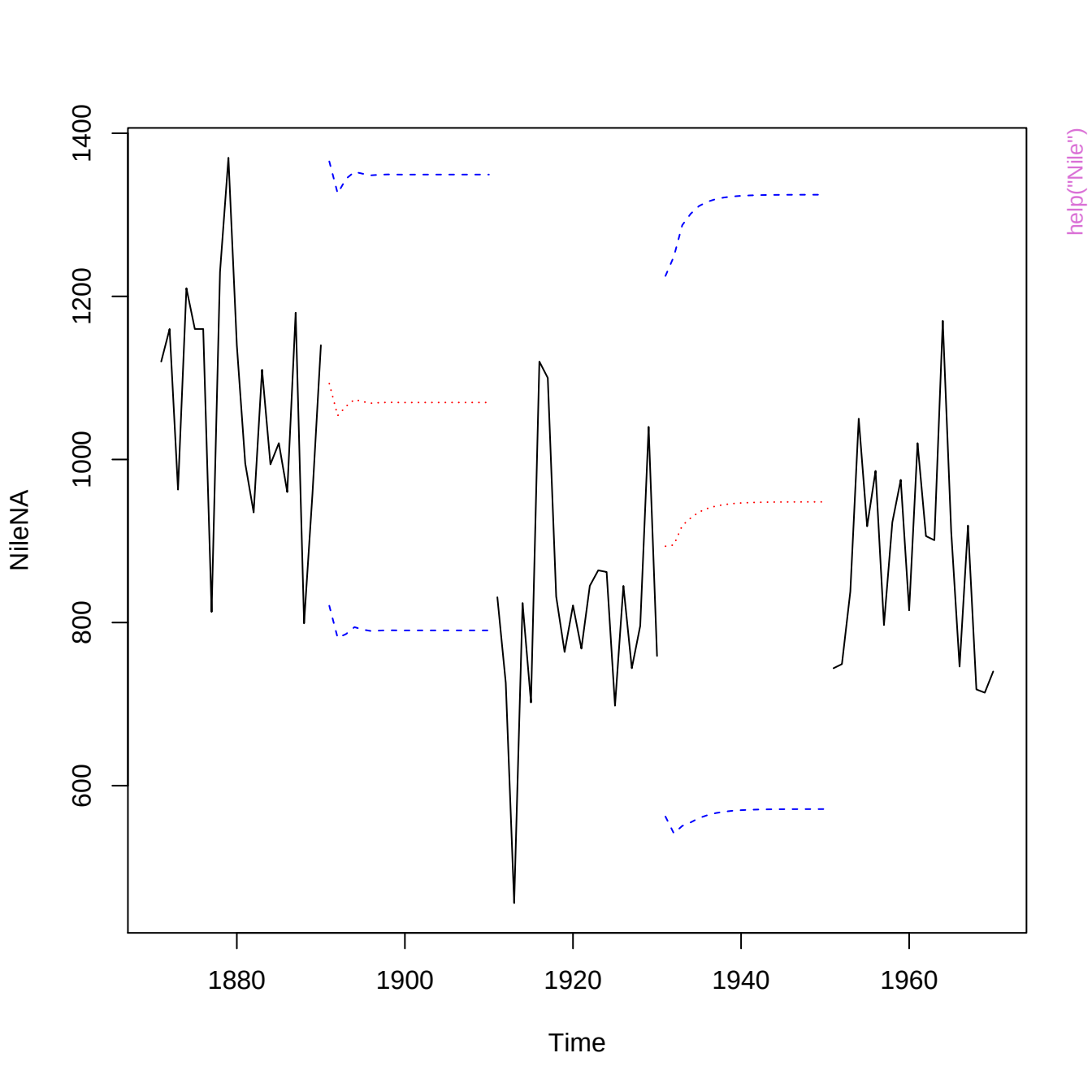

Nile
1400
1000
800
600
1880
1900
1920
1940
1960
Time

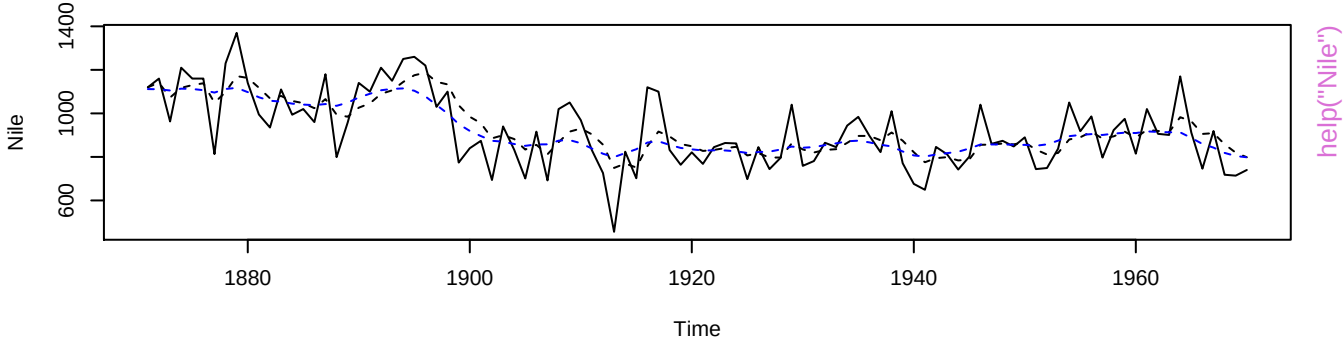

Series Nile
ACF
1.0
0.6
0.2
−0.2
0
5
10
15
20
Lag

help("Nile")

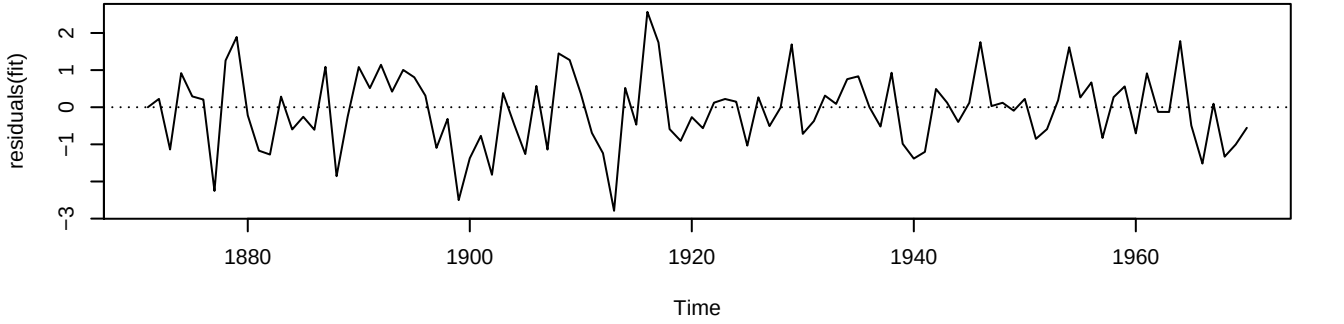

Series Nile
Partial ACF
0.4
0.2
0.0
−0.2
5
10
15
20
Lag

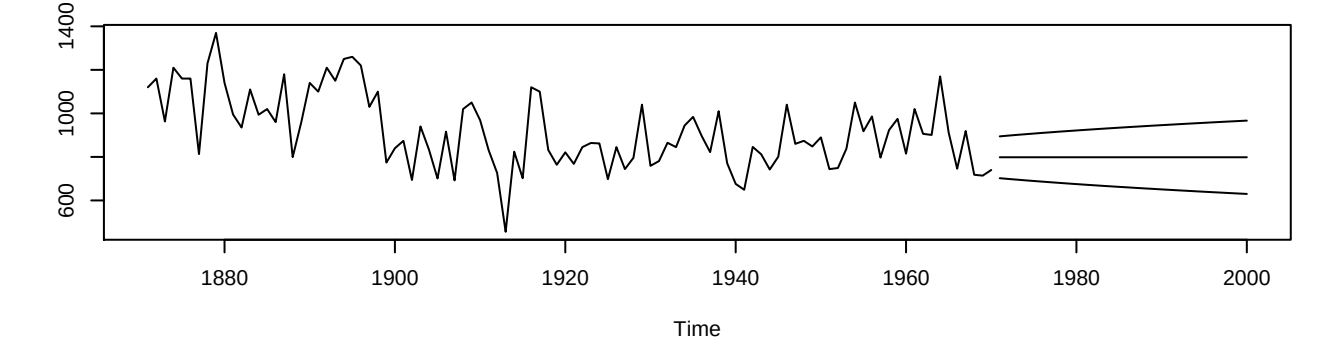

Series: ar(Nile)$resid
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.1
0.2
0.3
0.4
0.5
frequency

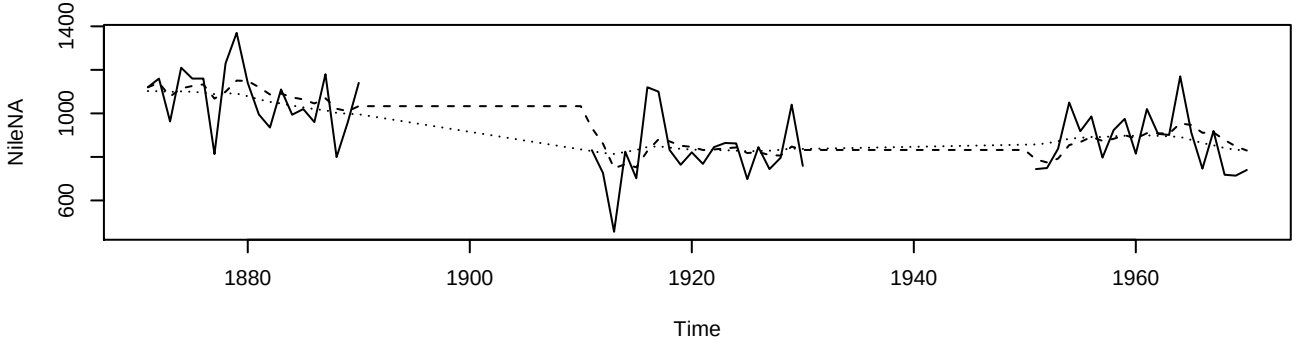

NileNA
1400
1200
1000
800
600
1880
1900
1920
1940
1960
Time
help("Nile")


Nile
1400
1000
600
1880
1900
1920
1940
1960
Time

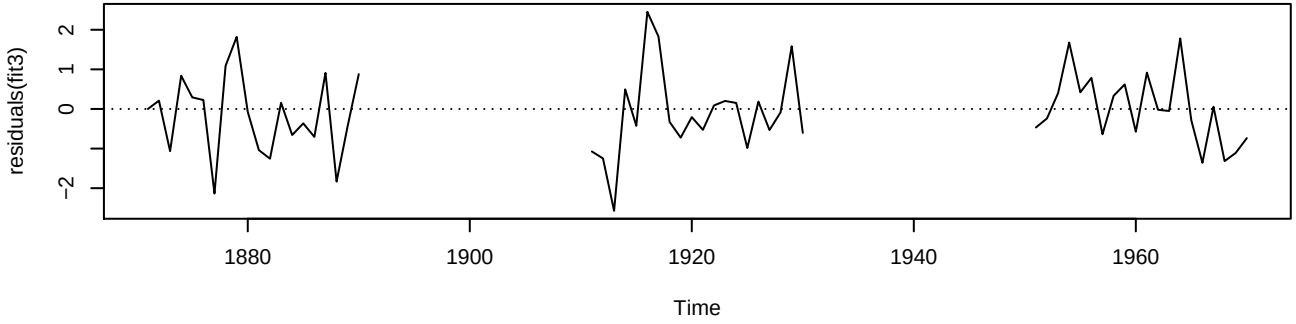
help("Nile")


residuals(fit)
2
1
0
−1
−3
1880
1900
1920
1940
1960
Time

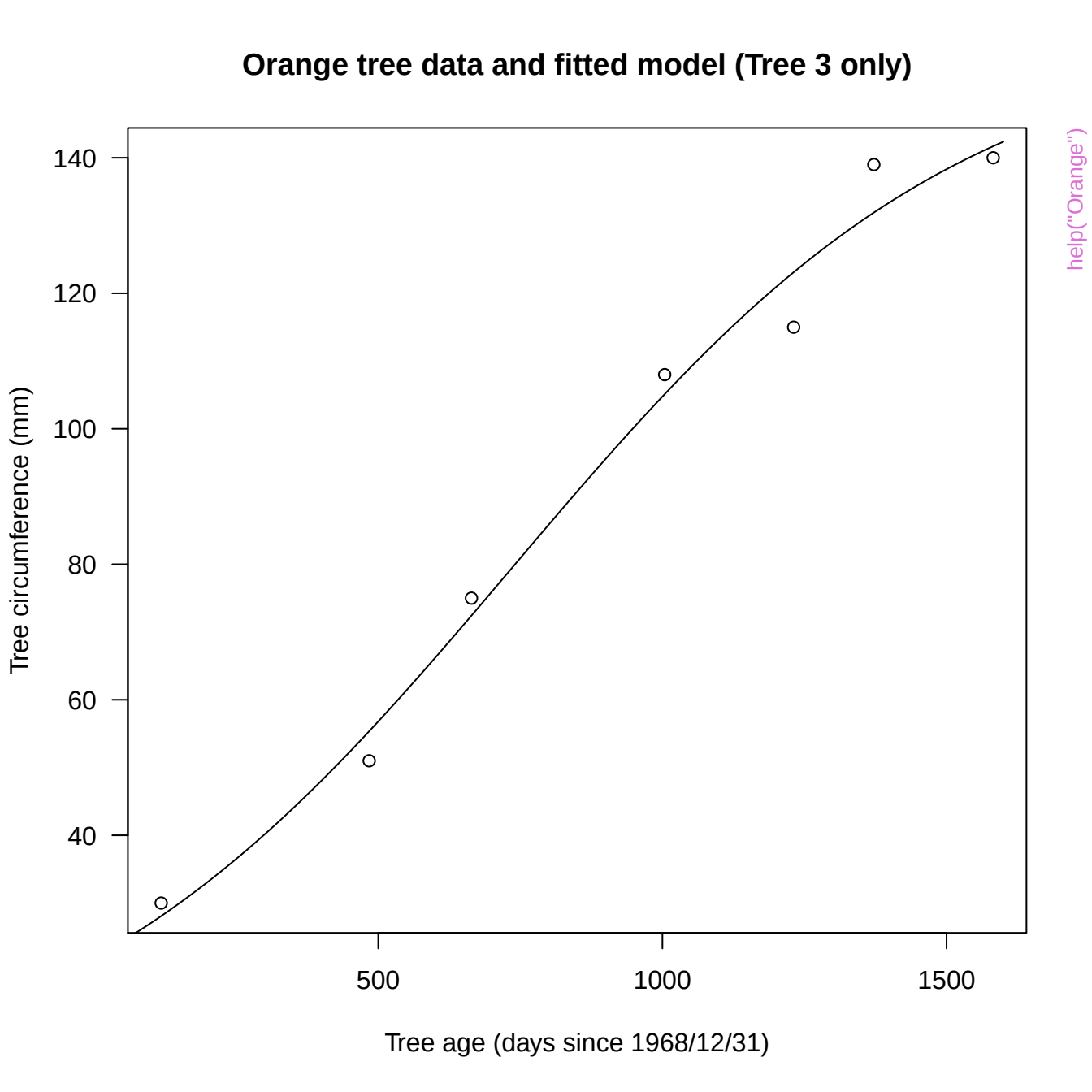

1400
1000
600
1880
1900
1920
1940
1960
1980
2000
Time


NileNA
1400
1000
600
1880
1900
1920
1940
1960
Time

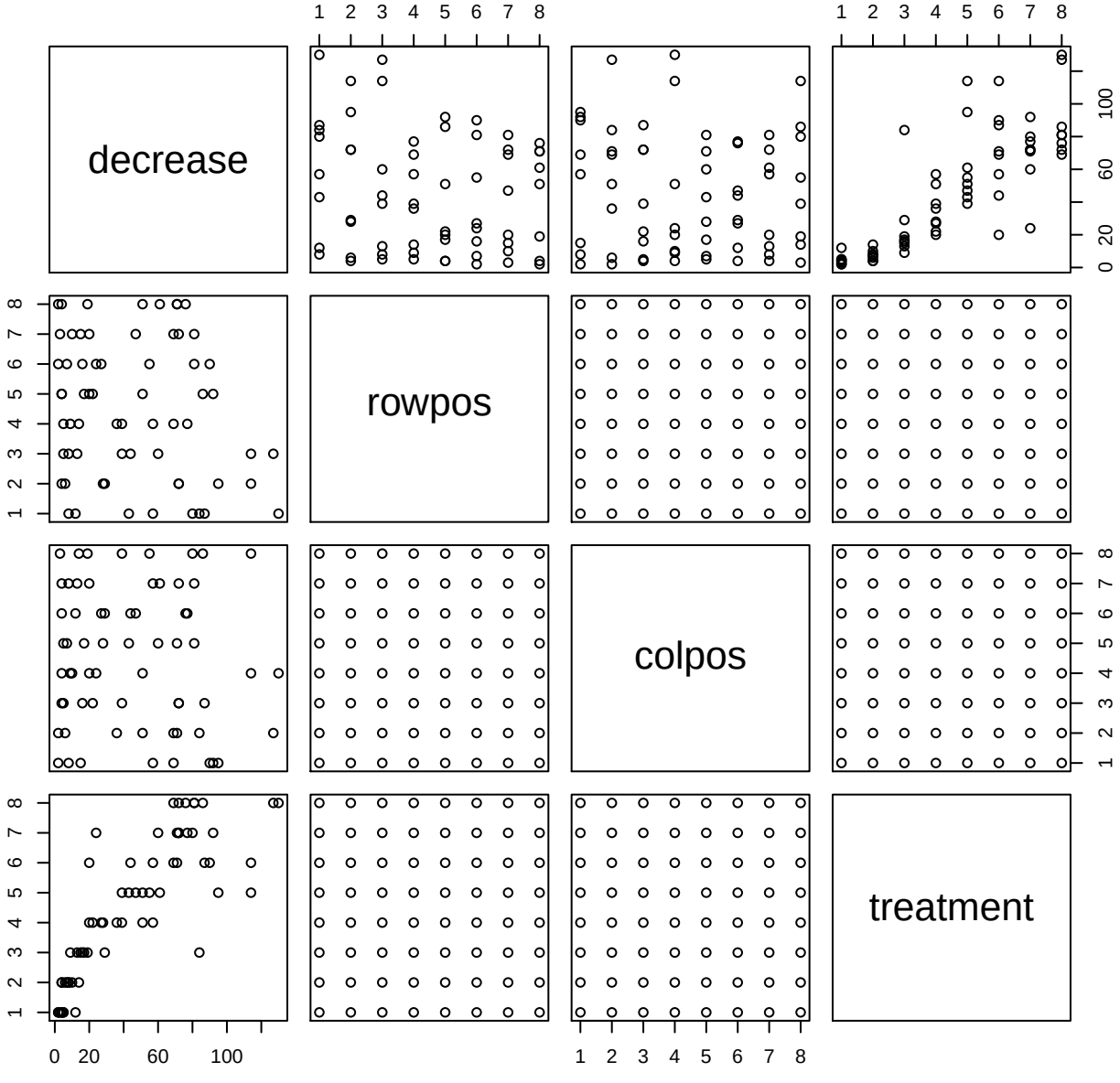
help("Nile")


residuals(fit3)
2
1
0
−2
1880
1900
1920
1940
1960
Time

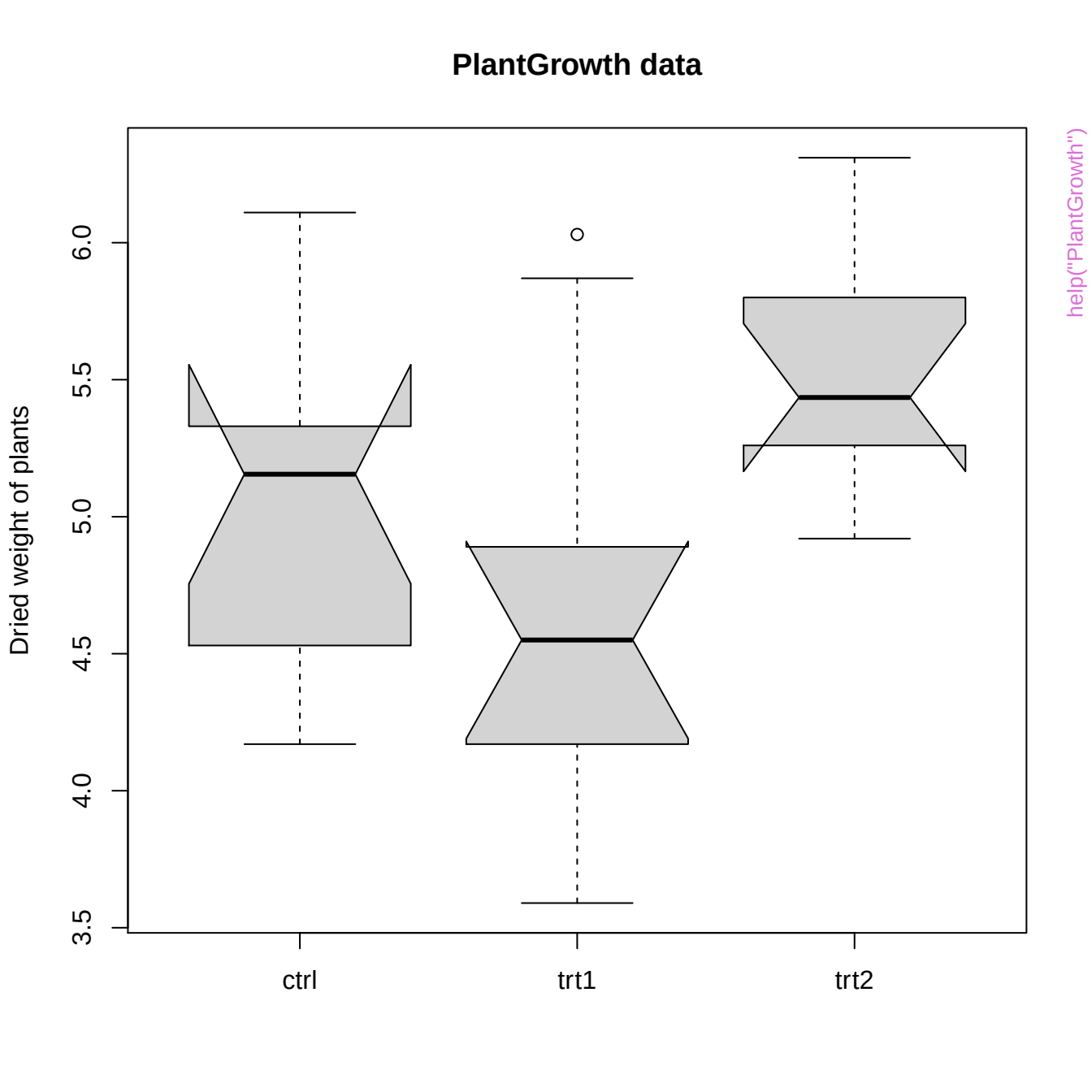
Given : Tree
500
1000
1500
50
100
150
200
circumference
age

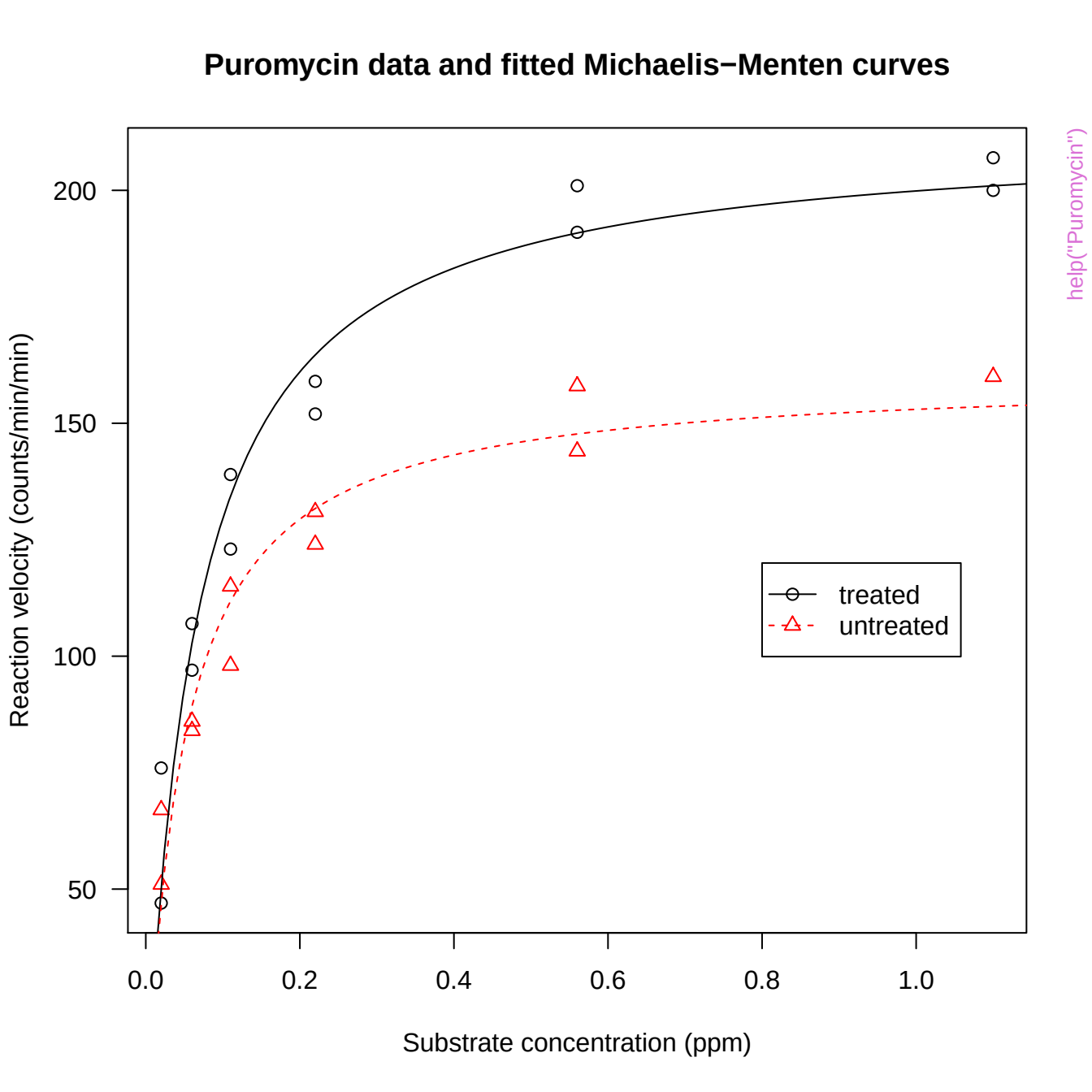

Orange tree data and fitted model (Tree 3 only)
Tree circumference (mm)
140
120
100
80
60
40
500
1000
1500
Tree age (days since 1968/12/31)
help("Orange")

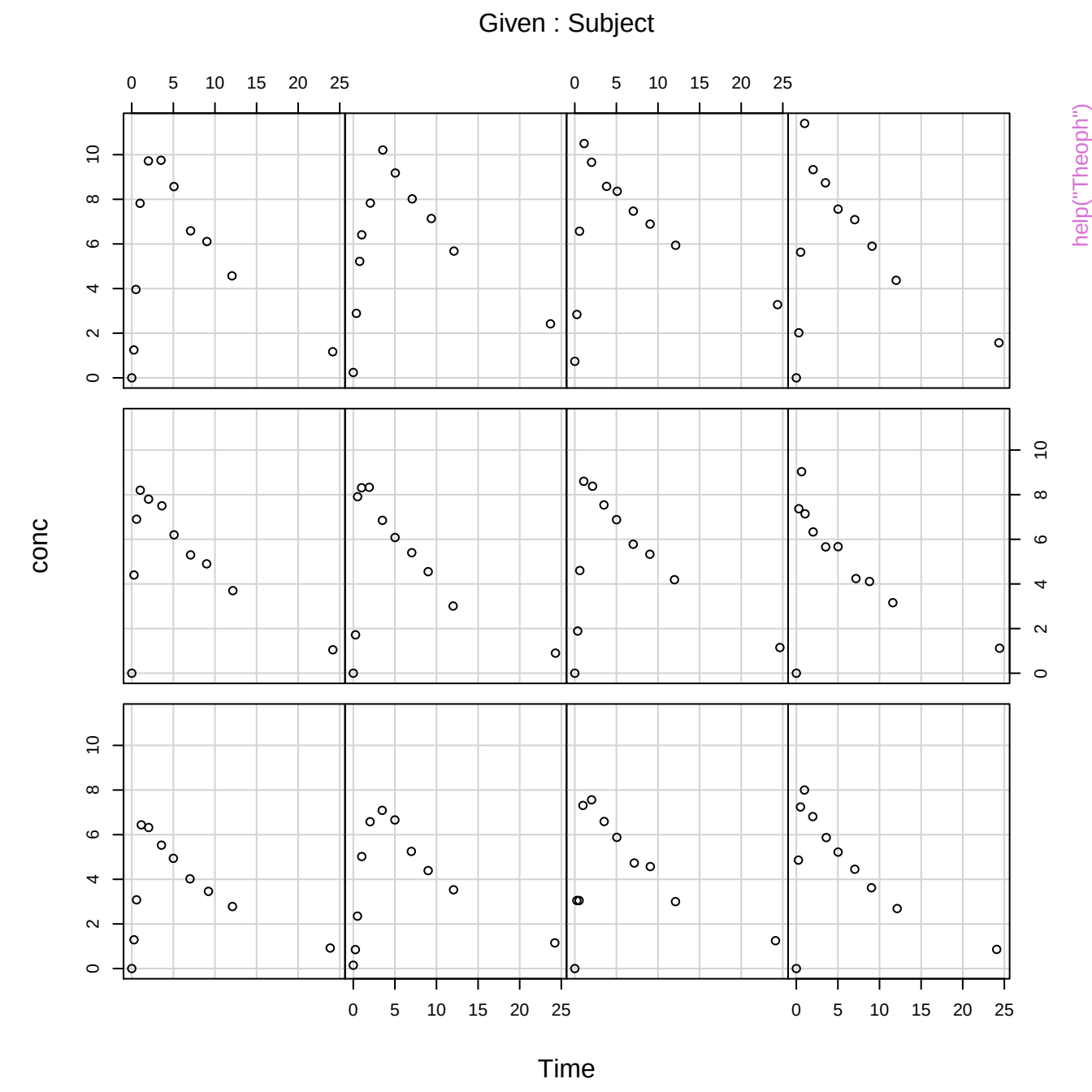
OrchardSprays data

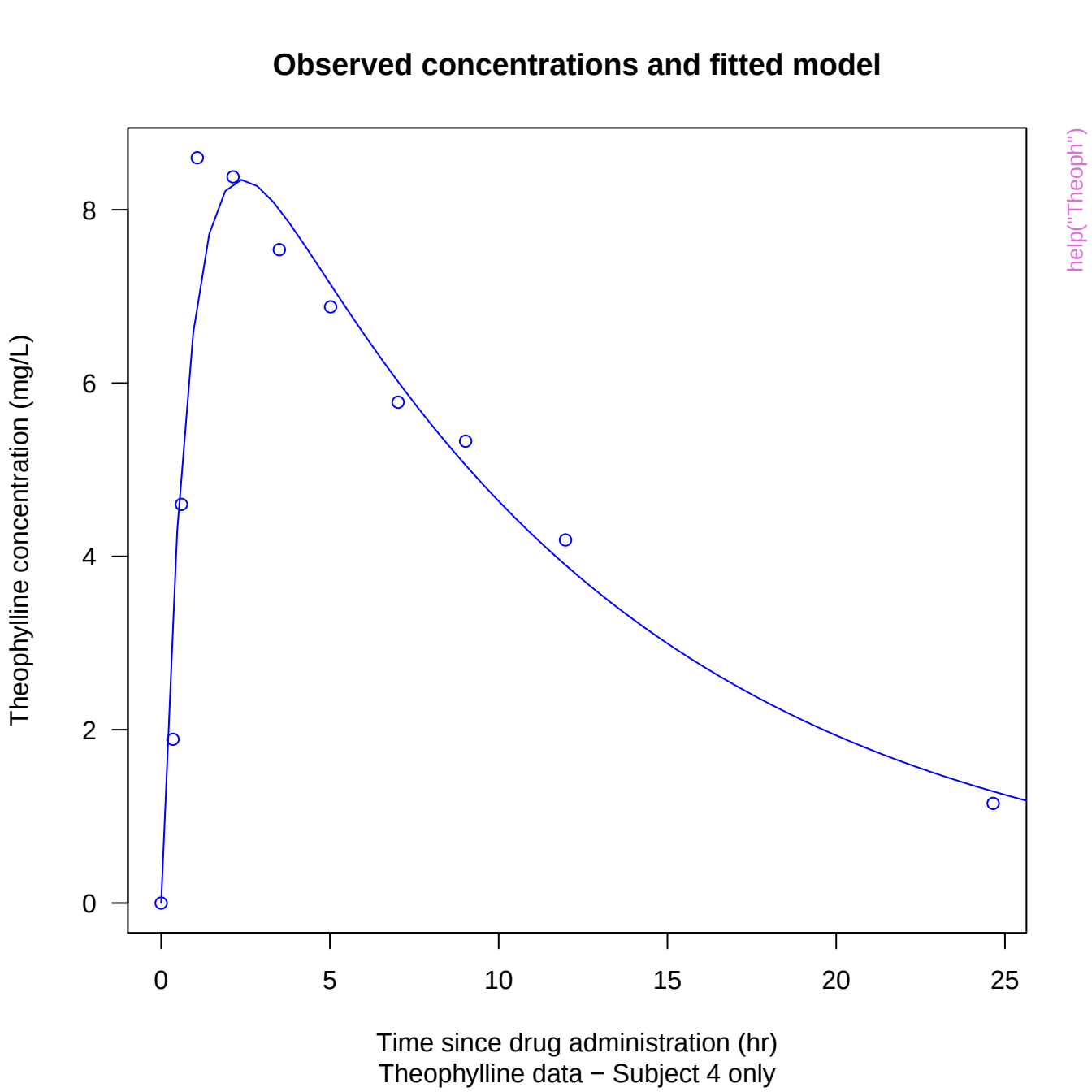


help("OrchardSprays")

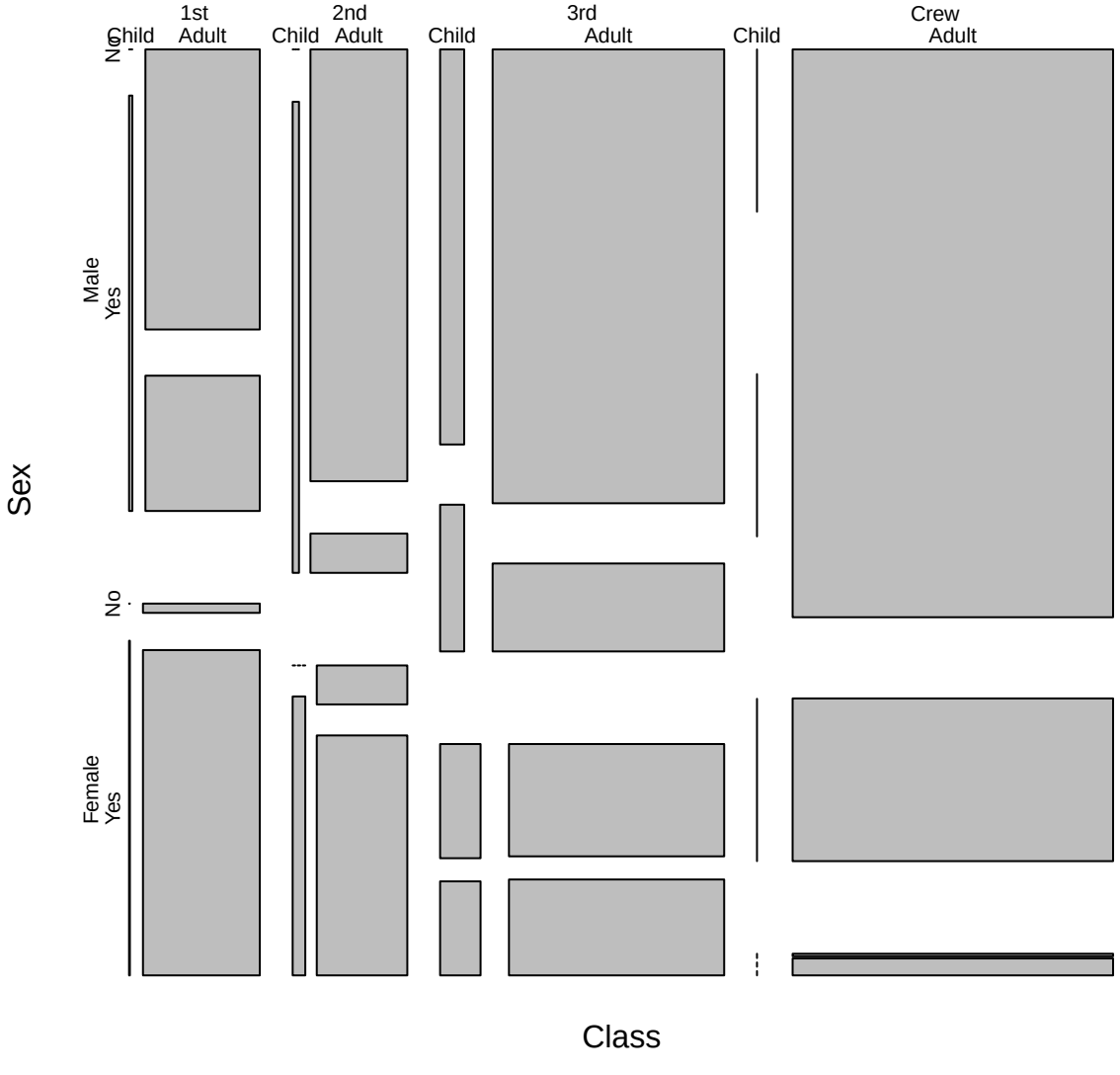

PlantGrowth data
Dried weight of plants
3.5
4.0
4.5
5.0
5.5
6.0
ctrl
trt1
trt2
help("PlantGrowth")


Puromycin data and fitted Michaelis−Menten curves
help("Puromycin")
Reaction velocity (counts/min/min)
Substrate concentration (ppm)
50
100
150
200
0.0
0.2
0.4
0.6
0.8
1.0
treated
untreated

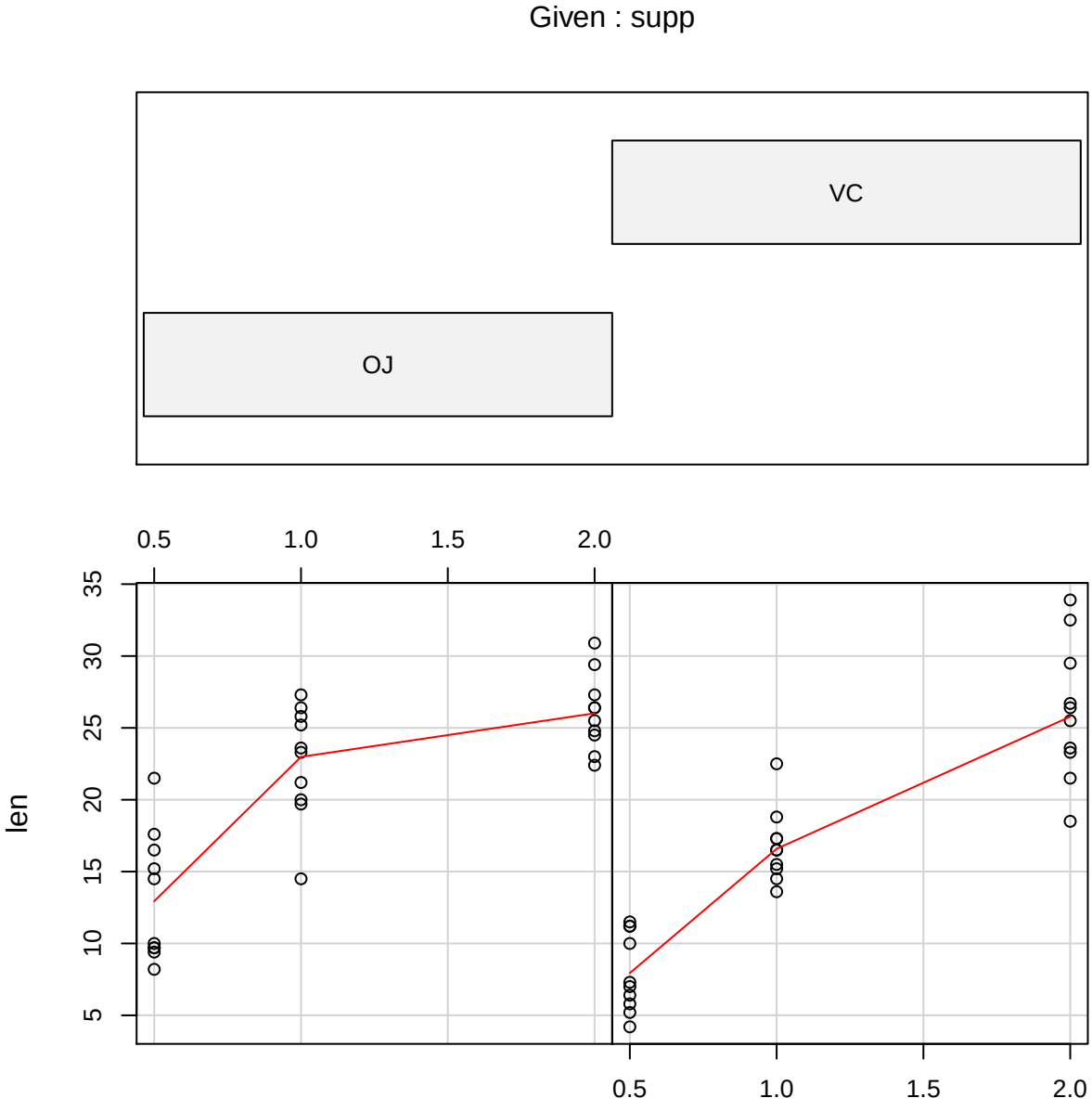

Given : Subject
conc
Time
help("Theoph")


Observed concentrations and fitted model
Theophylline concentration (mg/L)
0
2
4
6
8
0
5
10
15
20
25
Time since drug administration (hr)
Theophylline data − Subject 4 only
help("Theoph")

Survival on the Titanic



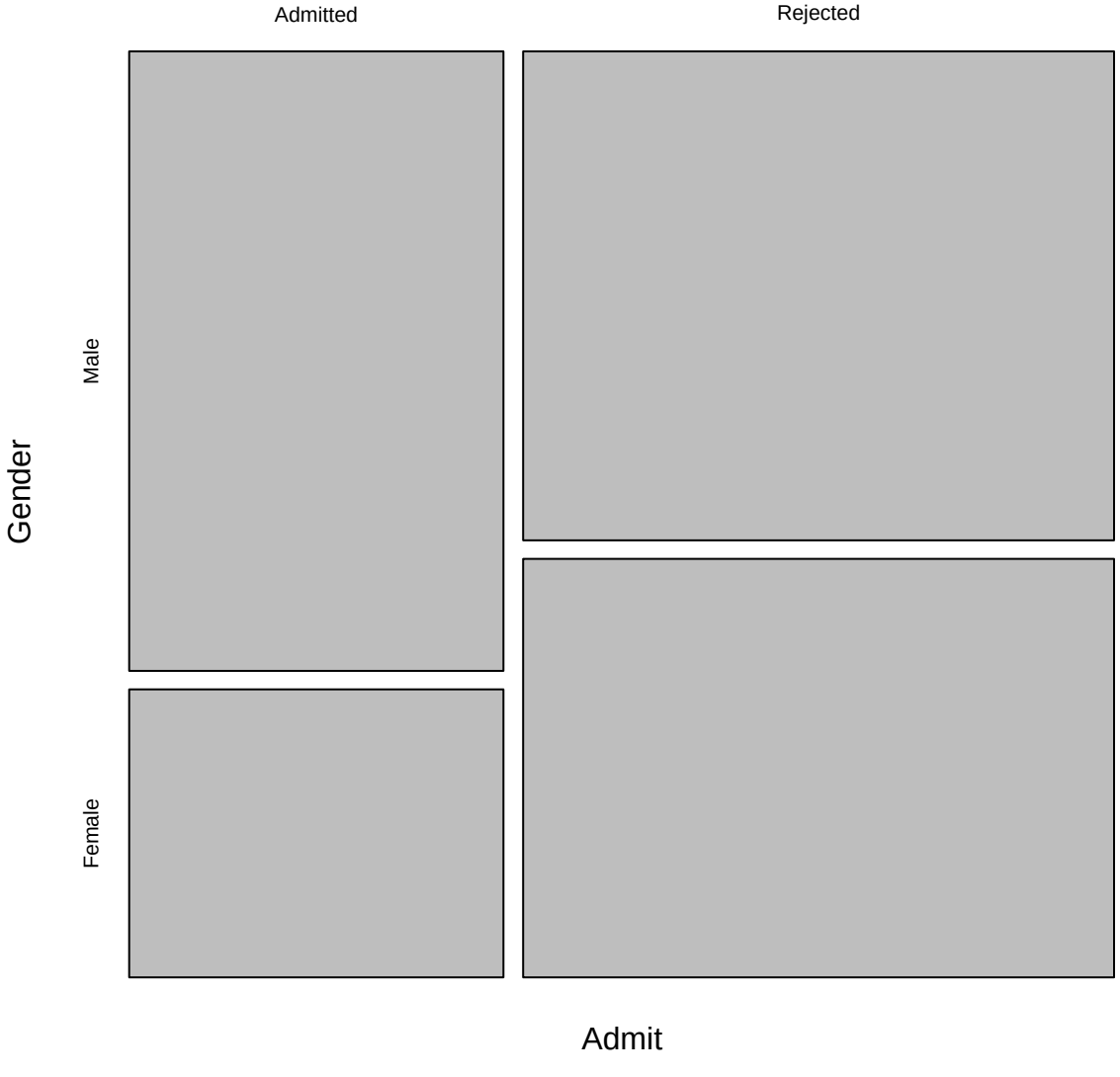
help("Titanic")



ToothGrowth data: length vs dose, given type of supplement

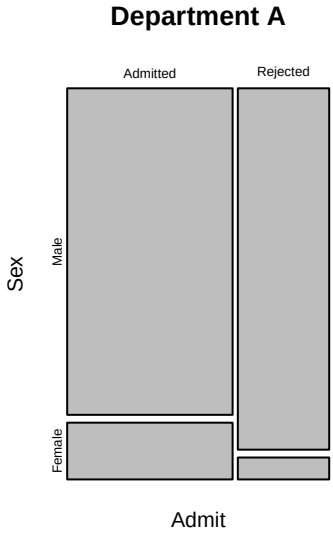
help("ToothGrowth")

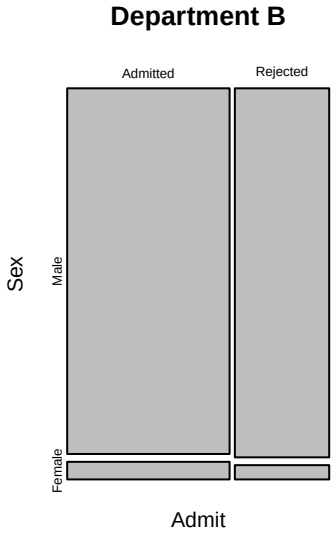
Student admissions at UC Berkeley

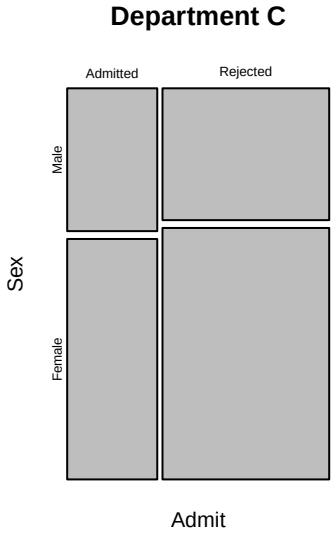


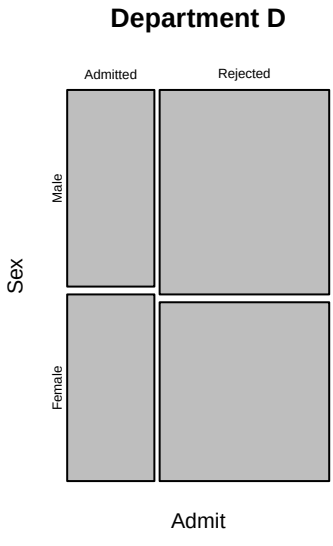
help("UCBAdmissions")

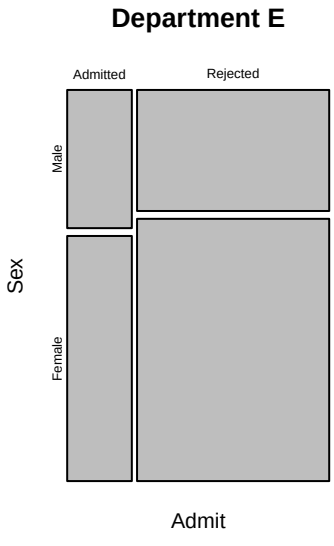
Student admissions at UC Berkeley

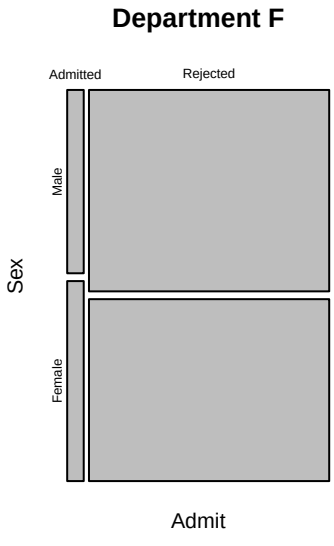




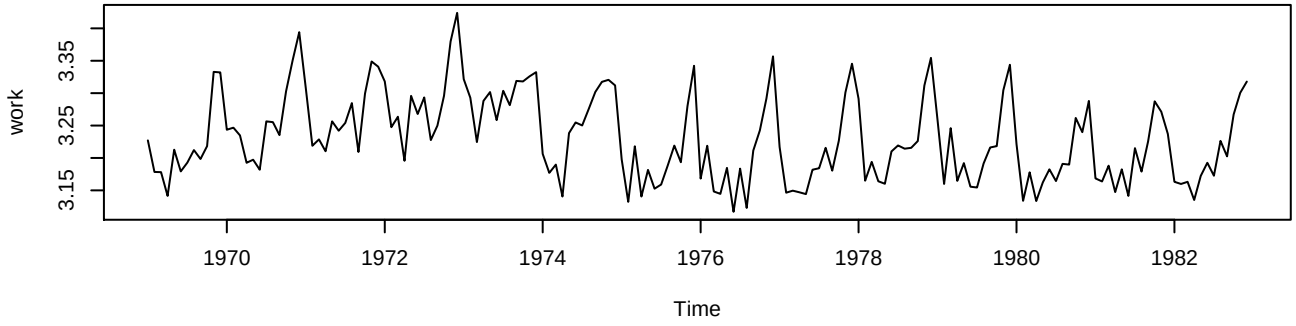




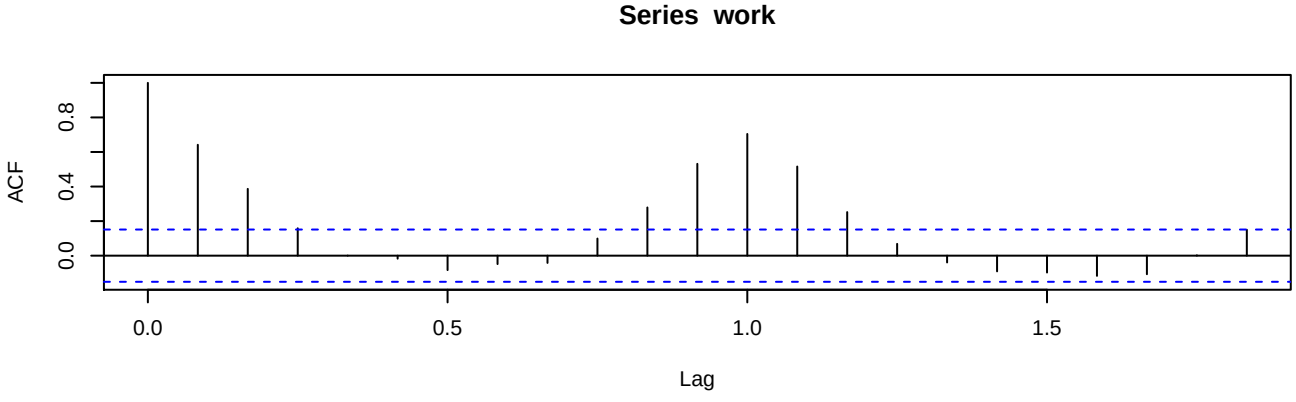


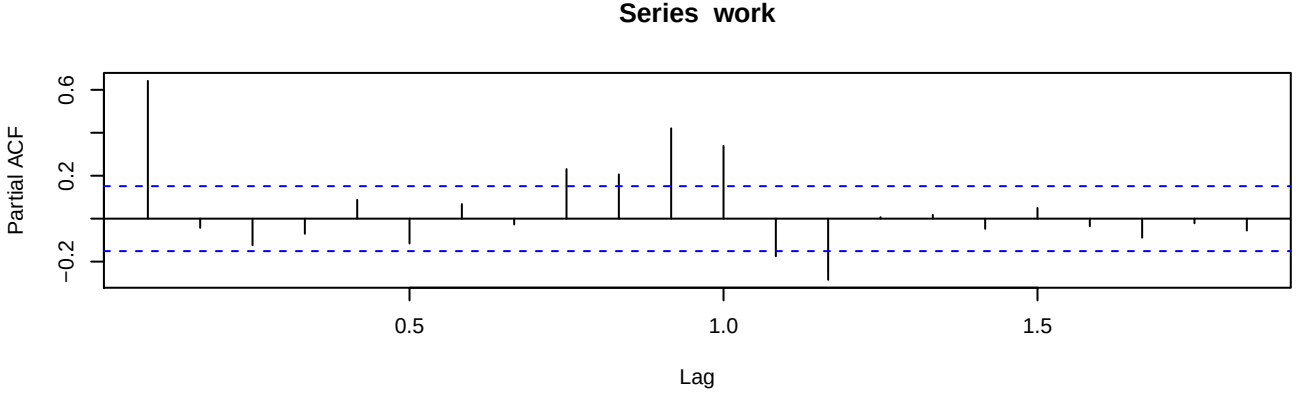


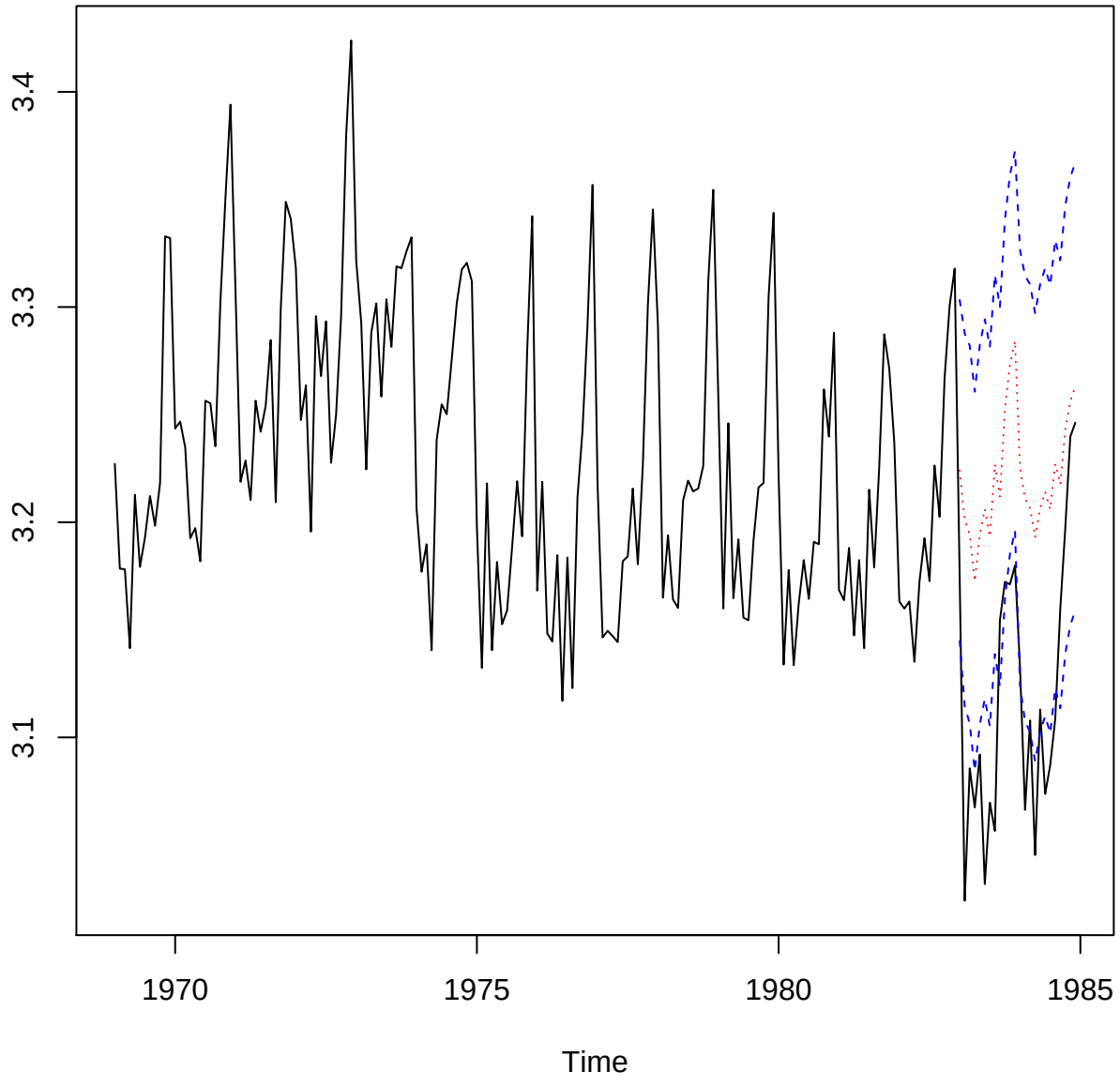
help("UCBAdmissions")

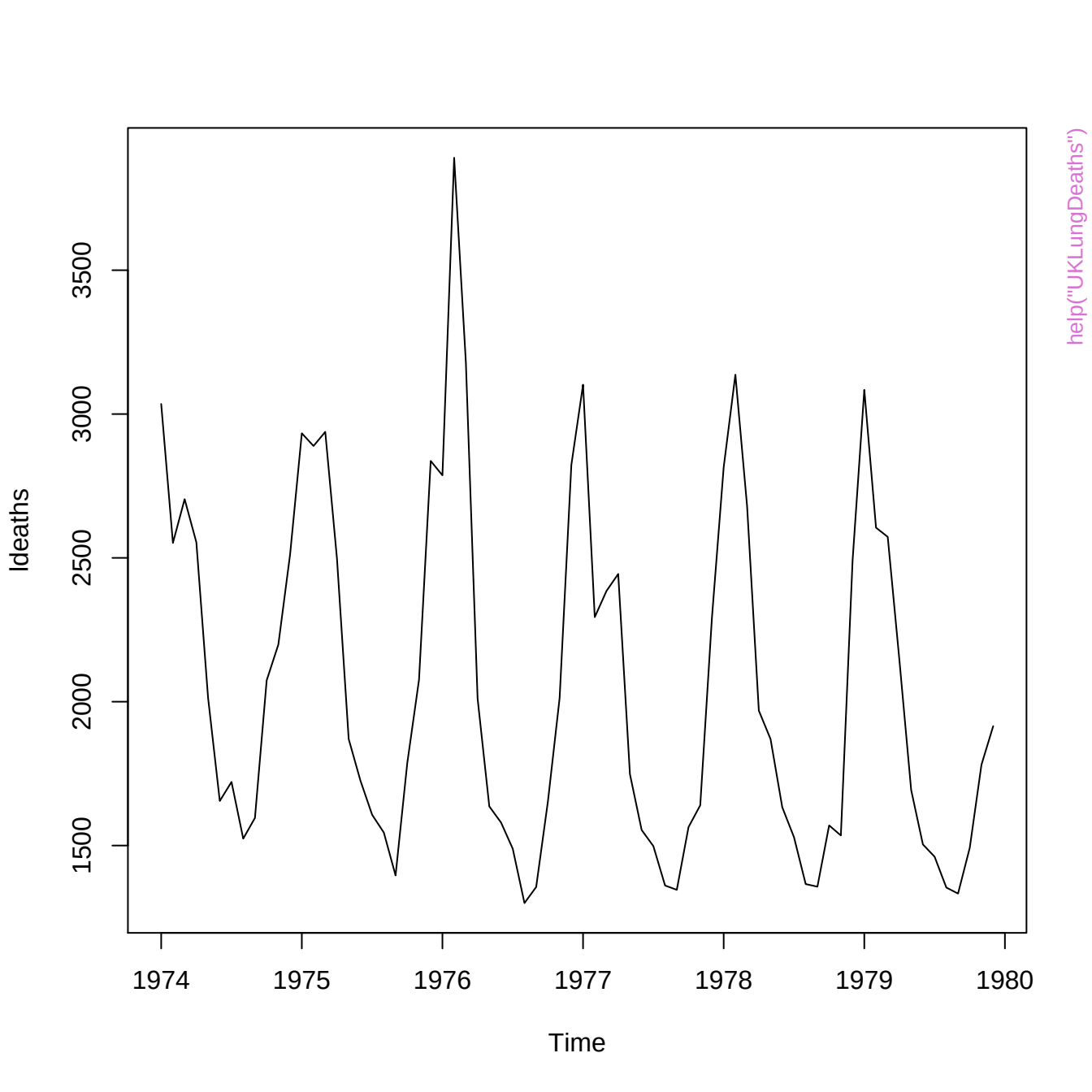


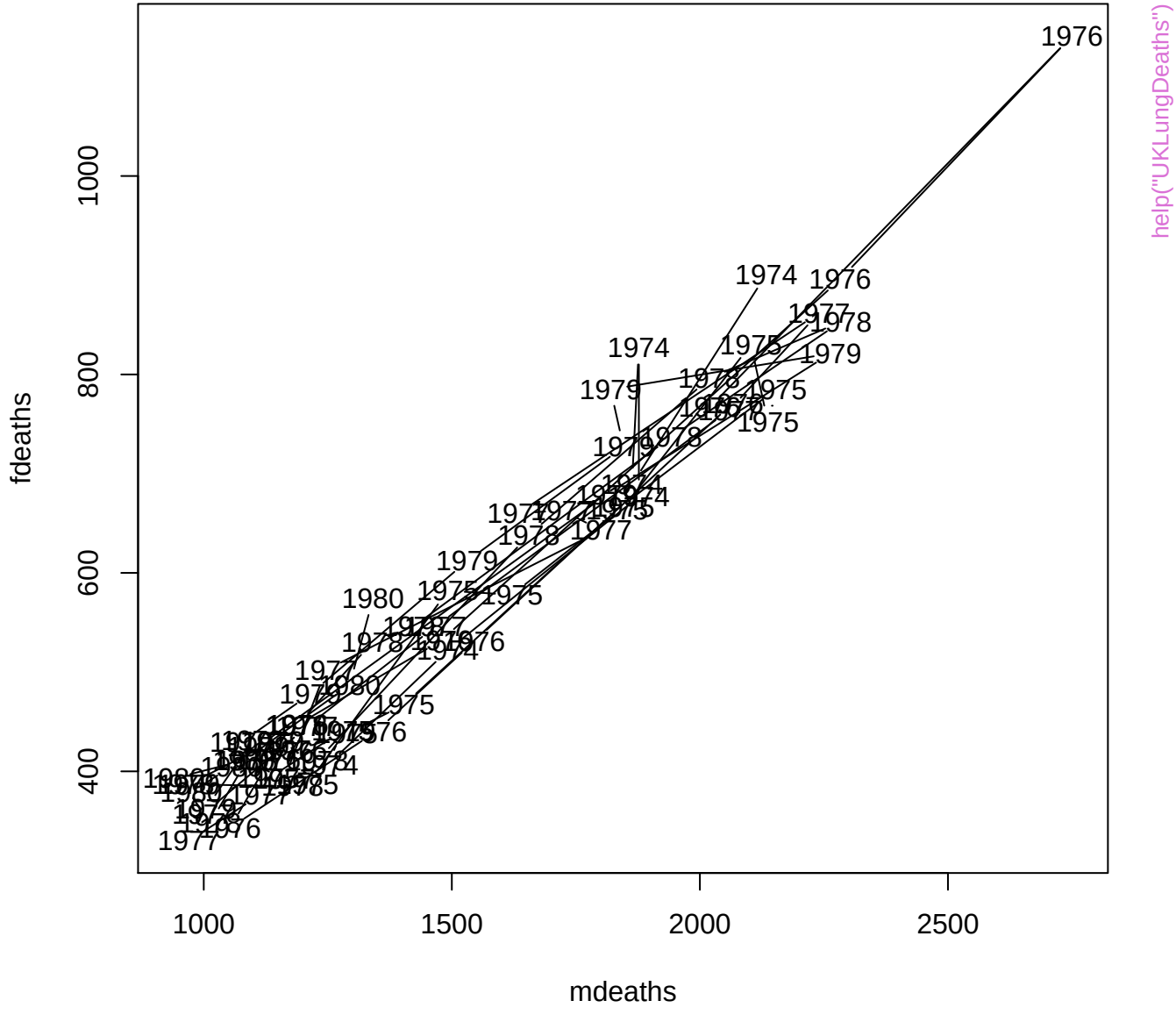
help("UKDriverDeaths")



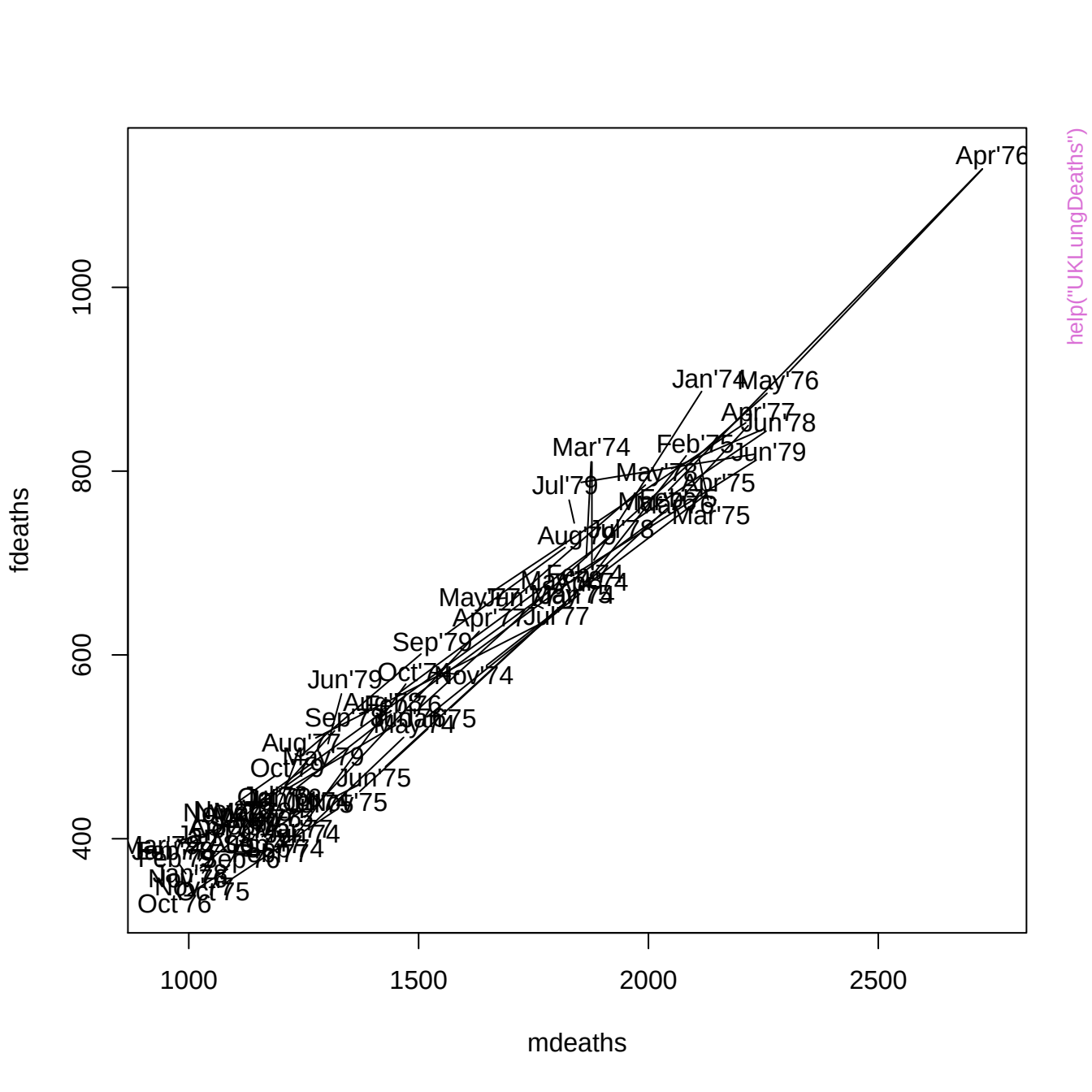


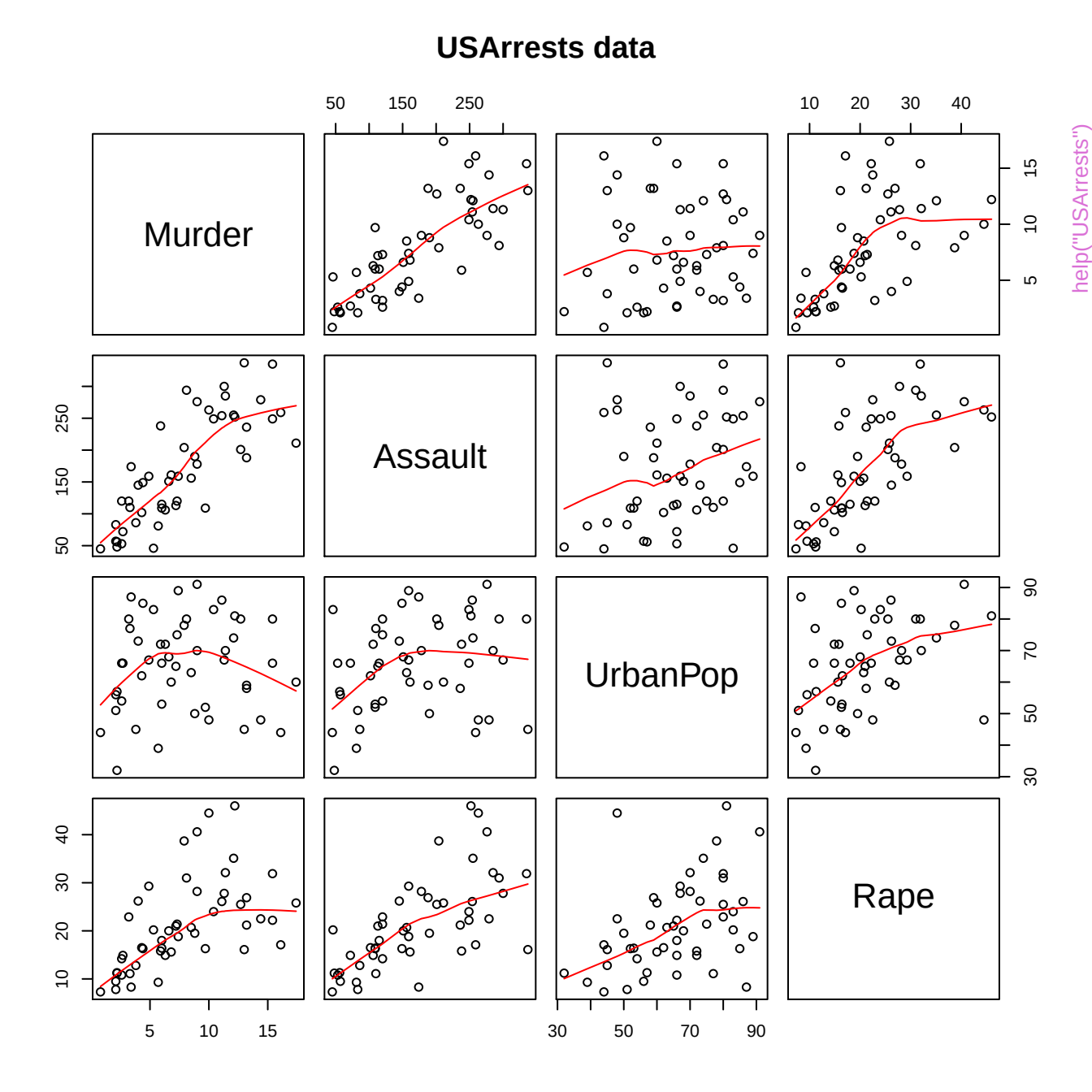

3.4
3.3
3.2
3.1
1970
1975
1980
1985
Time
help("UKDriverDeaths")


ldeaths
1500
2000
2500
3000
3500
1974
1975
1976
1977
1978
1979
1980
Time
help("UKLungDeaths")

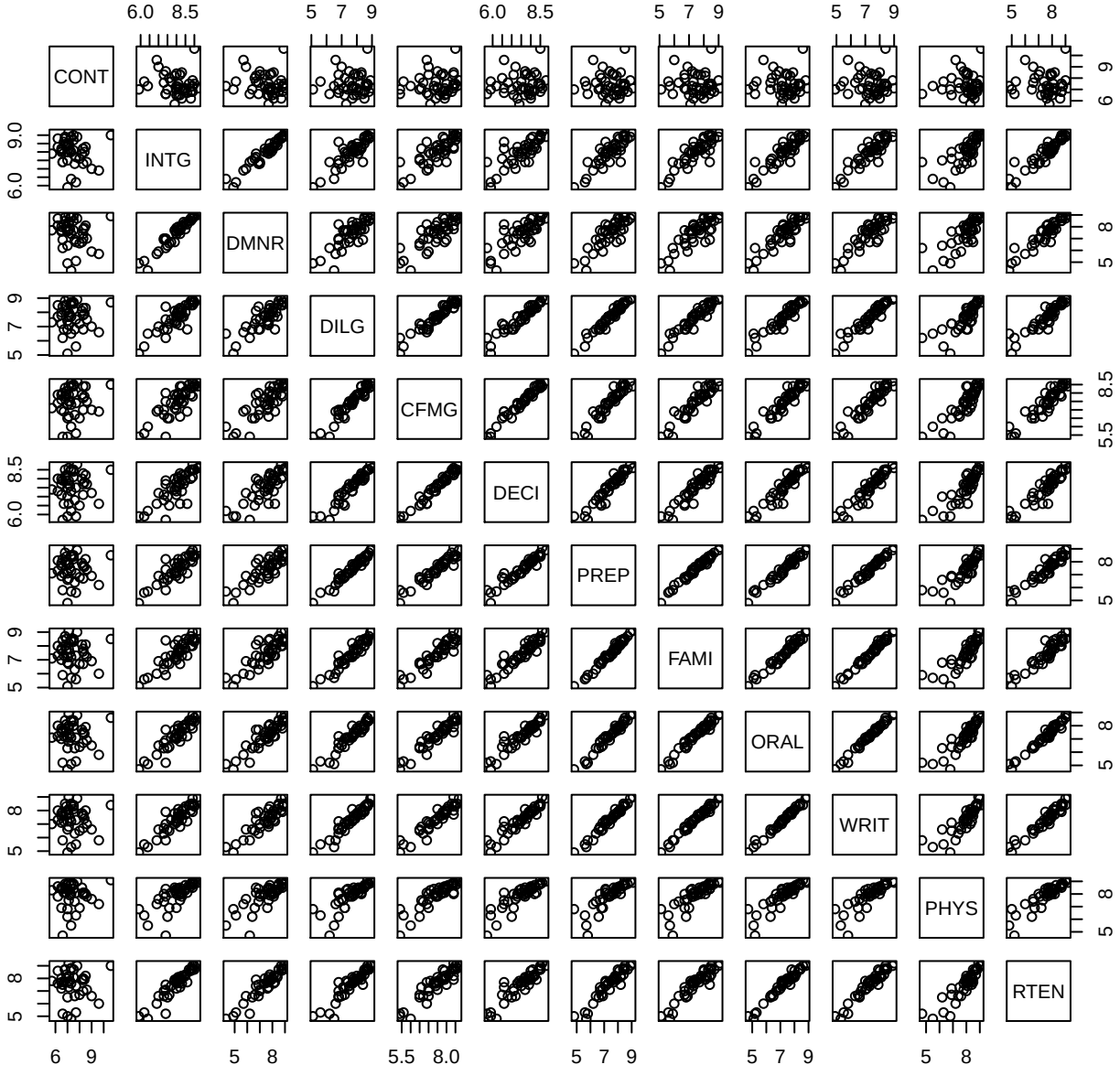


fdeaths
mdeaths
1000
800
600
400
1000
1500
2000
2500
1976
1974
1976
1977
1978
1975
1979
1974
1979
1978
1975
1975
1979
1978
1977
1979
1980
1975
1975
1976
1974
1977
1980
1975
1976
1977
1976
1977
help("UKLungDeaths")

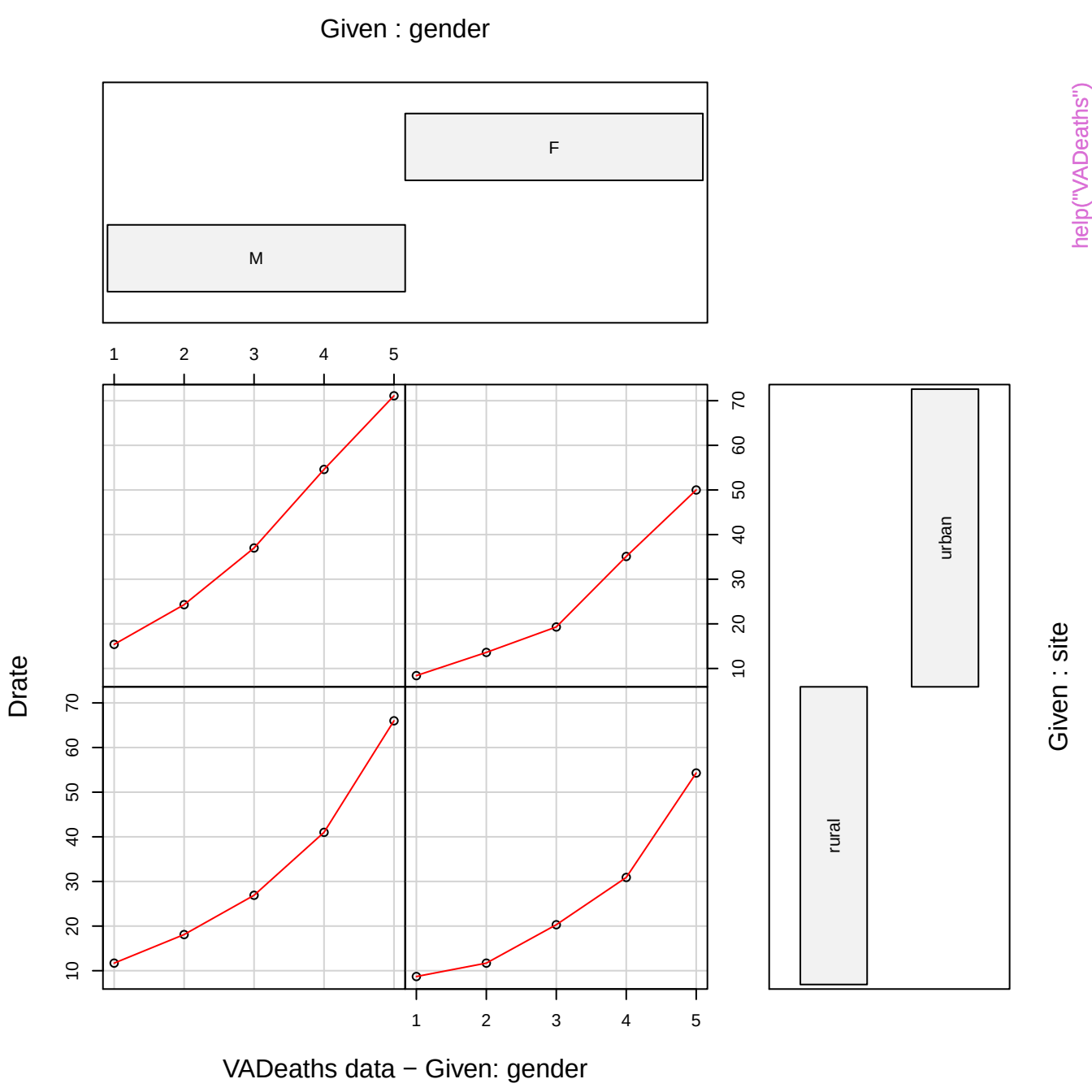

help("UKLungDeaths")
fdeaths
mdeaths
400
600
800
1000
1000
1500
2000
2500
Apr'76
Jan'74
May'76
Apr'77
Jun'78
Mar'74
Feb'75
Jun'79
Jul'79
Apr'75
Mar'75
Aug'79
Sep'79
Jun'79
Nov'74
May'79
Oct'79
Jun'75
Oct'76
Nov'75


USArrests data
Murder
Assault
UrbanPop
Rape
50
150
250
10
20
30
40
5
10
15
50
150
250
30
50
70
90
10
20
30
40
5
10
15
30
50
70
90
help("USArrests")

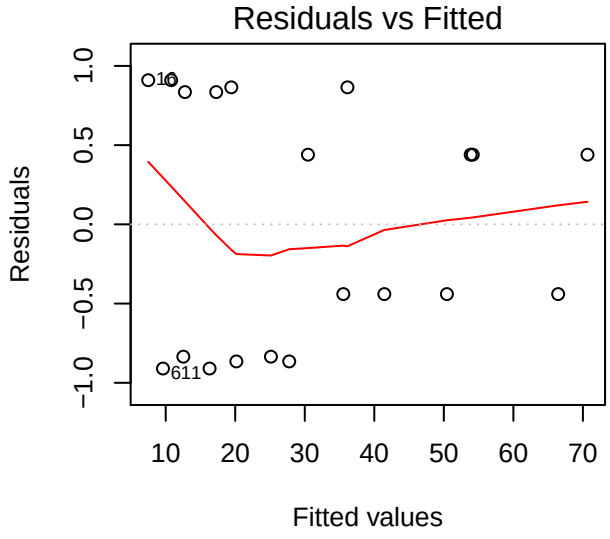
USJudgeRatings data

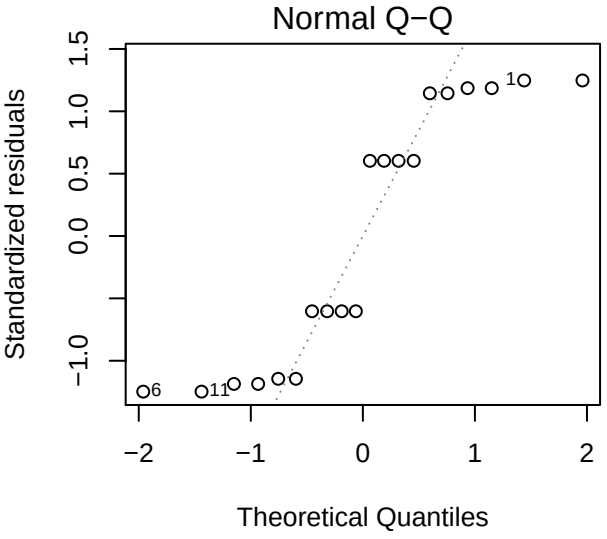


help("USJudgeRatings")

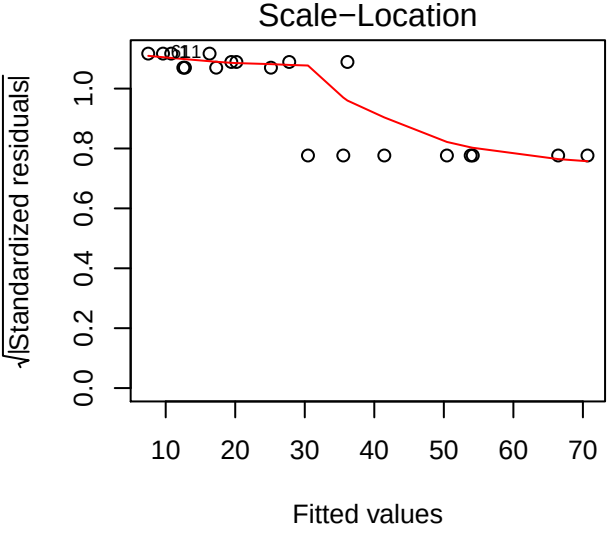

Given : gender
F
M
1
2
3
4
5
10
20
30
40
50
60
70
Drate
Given : site
urban
rural
VADeaths data − Given: gender
help("VADeaths")

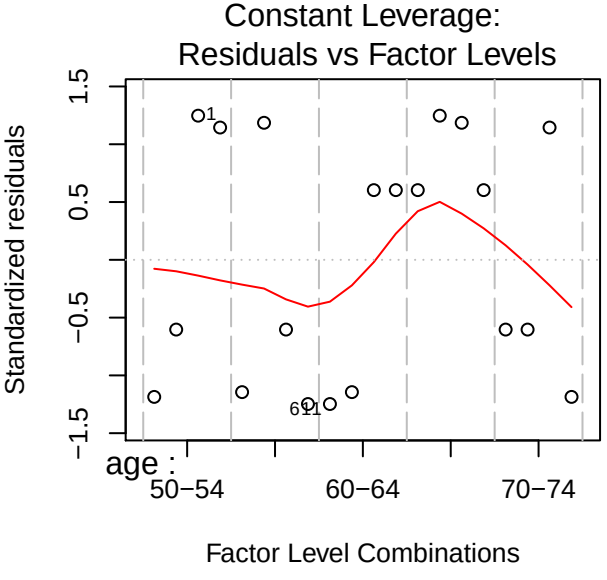
aov(Drate ~ .^2)

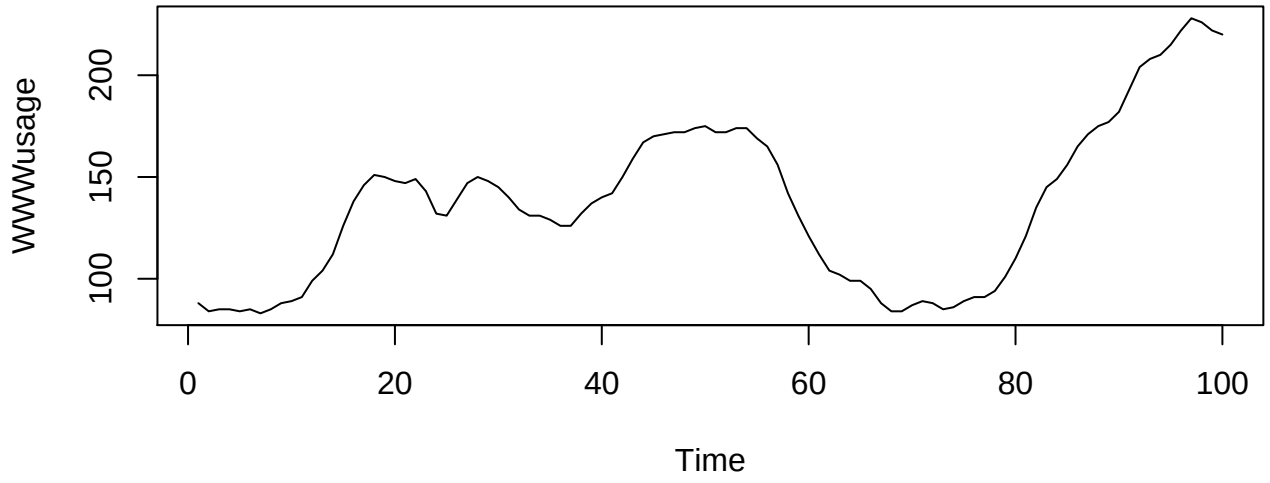




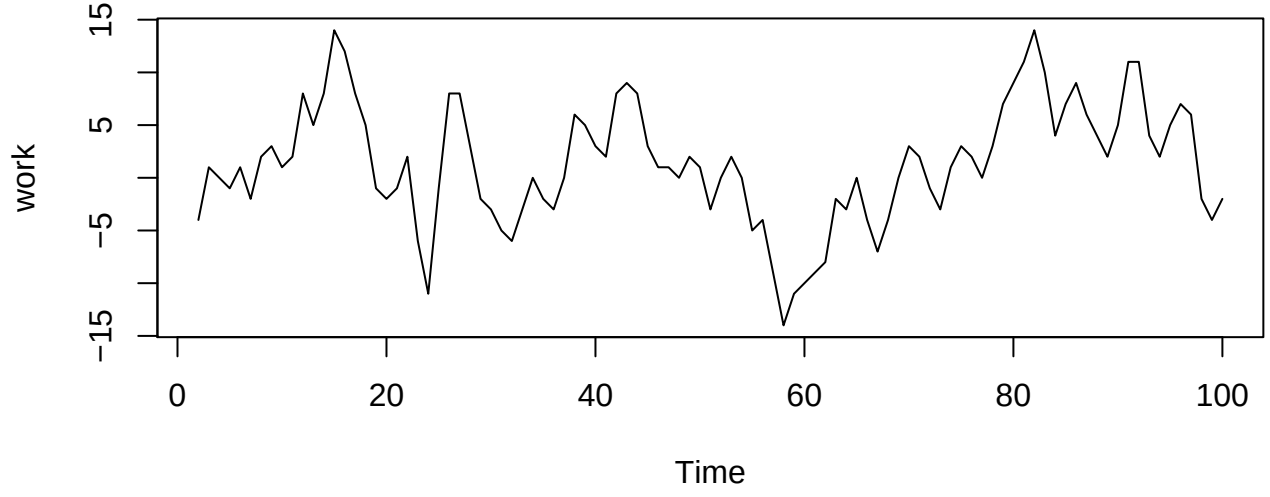
help("VADeaths")

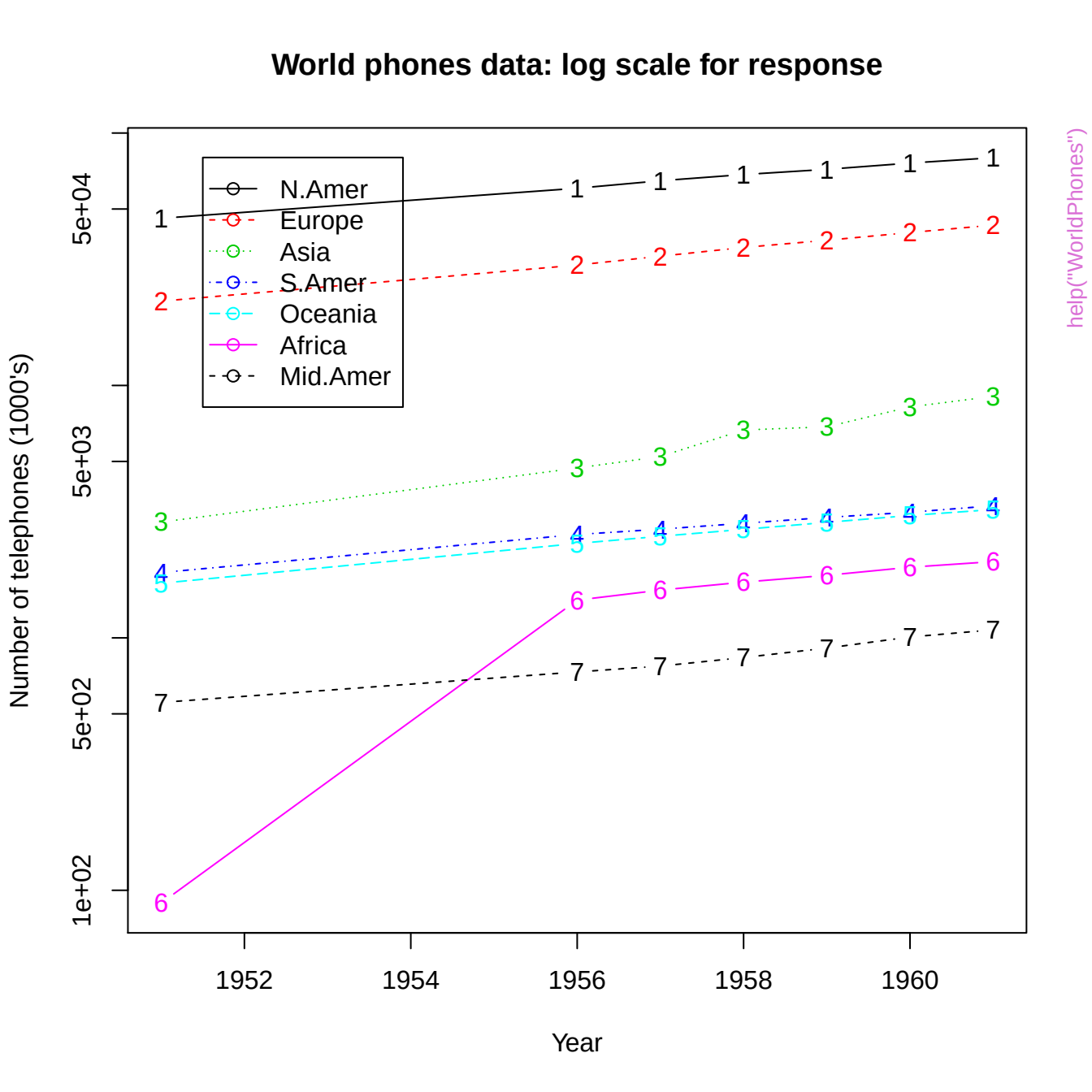


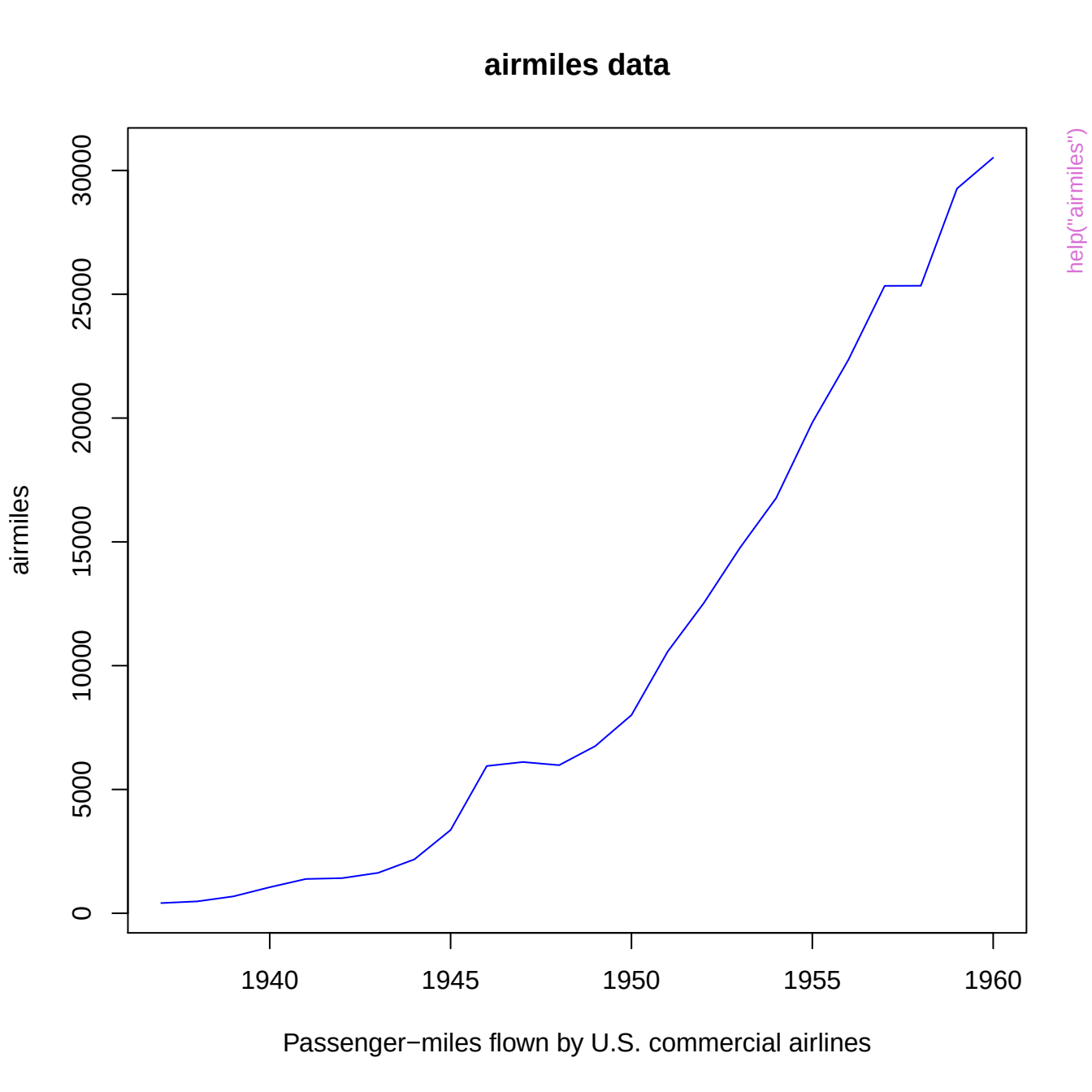


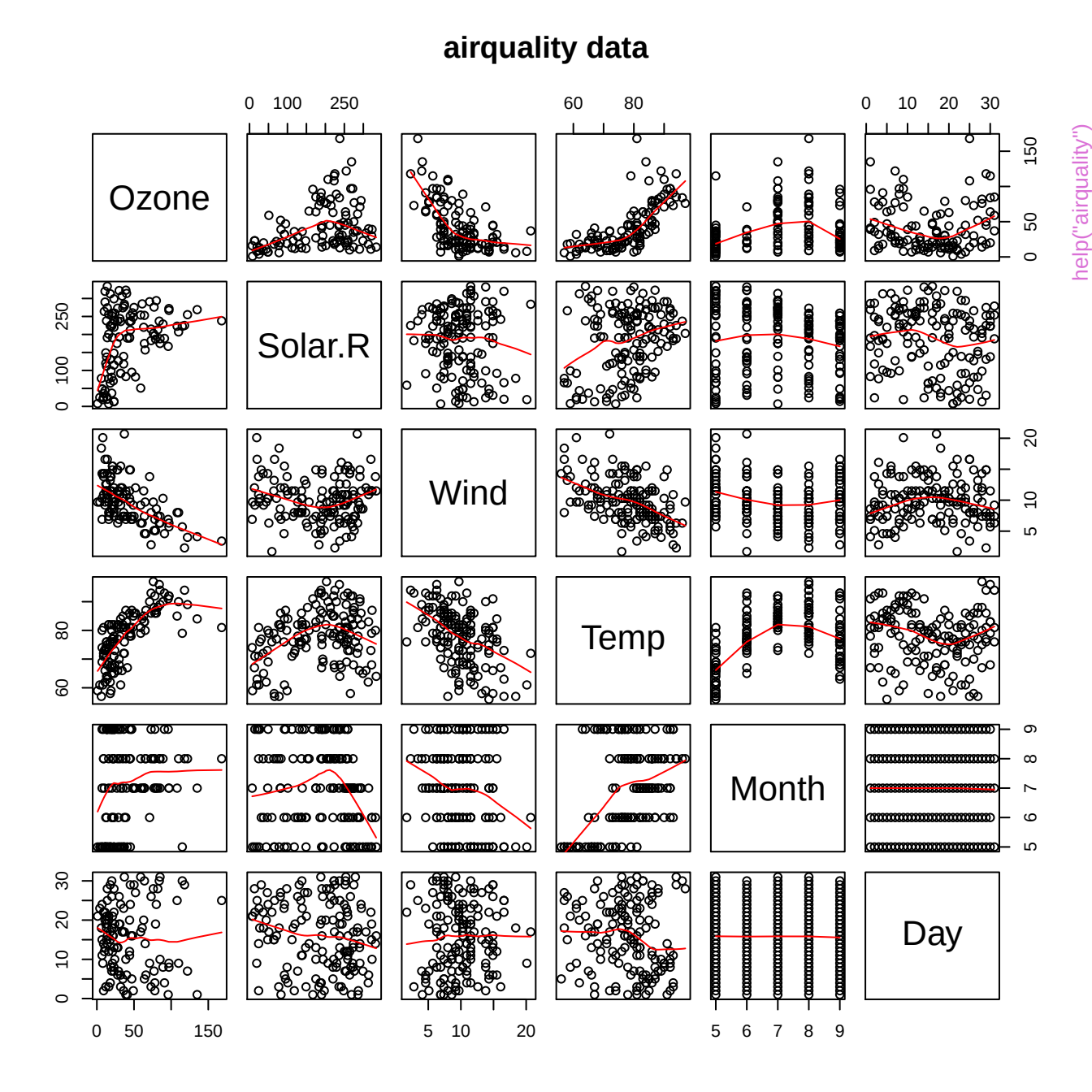


help("WWWusage")

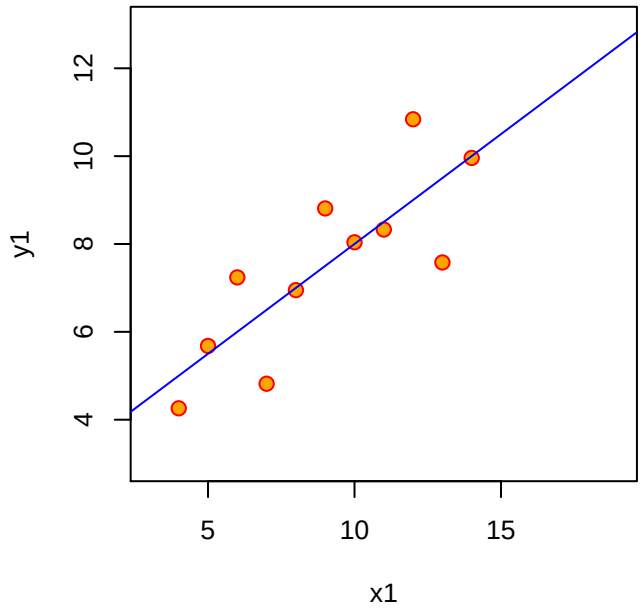


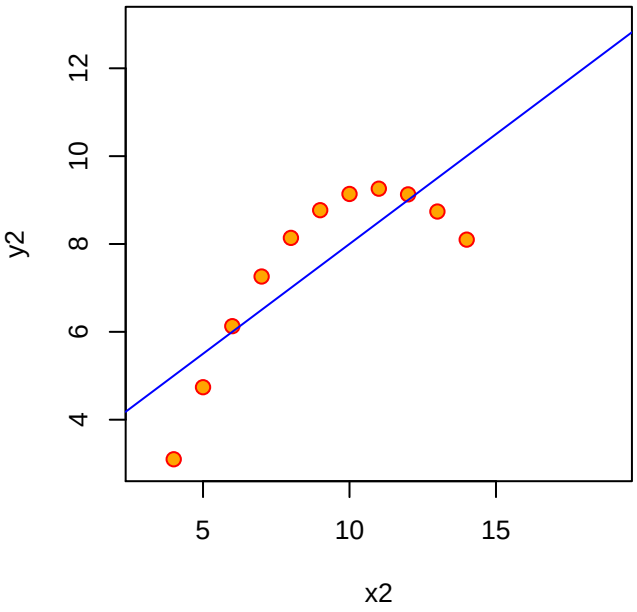

World phones data: log scale for response
N.Amer
Europe
Asia
S.Amer
Oceania
Africa
Mid.Amer
Number of telephones (1000's)
1e+02
5e+02
5e+03
5e+04
1952
1954
1956
1958
1960
Year
help("WorldPhones")


airmiles data
airmiles
0
5000
10000
15000
20000
25000
30000
1940
1945
1950
1955
1960
Passenger−miles flown by U.S. commercial airlines
help("airmiles")

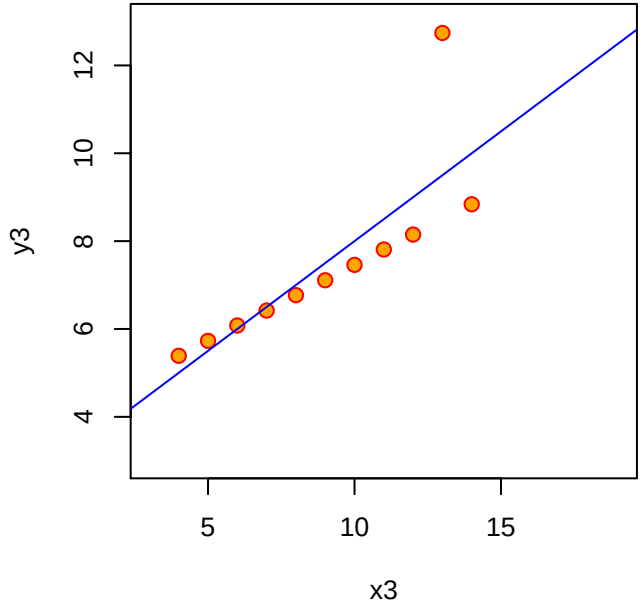

airquality data
Ozone
Solar.R
Wind
Temp
Month
Day
help("airquality")

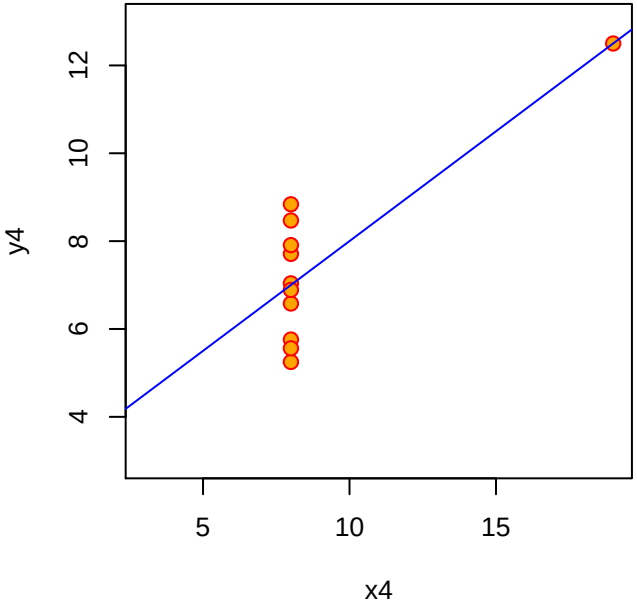
Anscombe's 4 Regression data sets

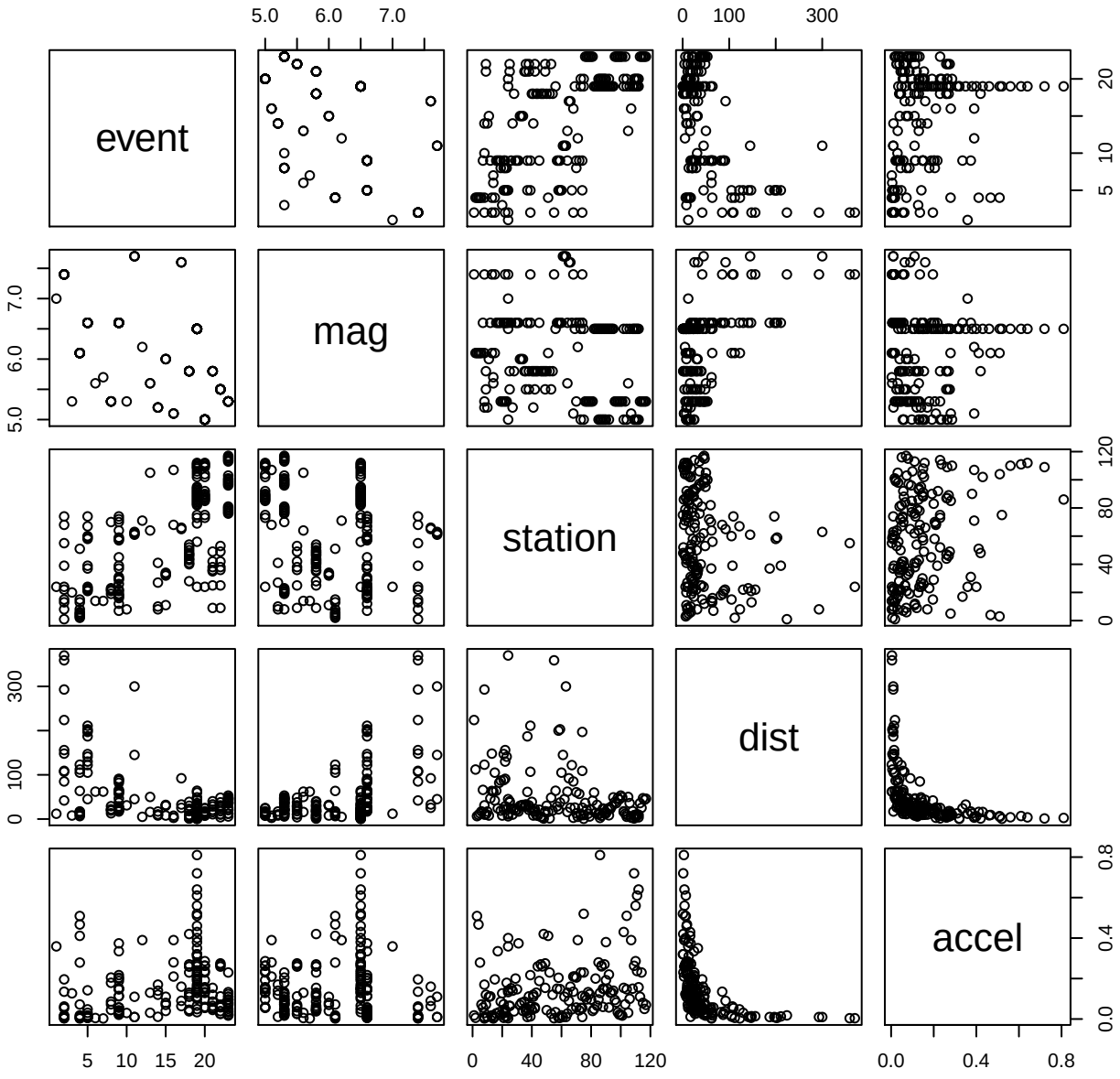


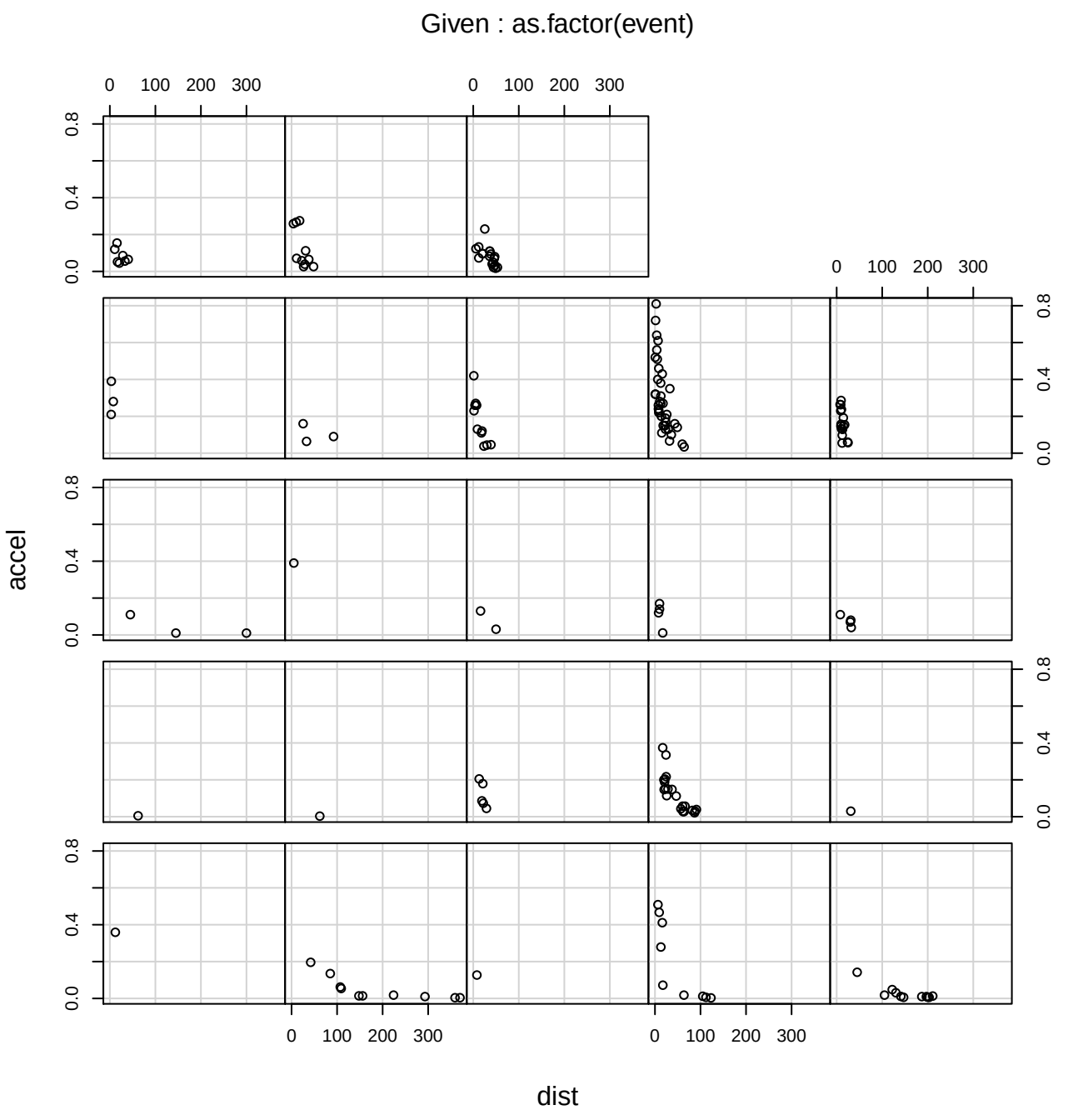


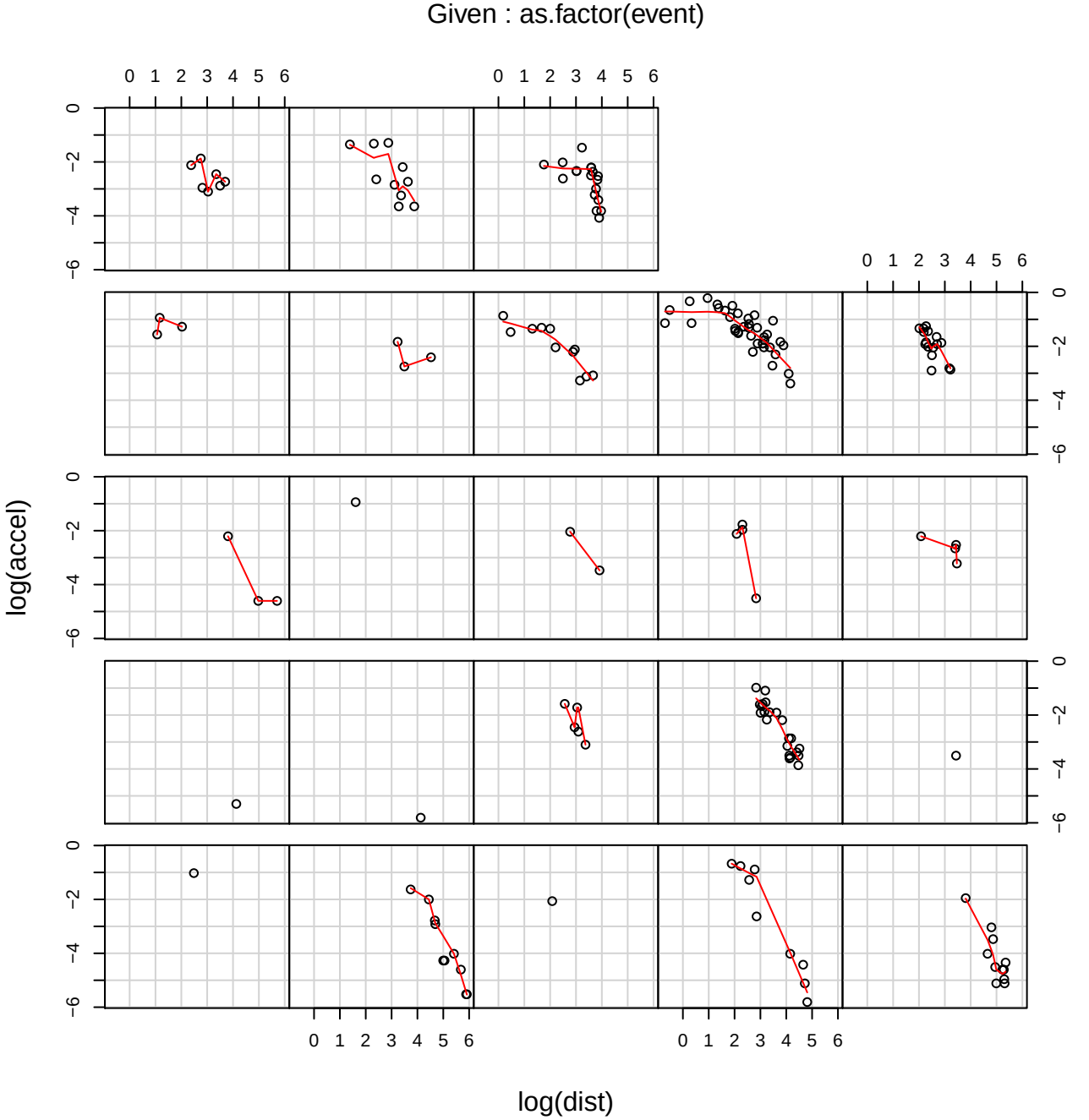
help("anscombe")

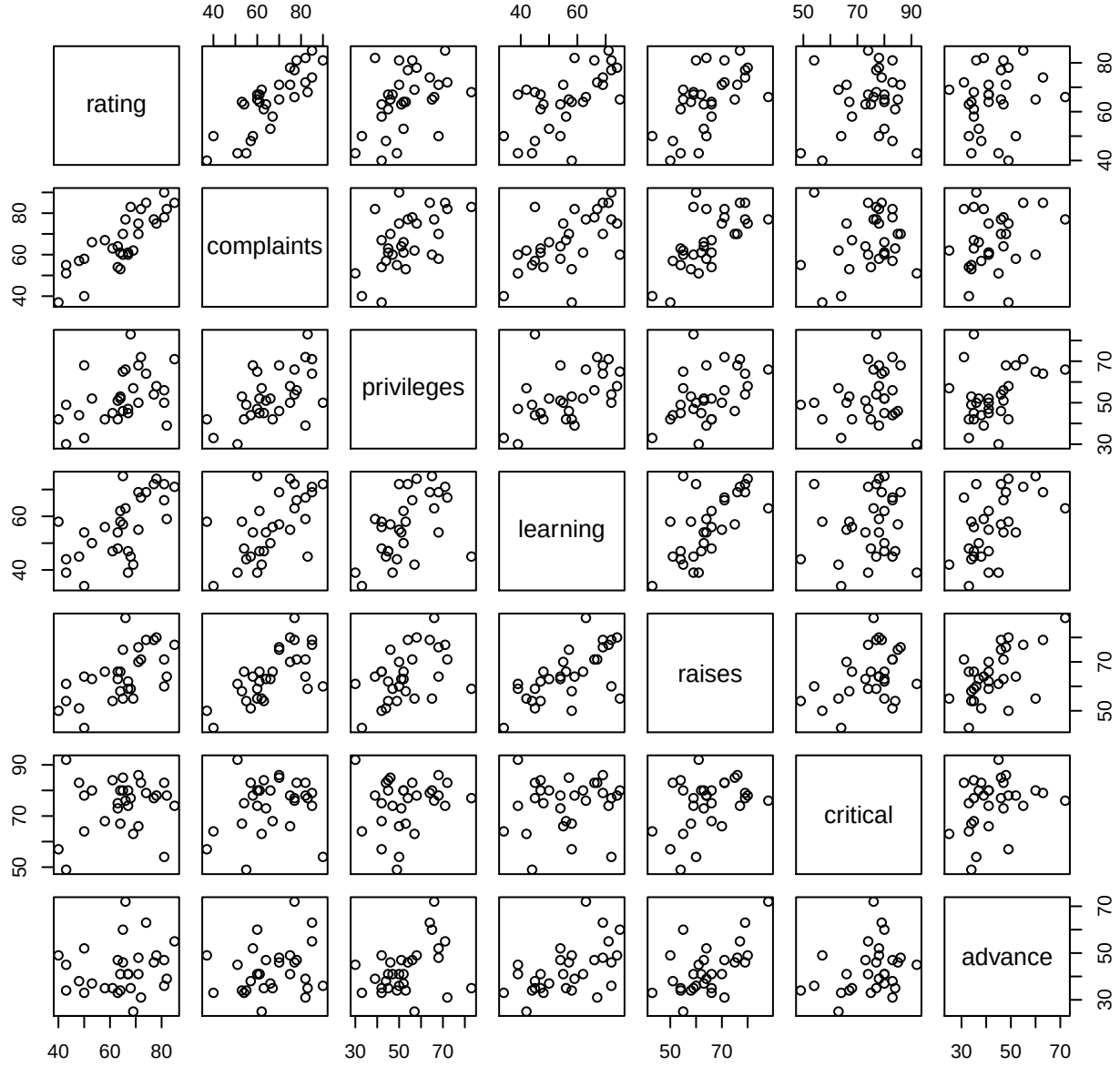


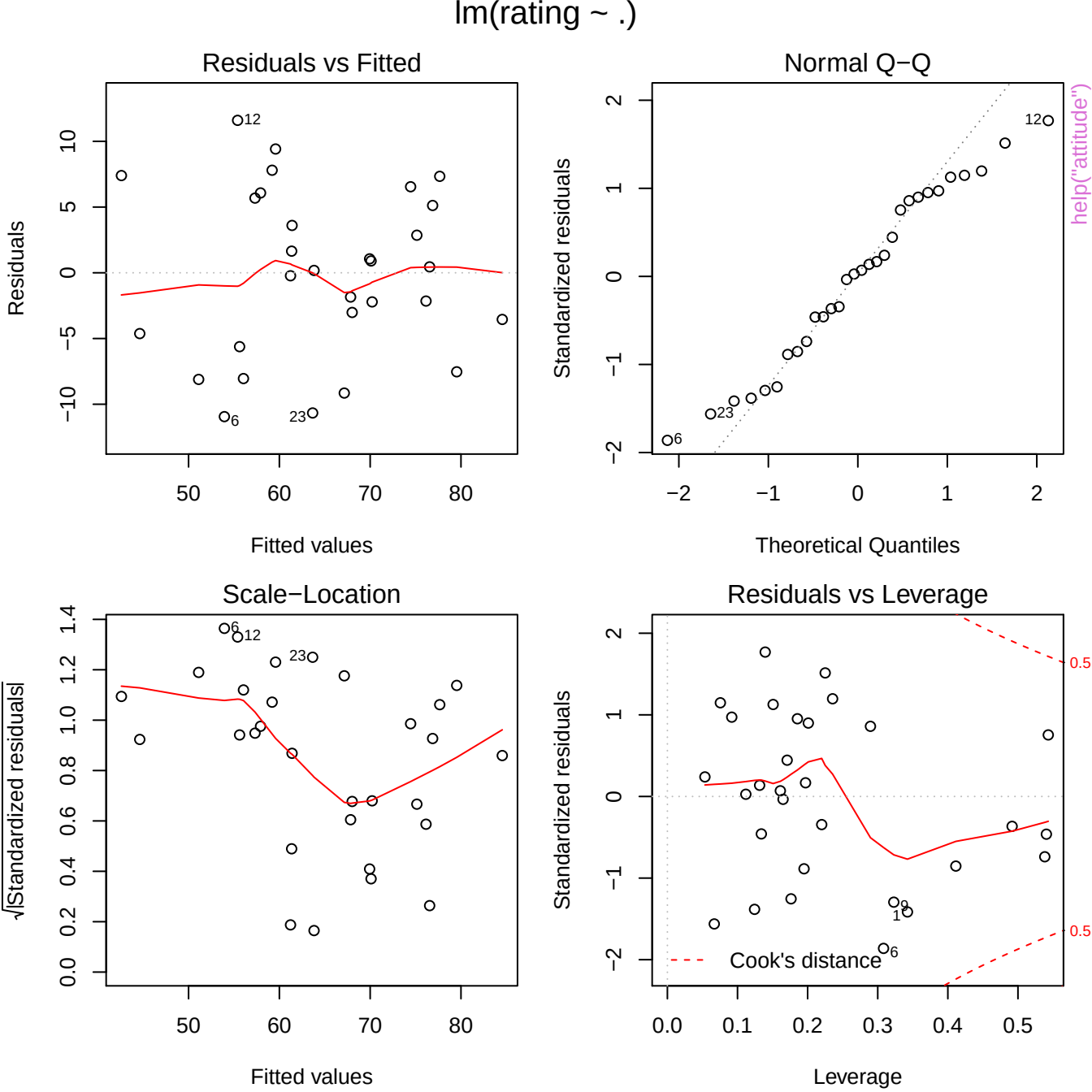


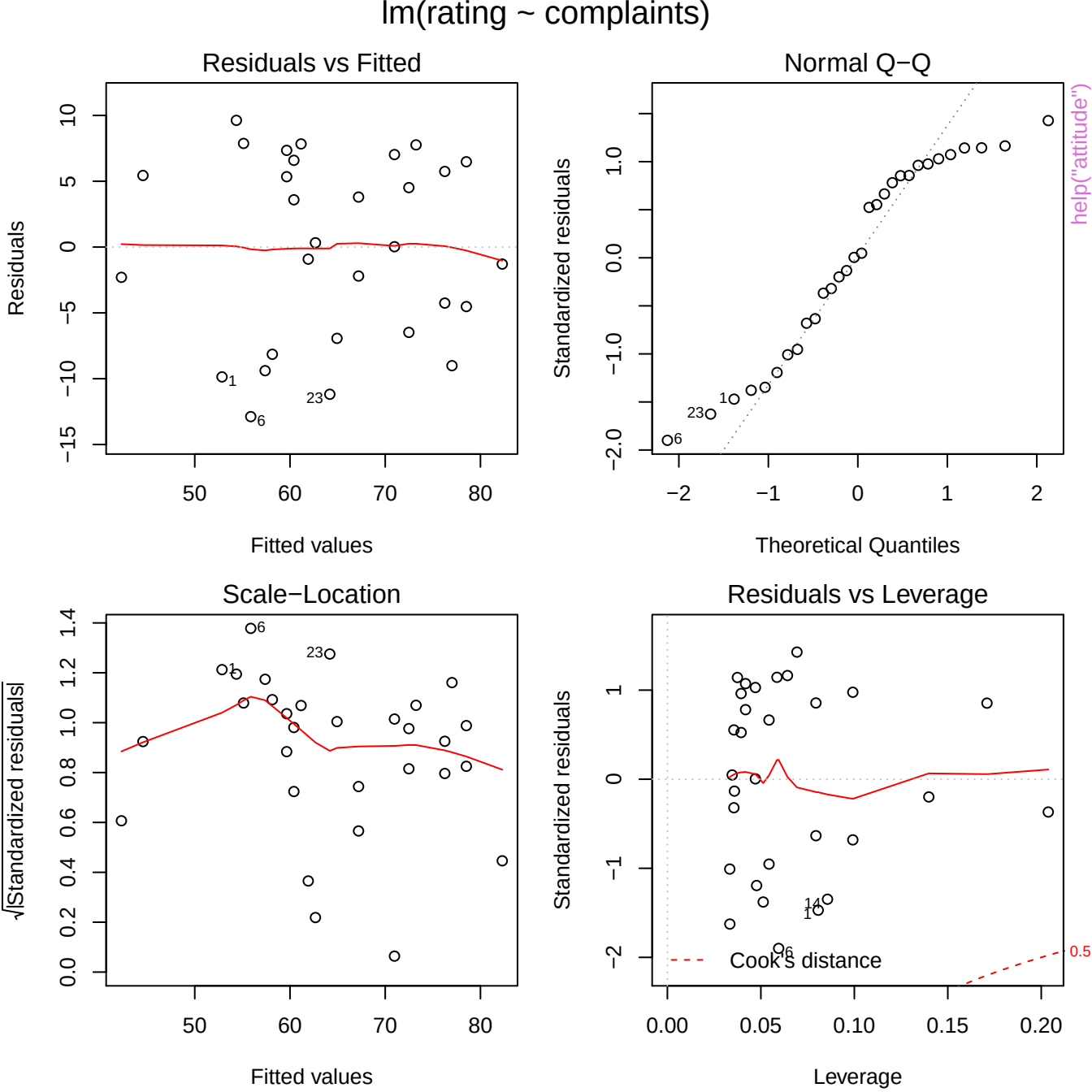

attenu data
event
mag
station
dist
accel
5.0
6.0
7.0
0
100
300
5
10
20
40
80
120
0.0
0.4
0.8
15
help("attenu")

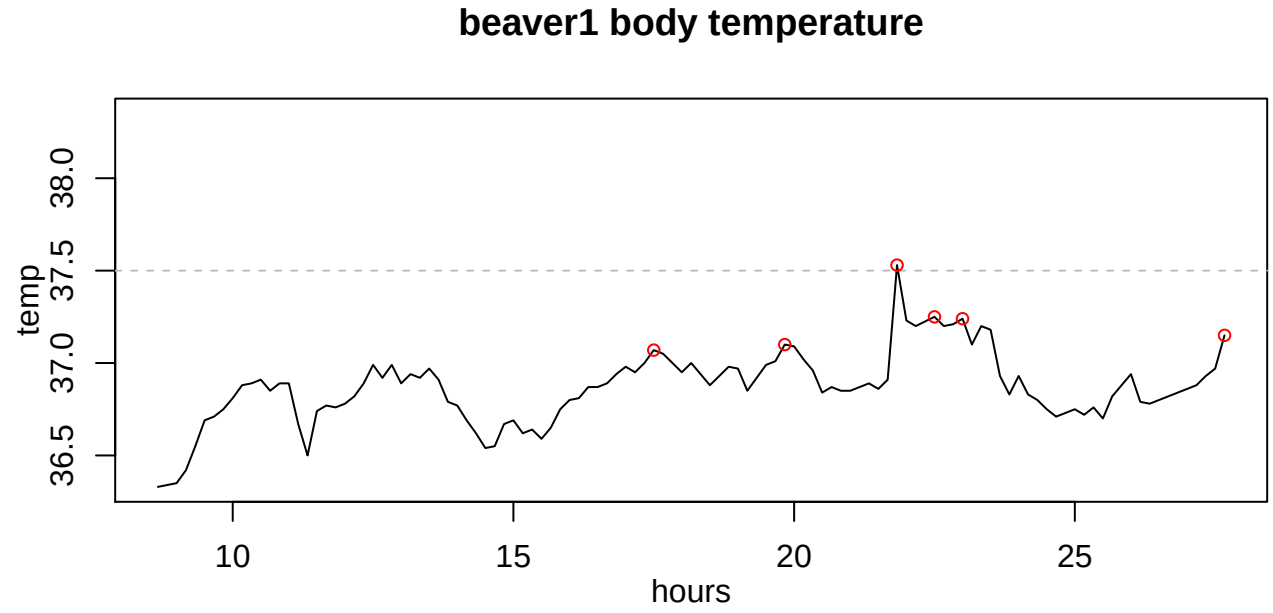

Given : as.factor(event)
accel
dist
0
100
200
300
0.0
0.4
0.8


Given : as.factor(event)
log(accel)
log(dist)
0 1 2 3 4 5 6
0 −2 −4 −6

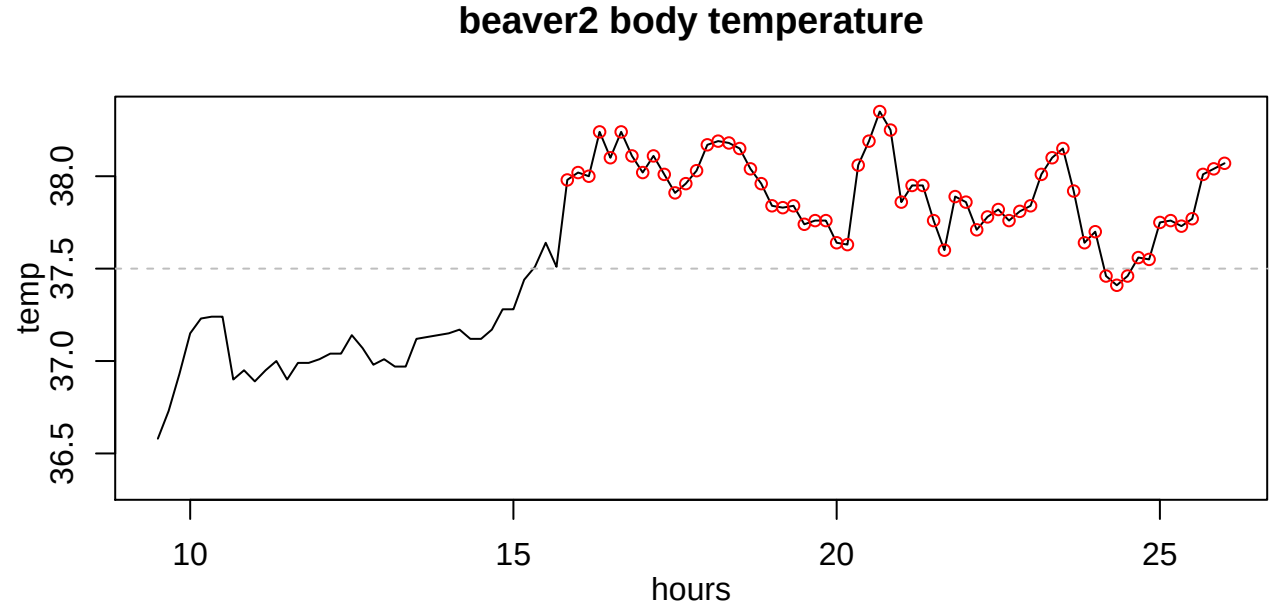

attitude data
rating
complaints
privileges
learning
raises
critical
advance
help("attitude")

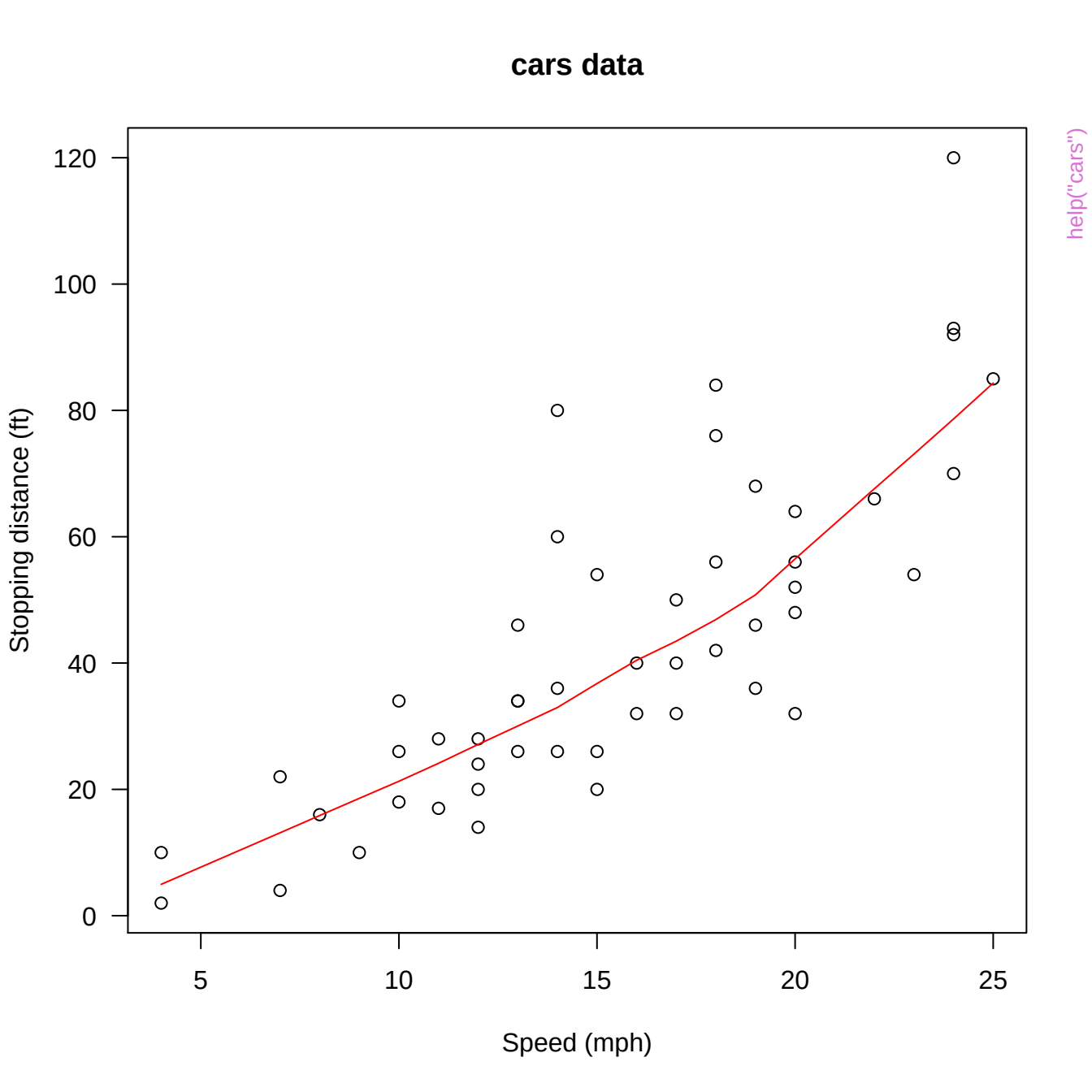

lm(rating ~ .)
Residuals vs Fitted
Residuals
Fitted values
12
6
23
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("attitude")
Scale−Location
√|Standardized residuals|
Residuals vs Leverage
Cook's distance
Leverage

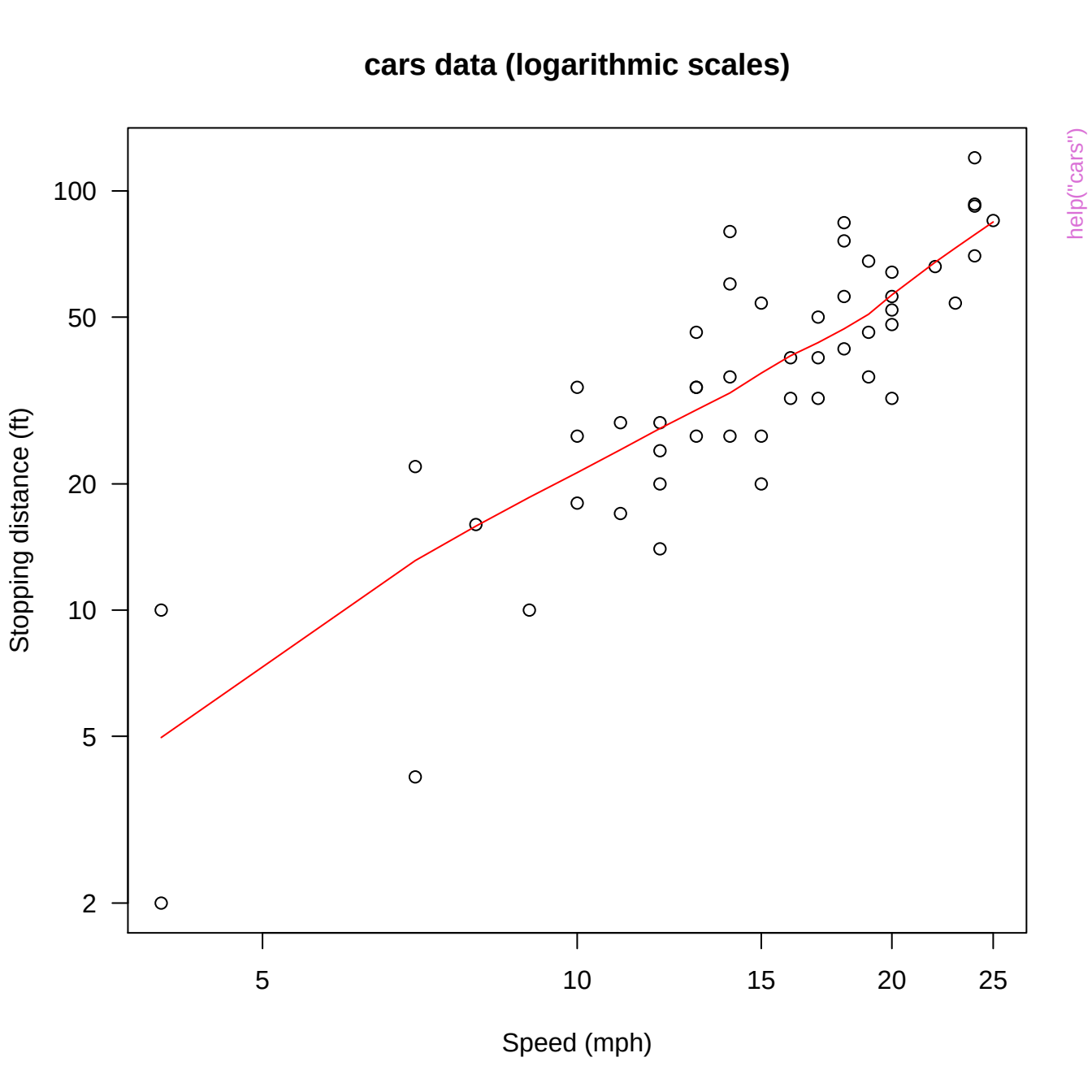

lm(rating ~ complaints)
Residuals vs Fitted
Residuals
Fitted values
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("attitude")
Scale−Location
√|Standardized residuals|
Fitted values
Residuals vs Leverage
Standardized residuals
Leverage
Cook's distance
0.5

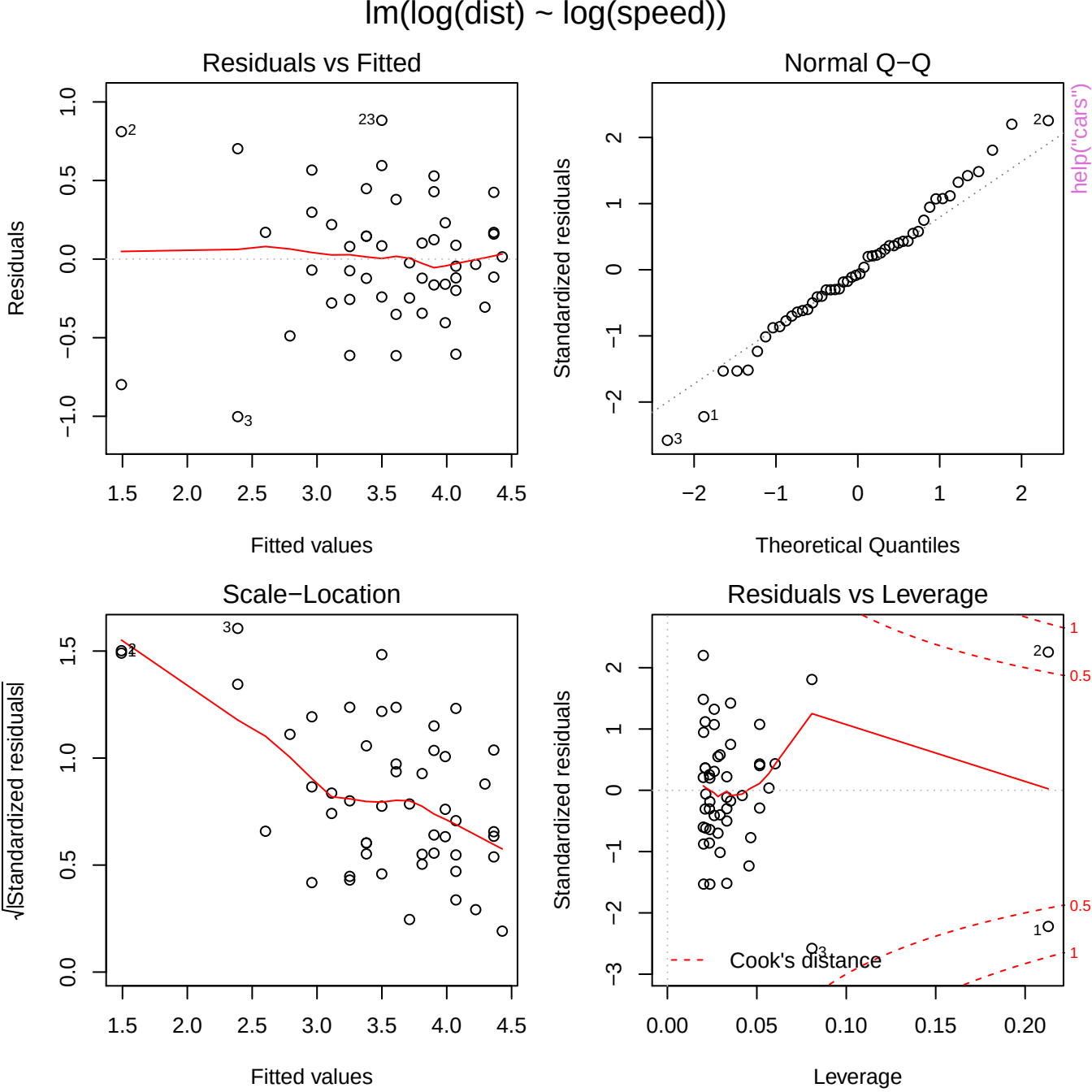


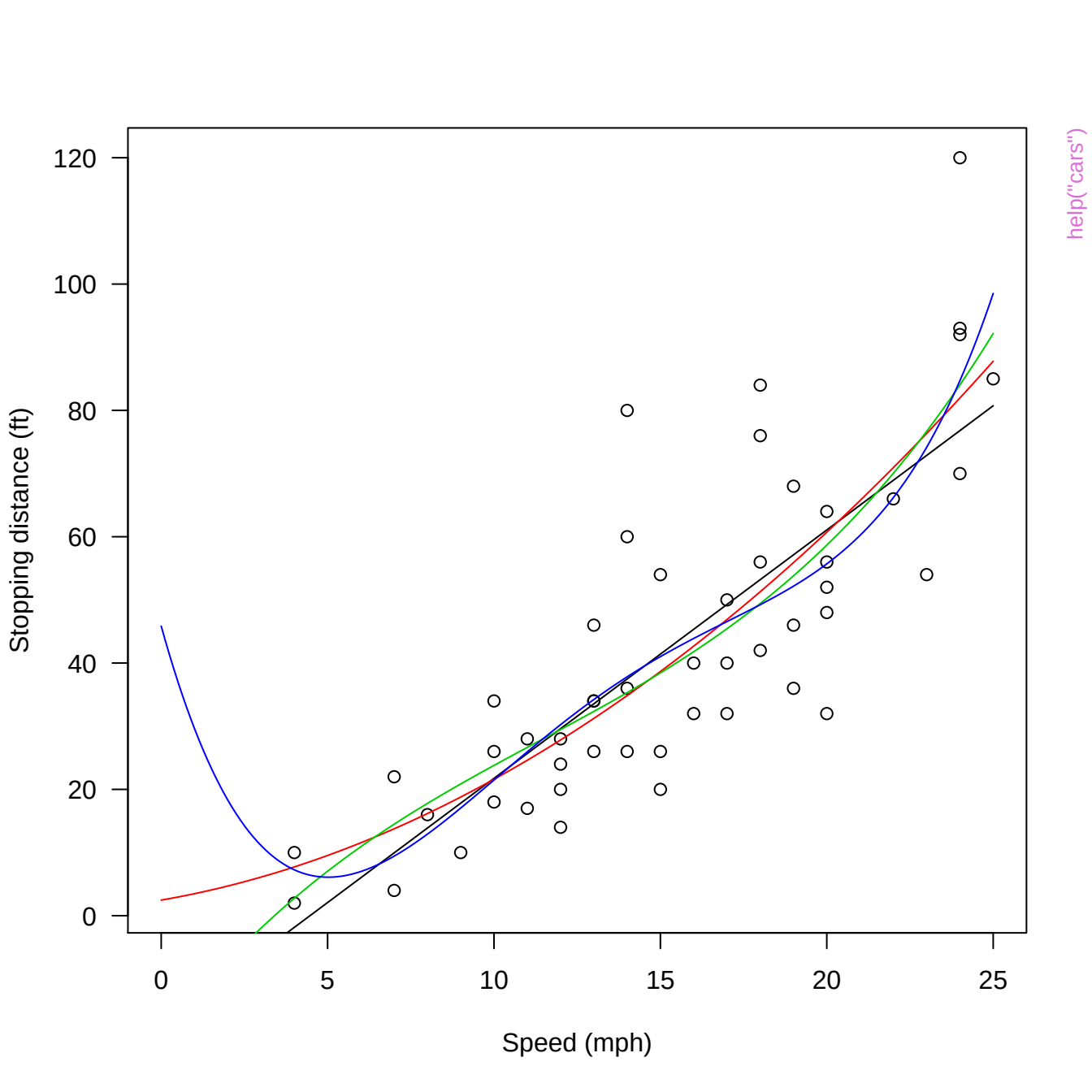
help("beavers")

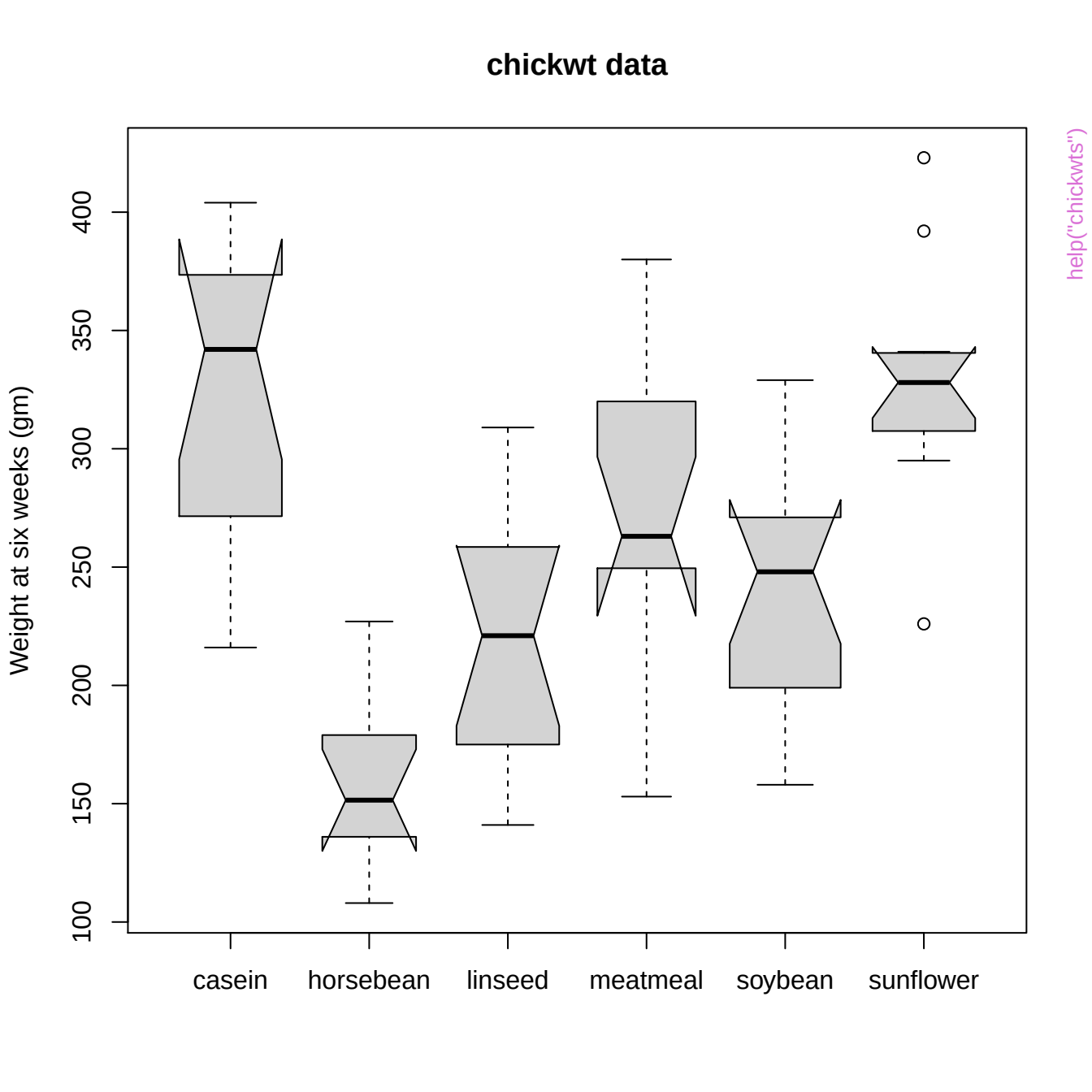


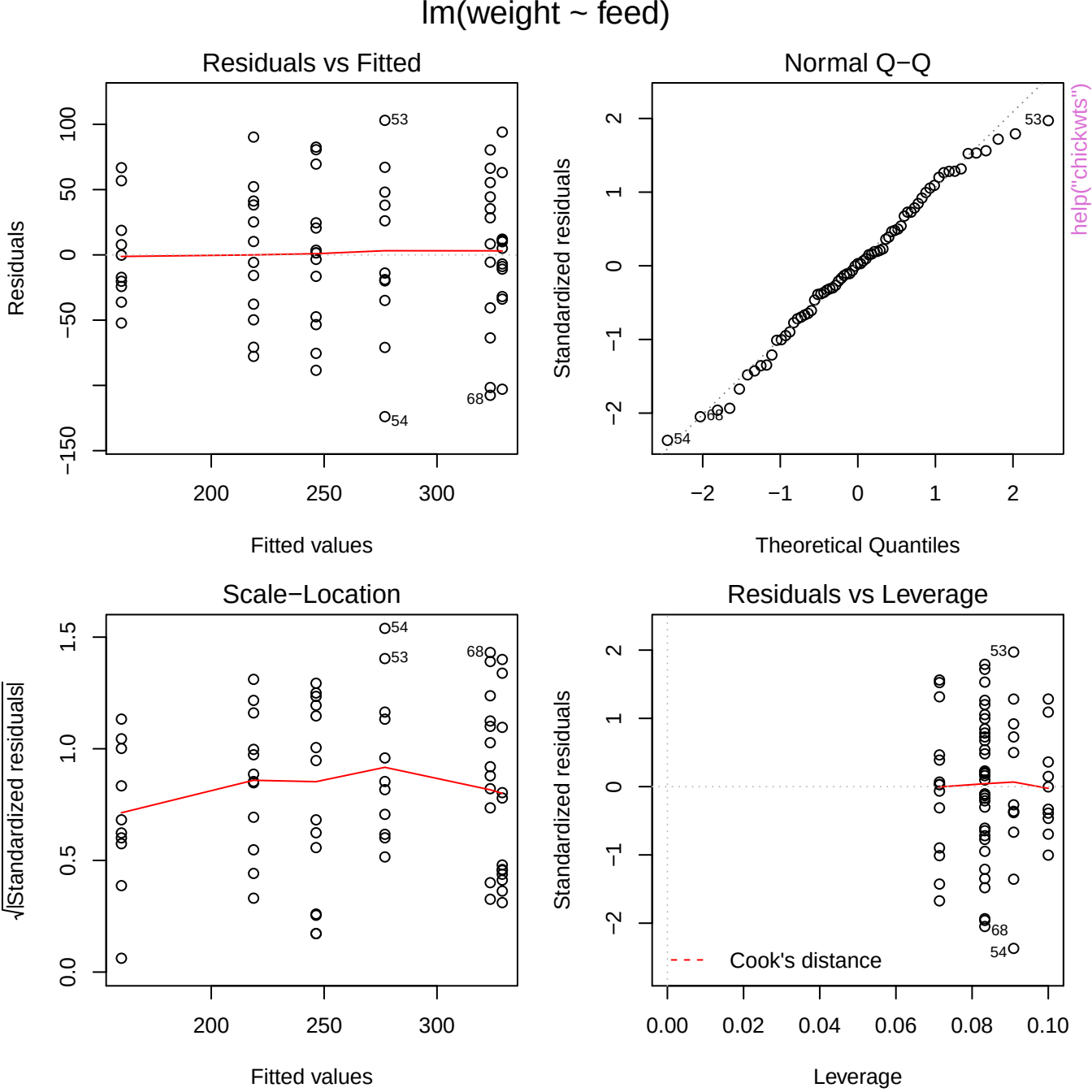

cars data
Stopping distance (ft)
Speed (mph)
0
20
40
60
80
100
120
5
10
15
20
25
help("cars")

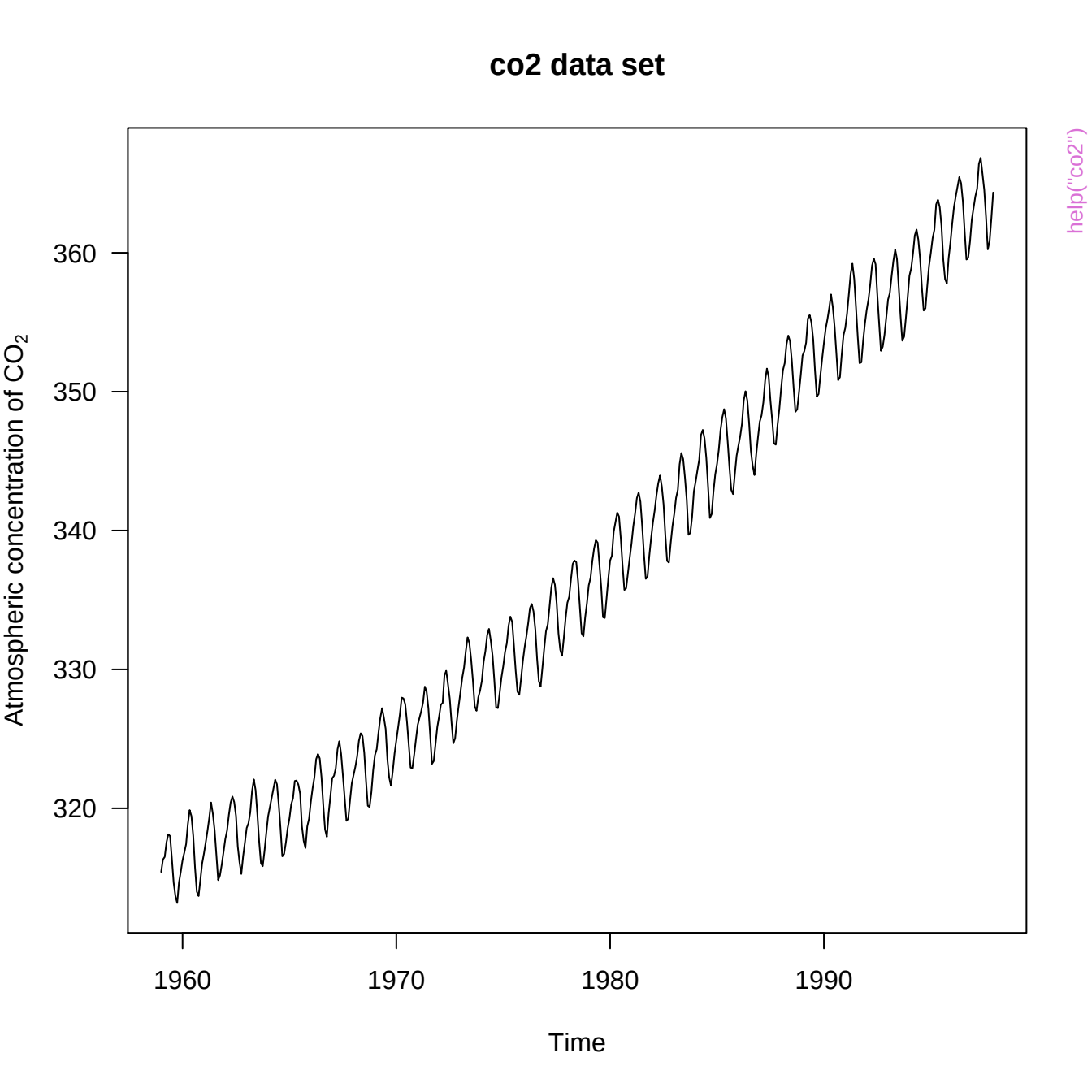

cars data (logarithmic scales)
Stopping distance (ft)
100
50
20
10
5
2
5
10
15
20
25
Speed (mph)
help("cars")

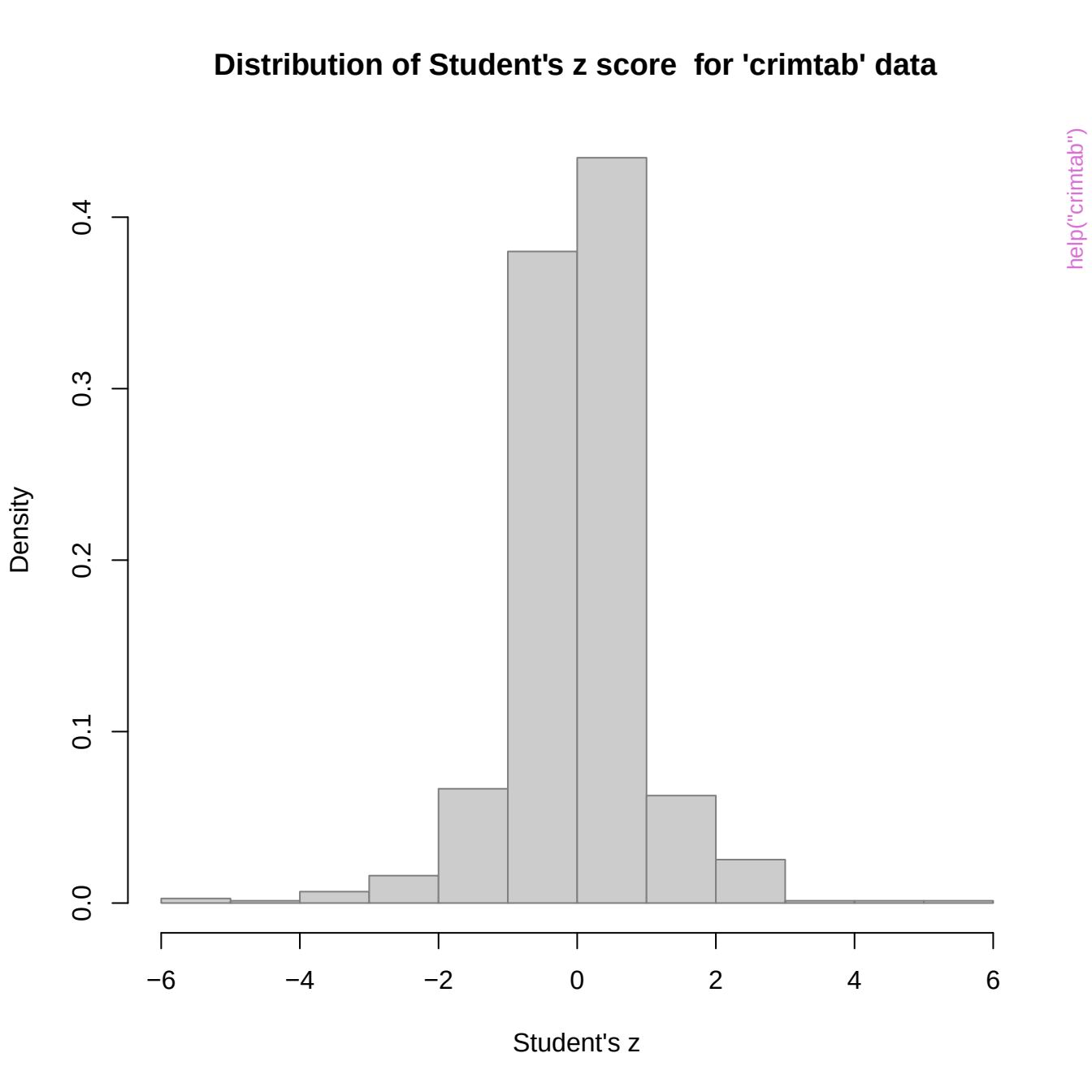

lm(log(dist) ~ log(speed))
Residuals vs Fitted
Residuals
Fitted values
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("cars")
Scale−Location
√|Standardized residuals|
Fitted values
Residuals vs Leverage
Standardized residuals
Leverage
Cook's distance

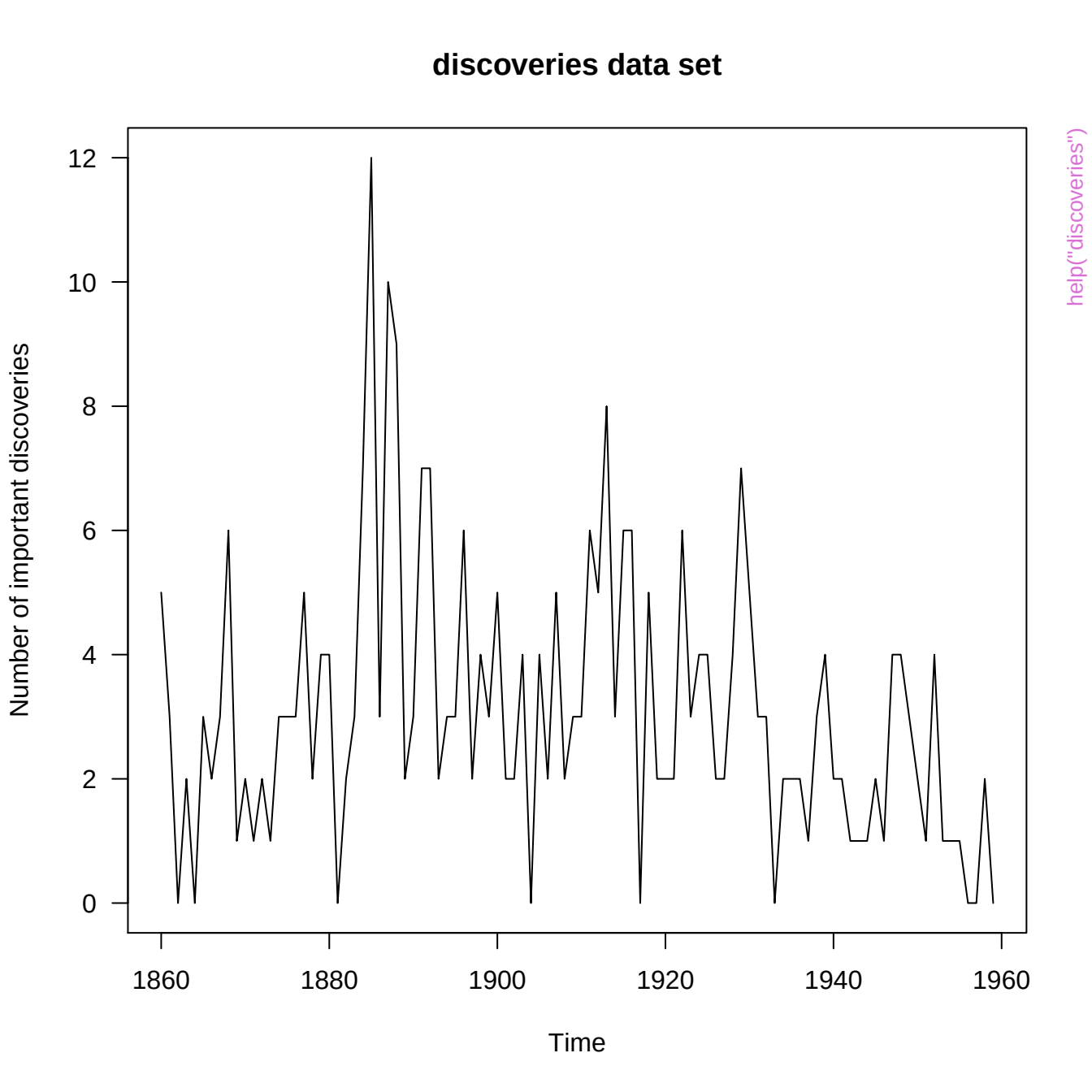

help("cars")
Stopping distance (ft)
Speed (mph)
0
20
40
60
80
100
120
0
5
10
15
20
25


chickwt data
Weight at six weeks (gm)
100
150
200
250
300
350
400
casein
horsebean
linseed
meatmeal
soybean
sunflower
help("chickwts")

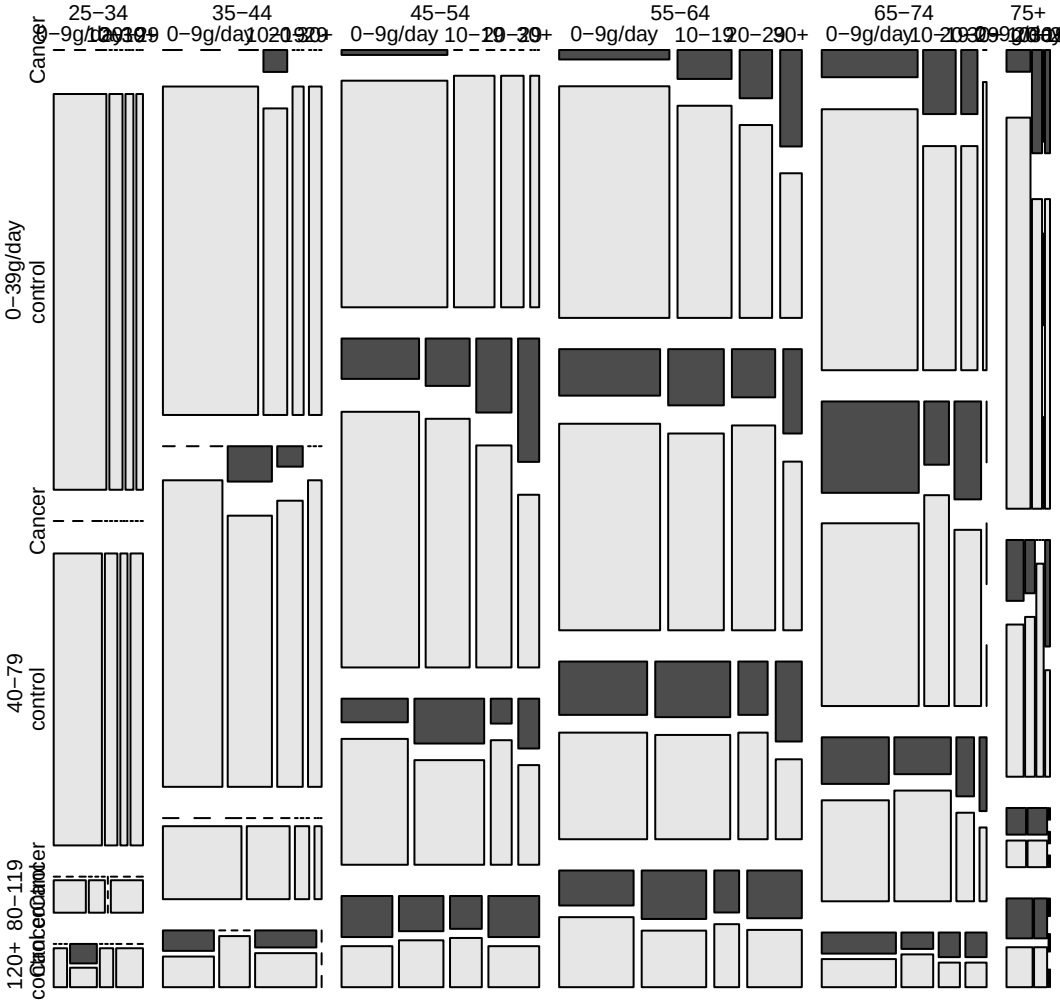

lm(weight ~ feed)
Residuals vs Fitted
Residuals
Fitted values
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("chickwts")
Scale−Location
√|Standardized residuals|
Fitted values
Residuals vs Leverage
Standardized residuals
Leverage
Cook's distance


co2 data set
help("co2")
Atmospheric concentration of CO_2
320
330
340
350
360
1960
1970
1980
1990
Time

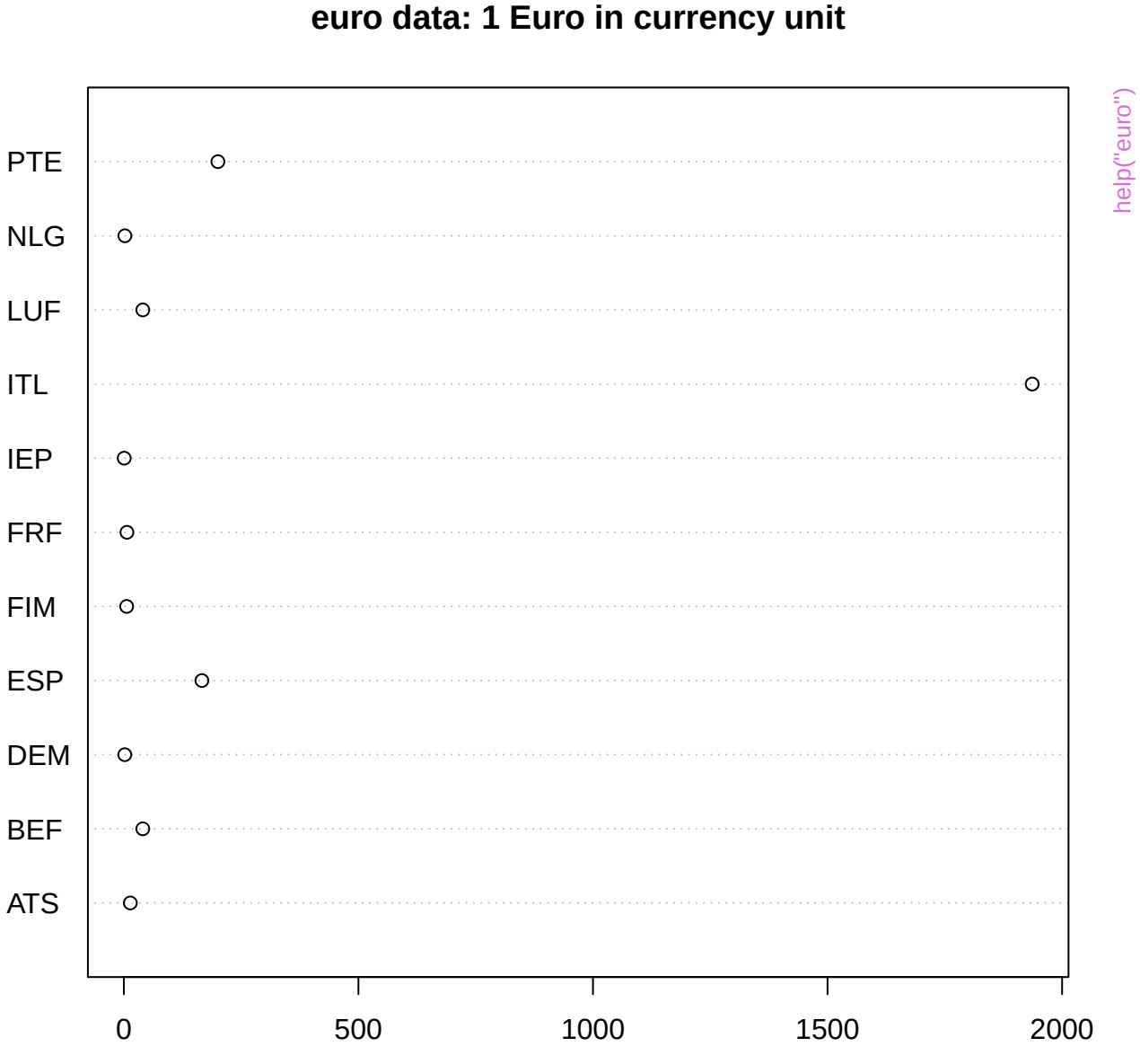

Distribution of Student's z score for 'crimtab' data
help("crimtab")
Density
0.0
0.1
0.2
0.3
0.4
−6
−4
−2
0
2
4
6
Student's z

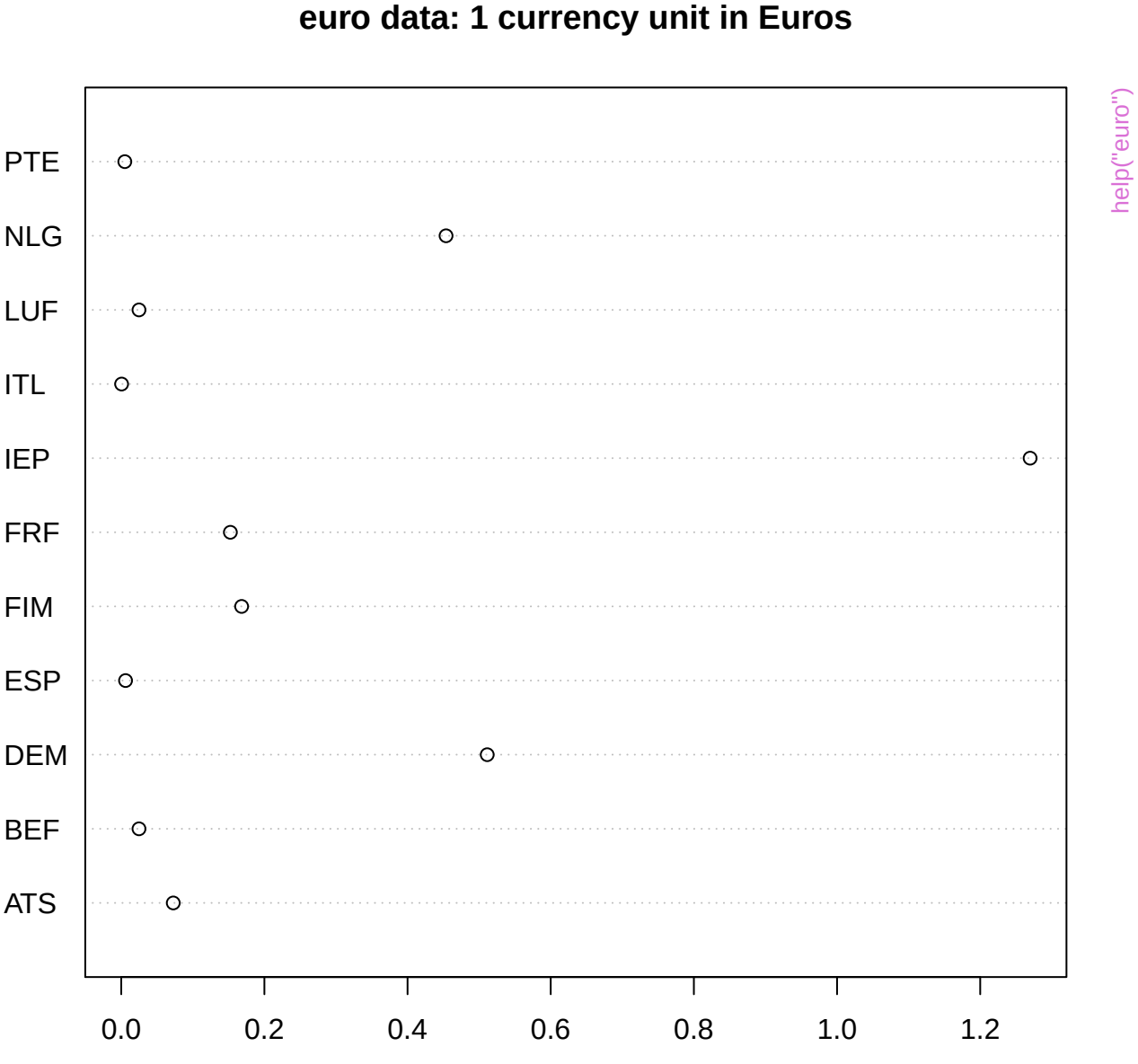

discoveries data set
Number of important discoveries
Time
0
2
4
6
8
10
12
1860
1880
1900
1920
1940
1960
help("discoveries")

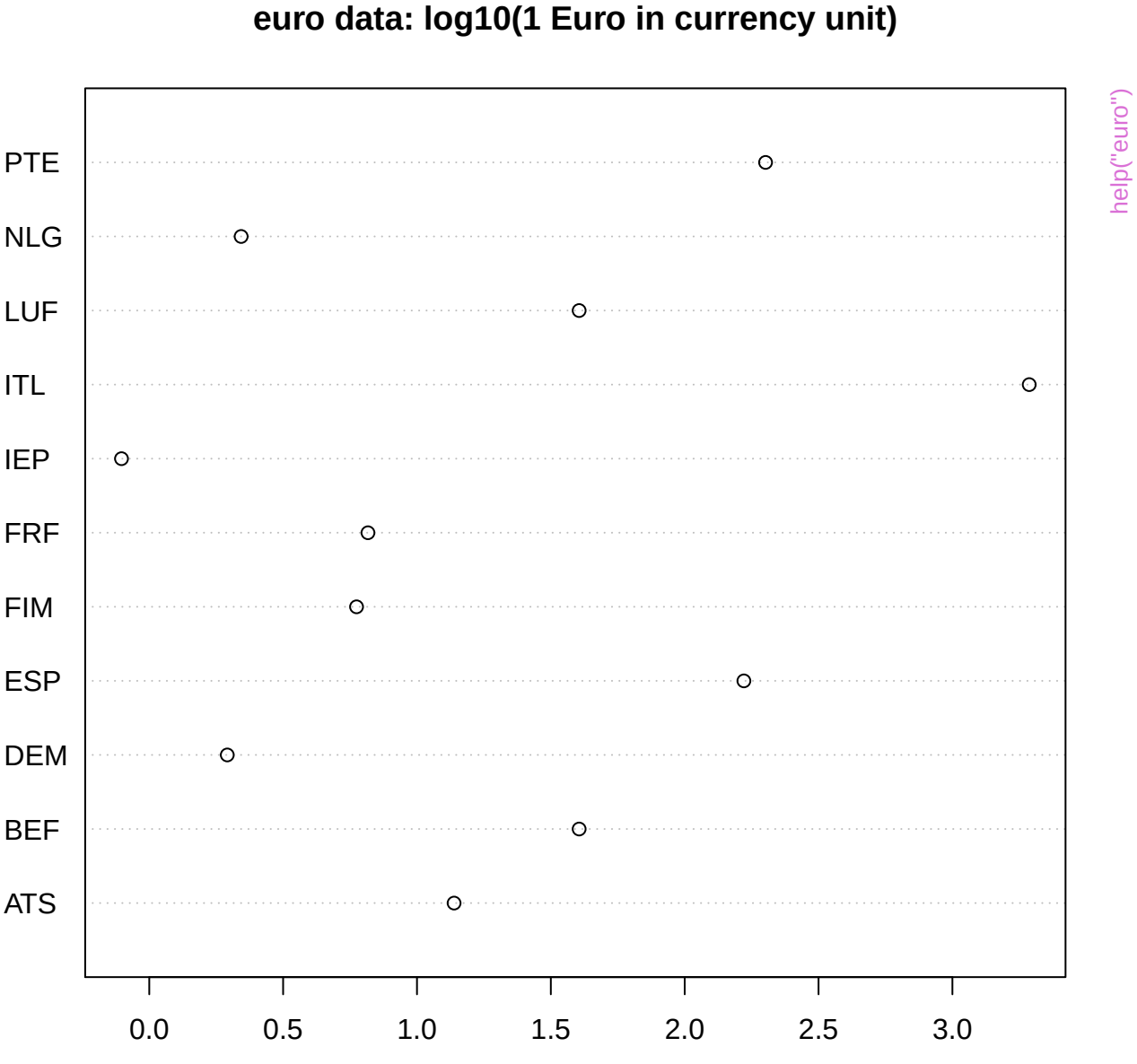
esoph data set

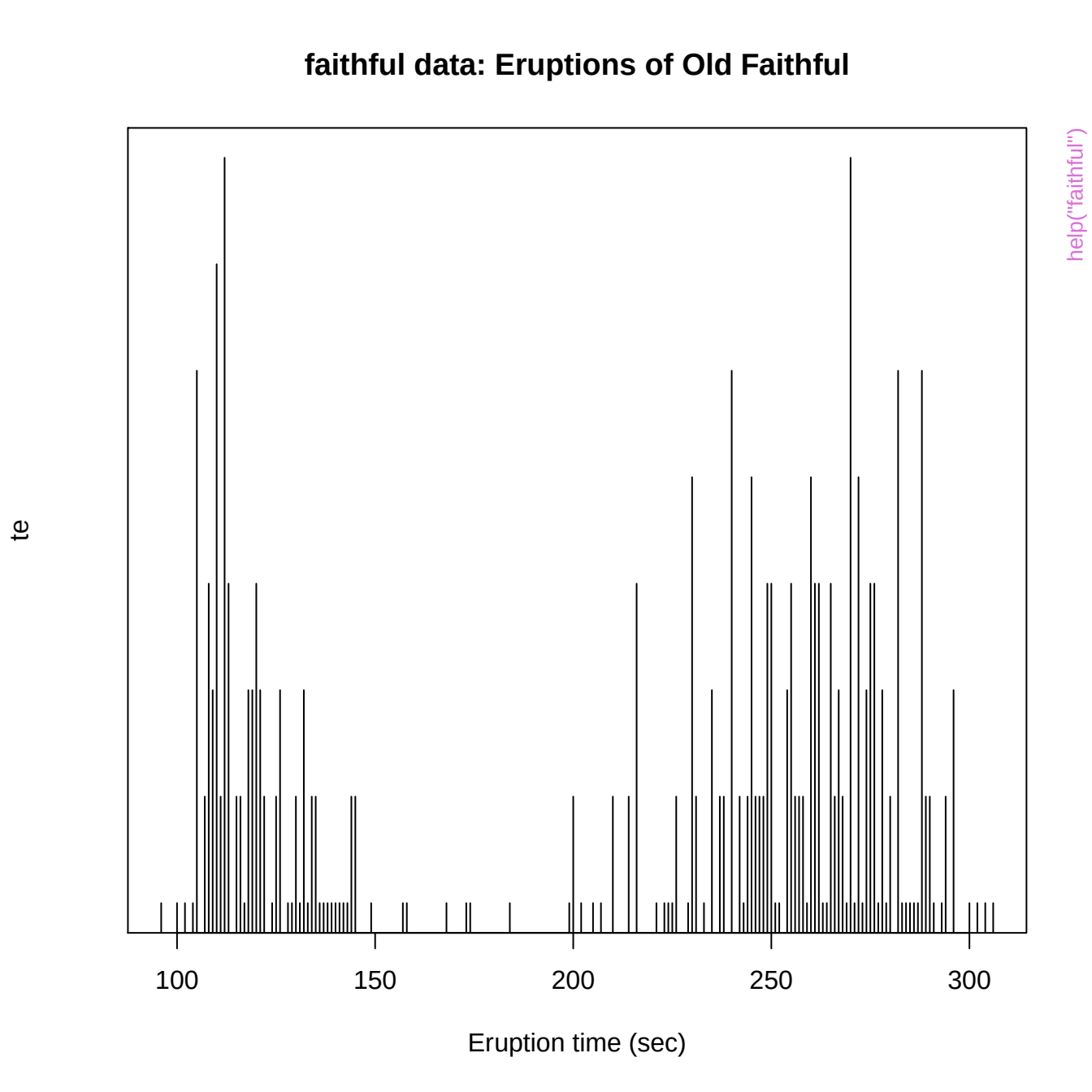


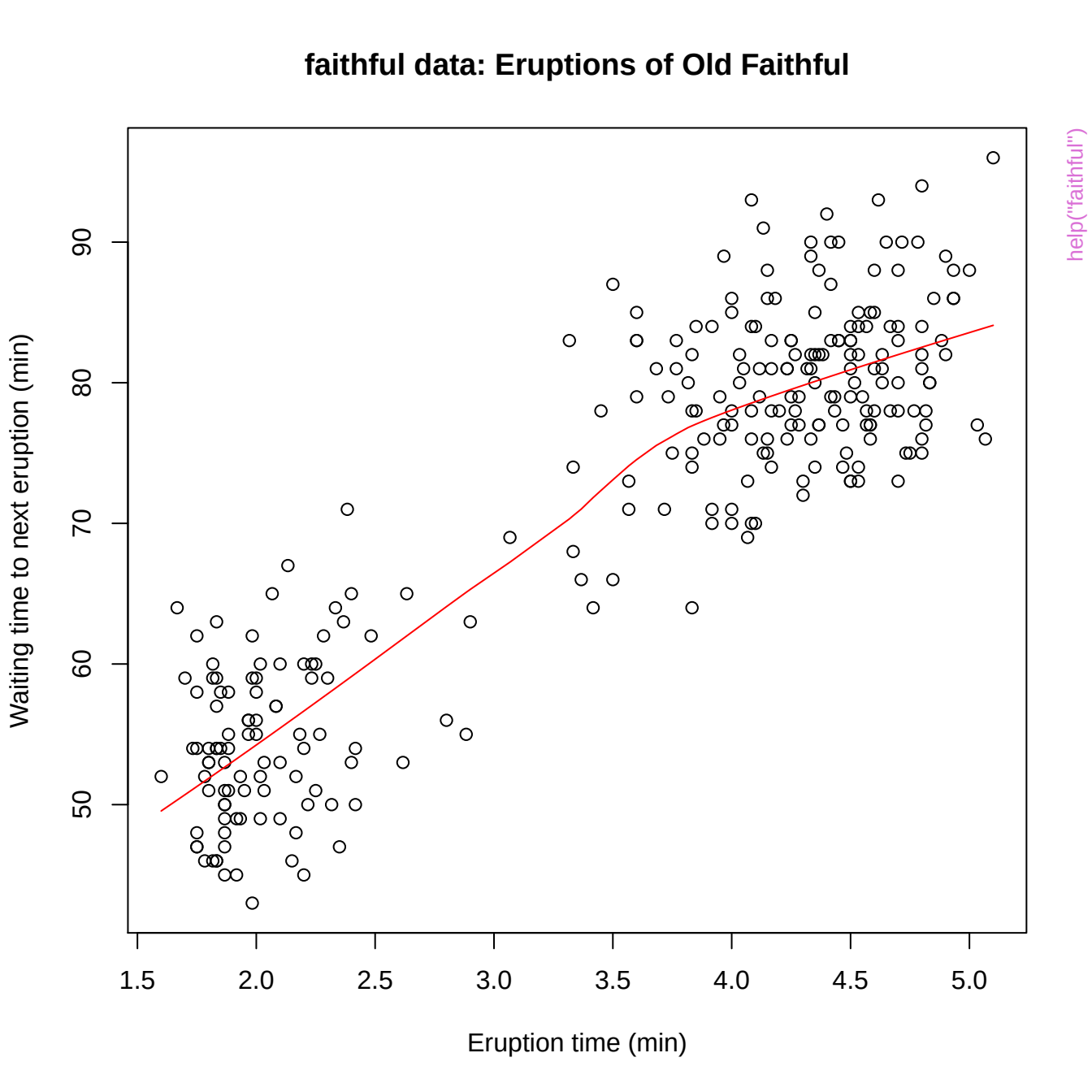
help("esoph")


euro data: 1 Euro in currency unit
PTE
NLG
LUF
ITL
IEP
FRF
FIM
ESP
DEM
BEF
ATS
0
500
1000
1500
2000
help("euro")

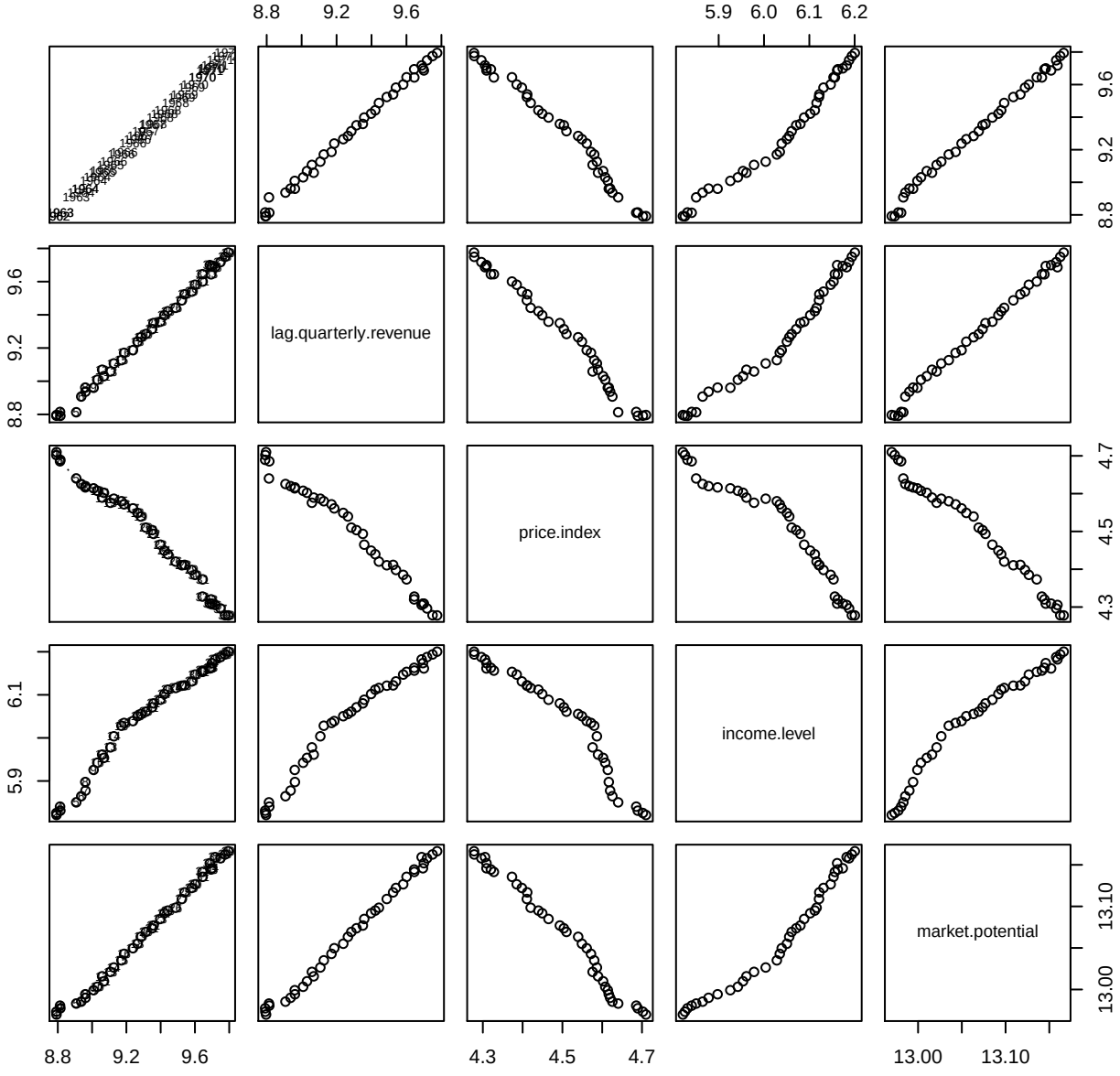

euro data: 1 currency unit in Euros
PTE
NLG
LUF
ITL
IEP
FRF
FIM
ESP
DEM
BEF
ATS
0.0
0.2
0.4
0.6
0.8
1.0
1.2
help("euro")


euro data: log10(1 Euro in currency unit)
PTE
NLG
LUF
ITL
IEP
FRF
FIM
ESP
DEM
BEF
ATS
0.0
0.5
1.0
1.5
2.0
2.5
3.0
help("euro")

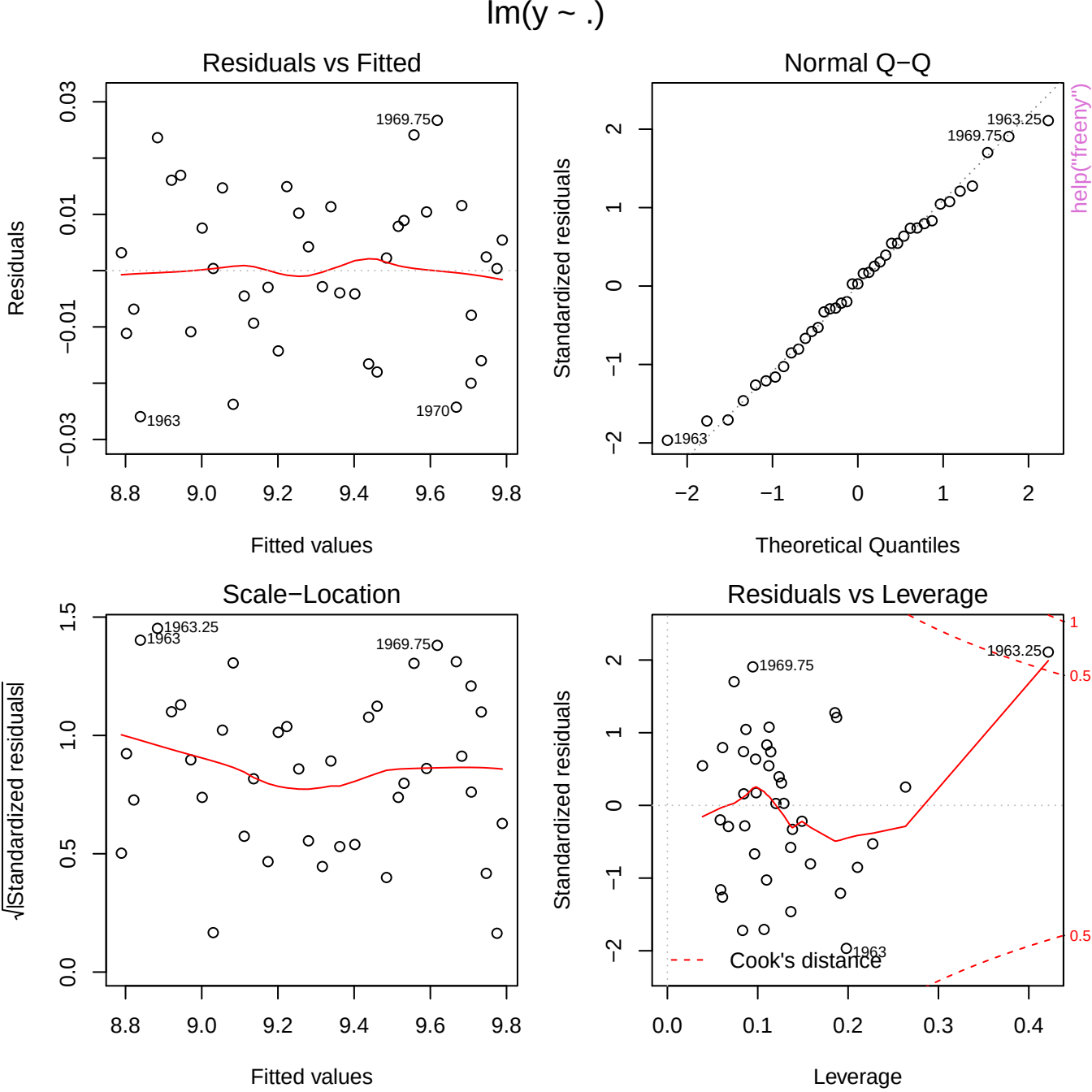

faithful data: Eruptions of Old Faithful
te
100
150
200
250
300
Eruption time (sec)
help("faithful")

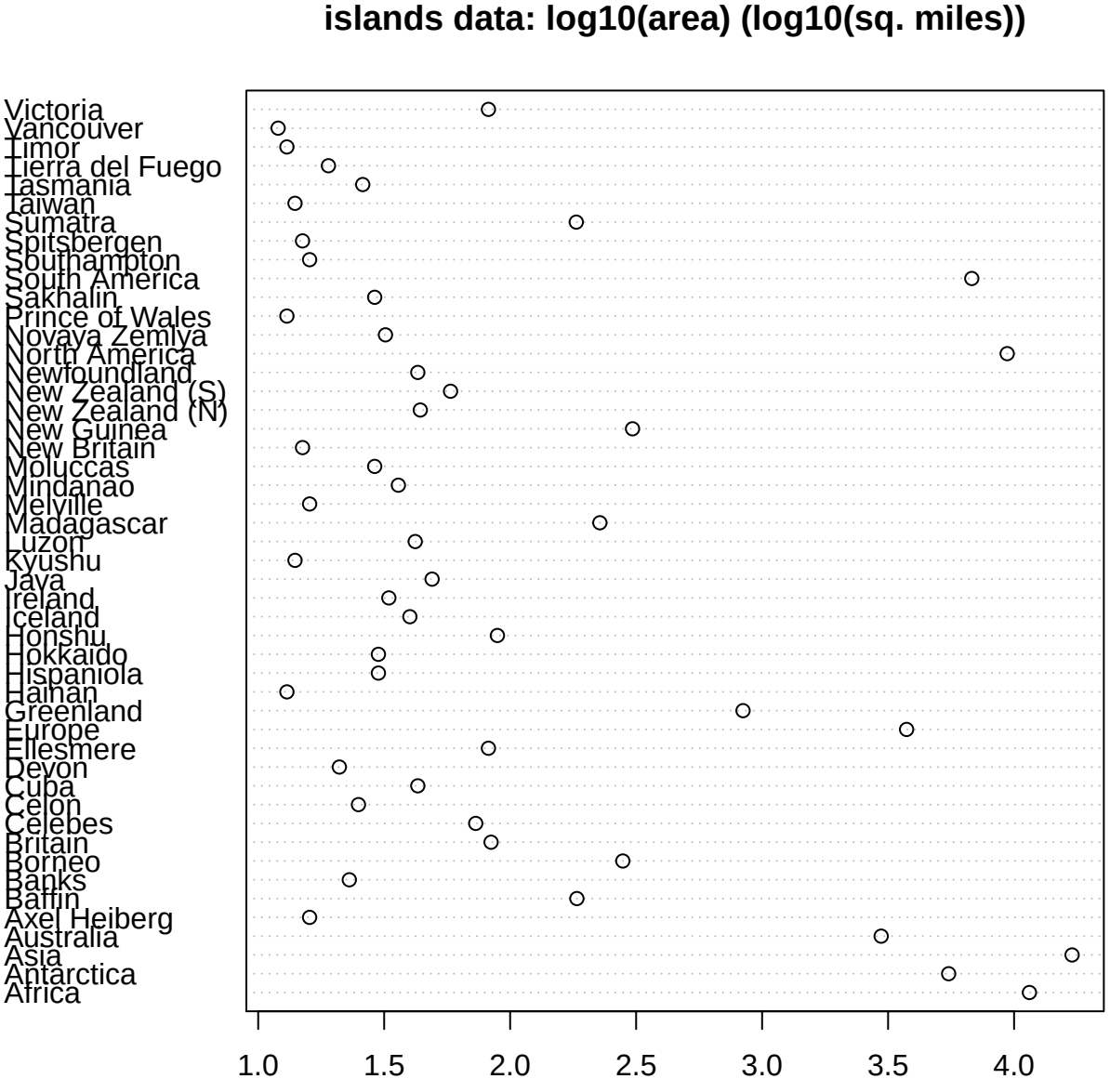

faithful data: Eruptions of Old Faithful
Waiting time to next eruption (min)
50
60
70
80
90
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Eruption time (min)
help("faithful")

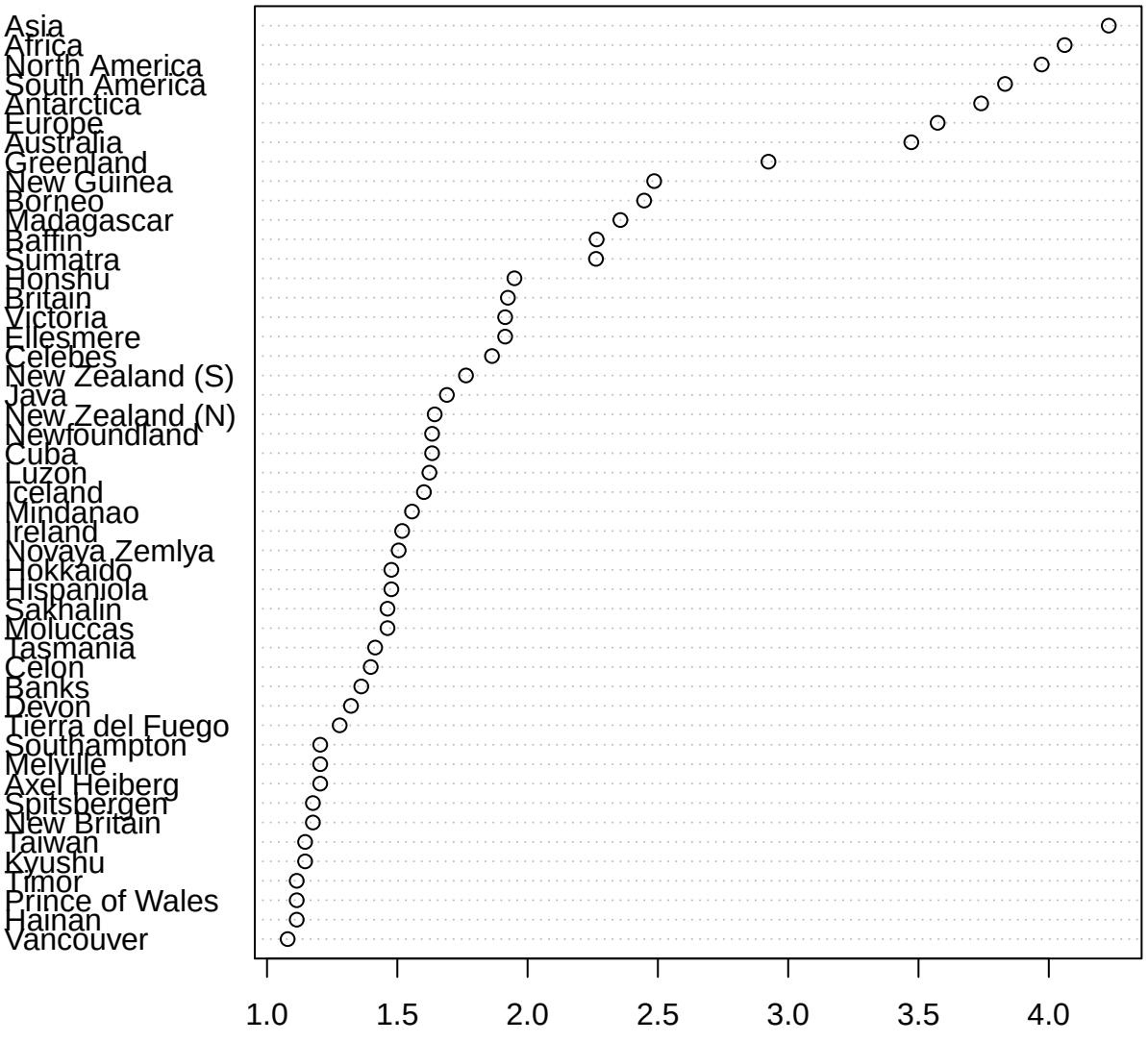
freeny data



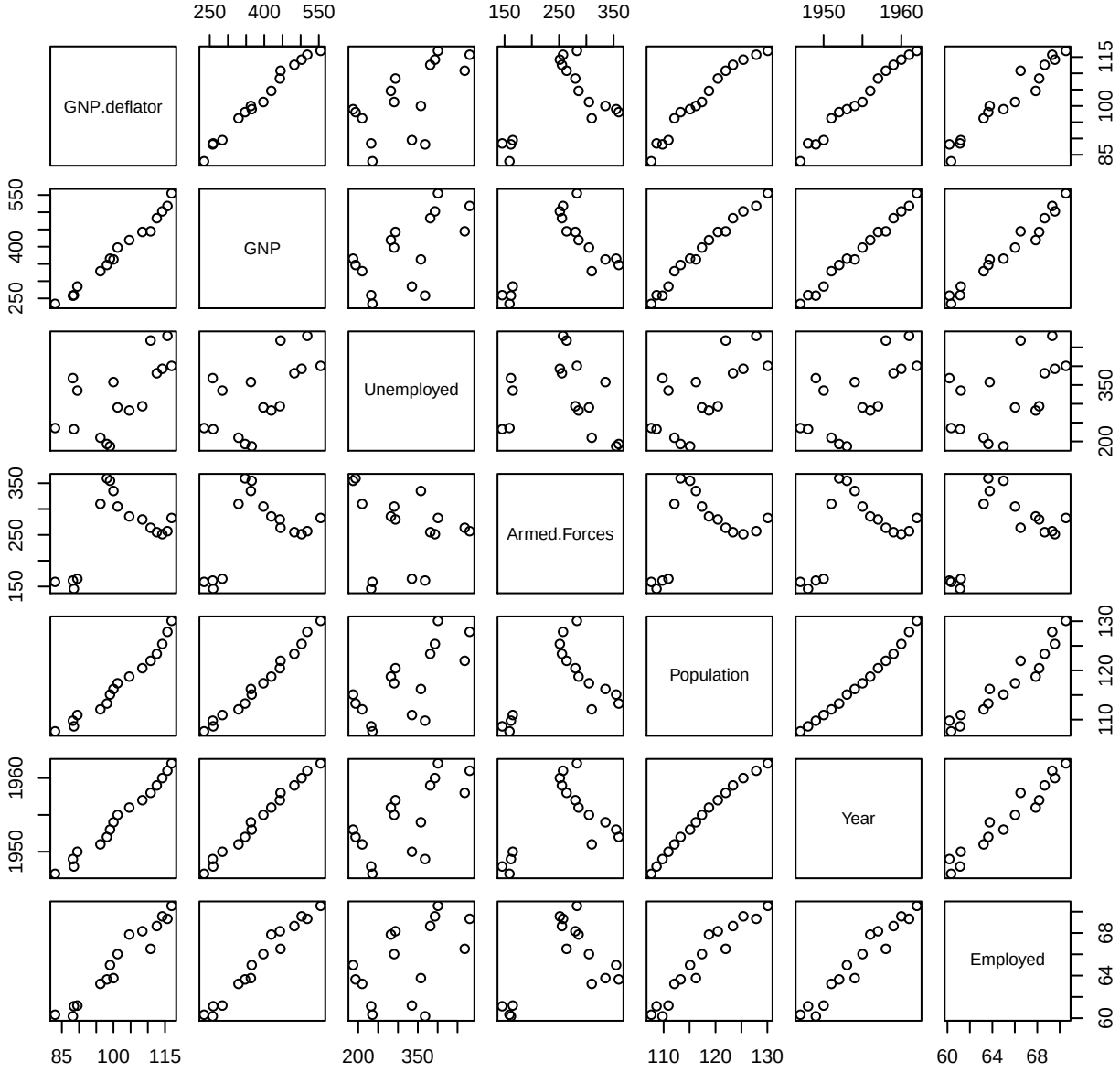
help("freeny")


lm(y ~ .)
Residuals vs Fitted
Residuals
Fitted values
1969.75
1963
1970
Normal Q−Q
Standardized residuals
Theoretical Quantiles
1963.25
1969.75
1963
help("freeny")
Scale−Location
√|Standardized residuals|
Fitted values
1963.25
1963
1969.75
Residuals vs Leverage
Standardized residuals
Leverage
1969.75
1963.25
1963
Cook's distance

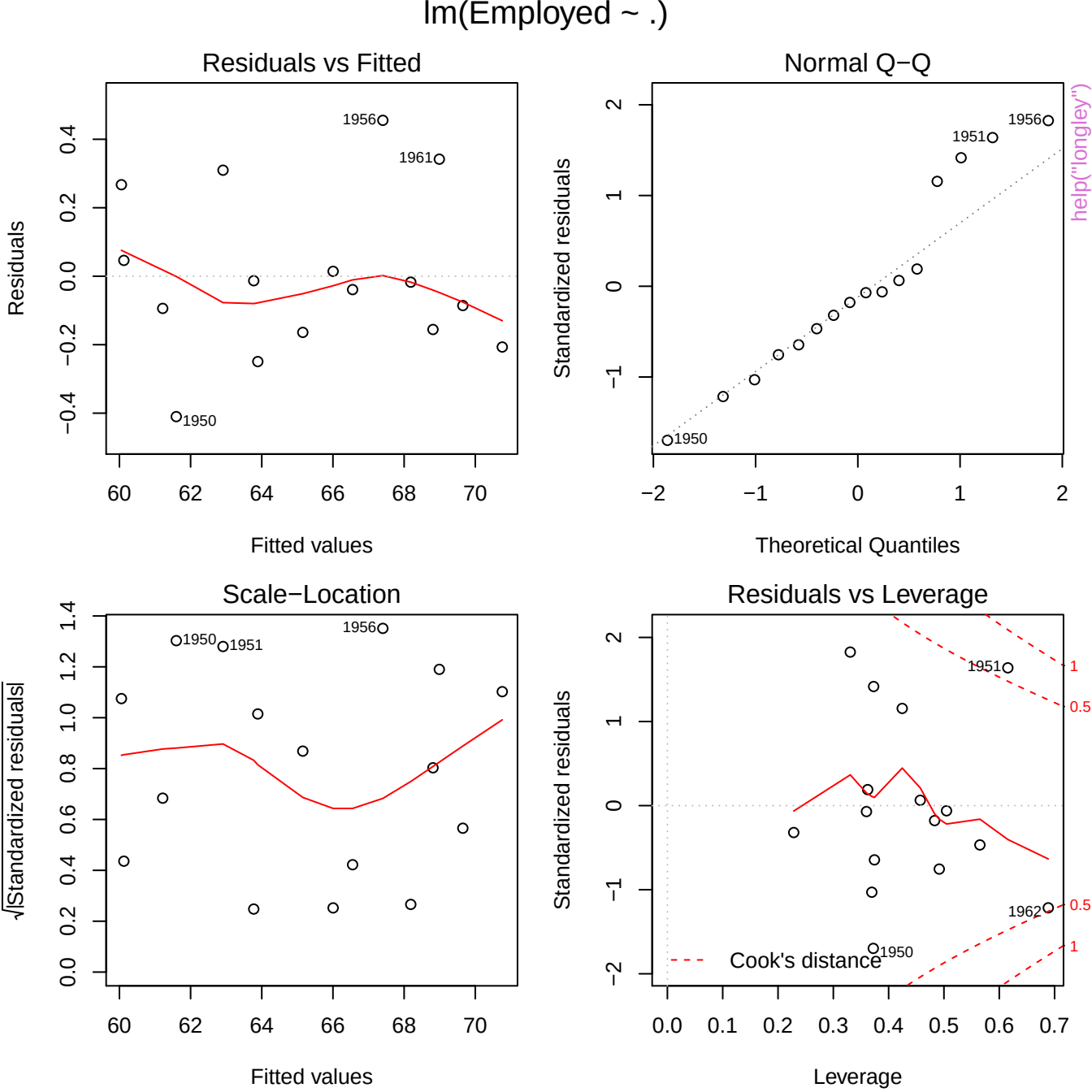

islands data: log10(area) (log10(sq. miles))
Victoria
Vancouver
Timor
Tierra del Fuego
Tasmania
Taiwan
Sumatra
Spitsbergen
Southampton
South America
Sakhalin
Prince of Wales
Novaya Zemlya
North America
Newfoundland
New Zealand (S)
New Zealand (N)
New Guinea
New Britain
Moluccas
Mindanao
Melville
Madagascar
Luzon
Kyushu
Java
Ireland
Iceland
Honshu
Hokkaido
Hispaniola
Hainan
Greenland
Europe
Ellesmere
Devon
Cuba
Ceylon
Celebes
Britain
Borneo
Banks
Baffin
Axel Heiberg
Australia
Asia
Antarctica
Africa
1.0
1.5
2.0
2.5
3.0
3.5
4.0
help("islands")

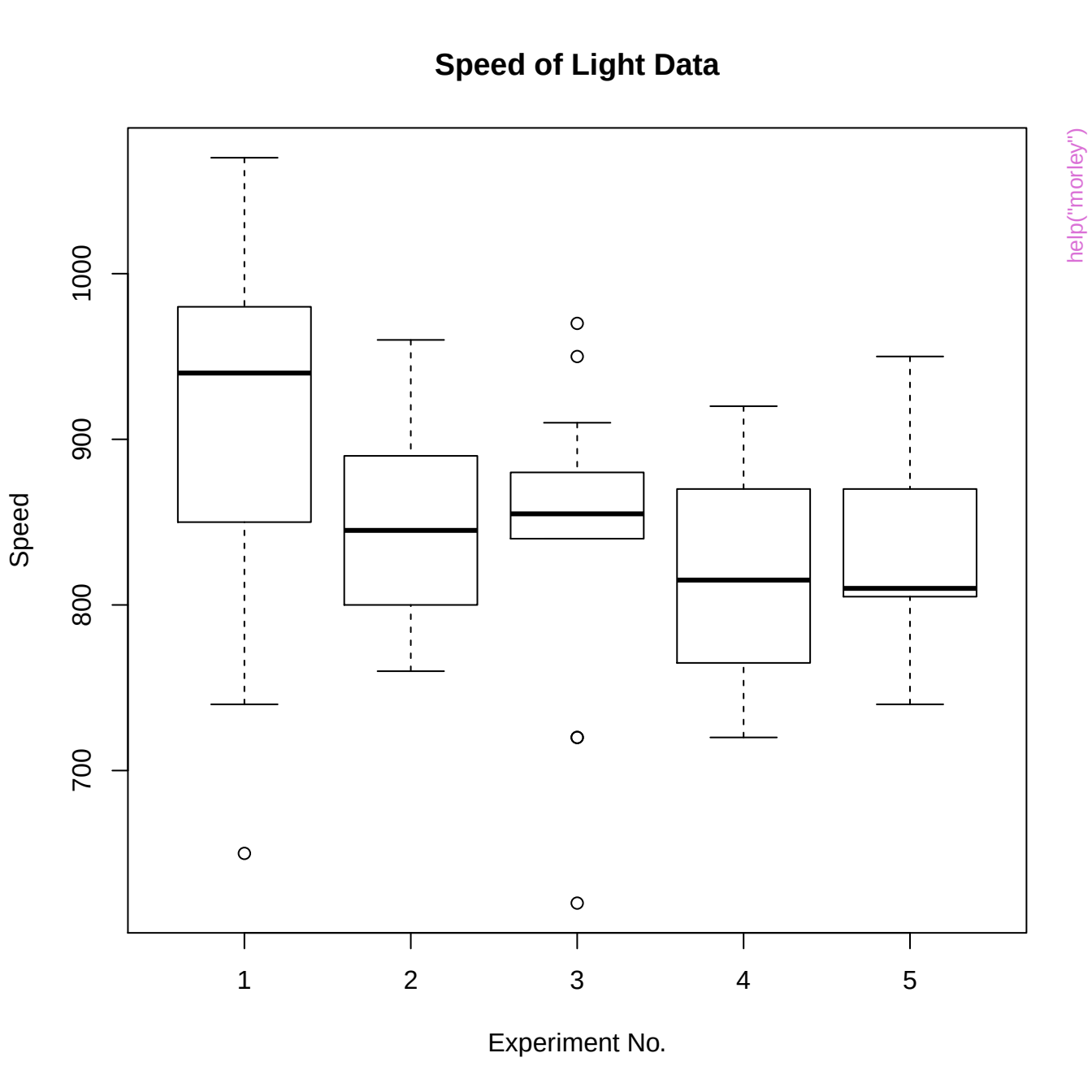

islands data: log10(area) (log10(sq. miles))
Asia
Africa
North America
South America
Antarctica
Europe
Australia
Greenland
New Guinea
Borneo
Madagascar
Baffin
Sumatra
Honshu
Britain
Victoria
Ellesmere
Celebes
New Zealand (S)
Java
New Zealand (N)
Newfoundland
Cuba
Luzon
Iceland
Mindanao
Ireland
Novaya Zemlya
Hokkaido
Hispaniola
Sakhalin
Moluccas
Tasmania
Ceylon
Banks
Devon
Tierra del Fuego
Southampton
Melville
Axel Heiberg
Spitsbergen
New Britain
Taiwan
Kyushu
Timor
Prince of Wales
Hainan
Vancouver
1.0
1.5
2.0
2.5
3.0
3.5
4.0
help("islands")

longley data

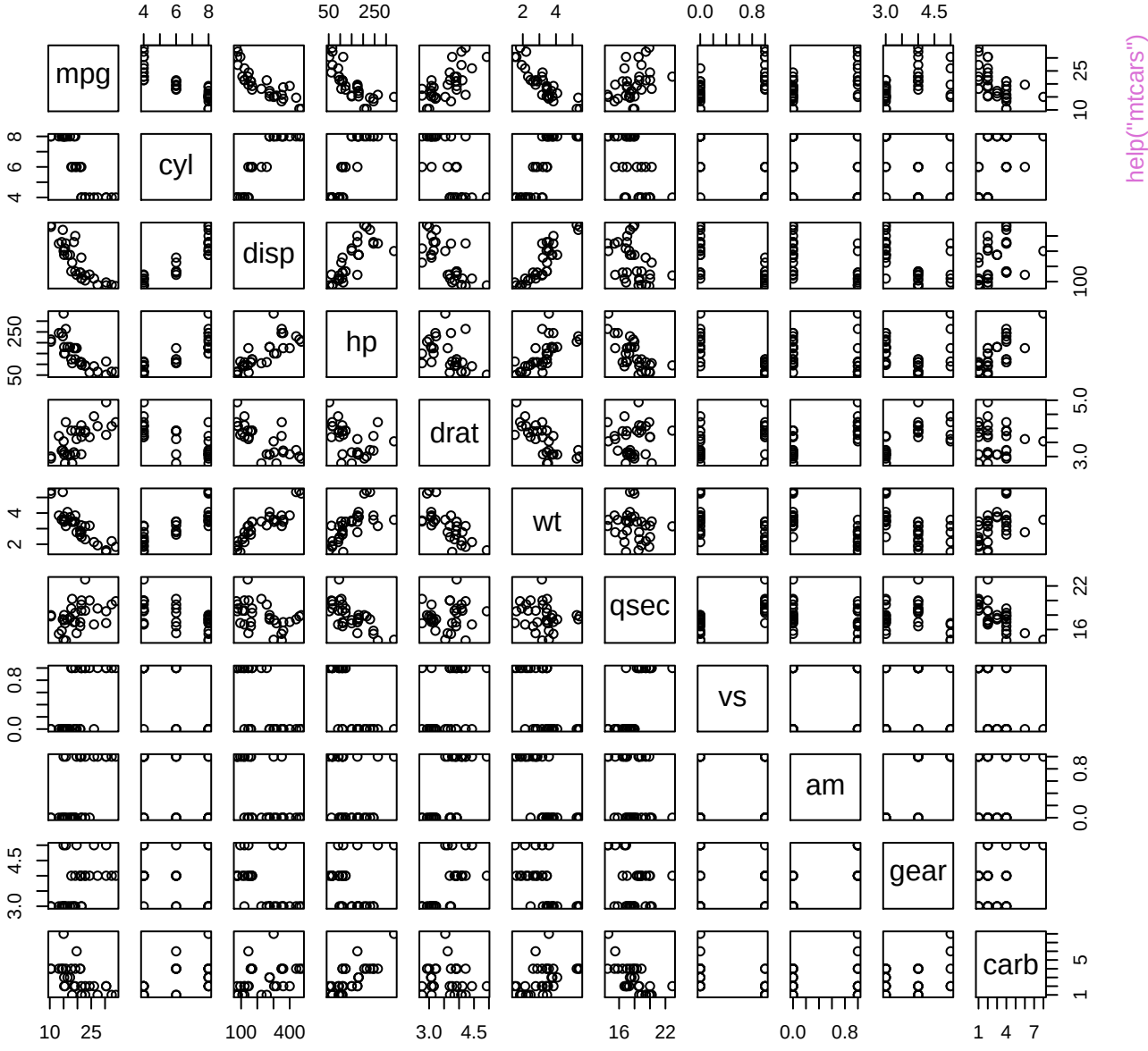


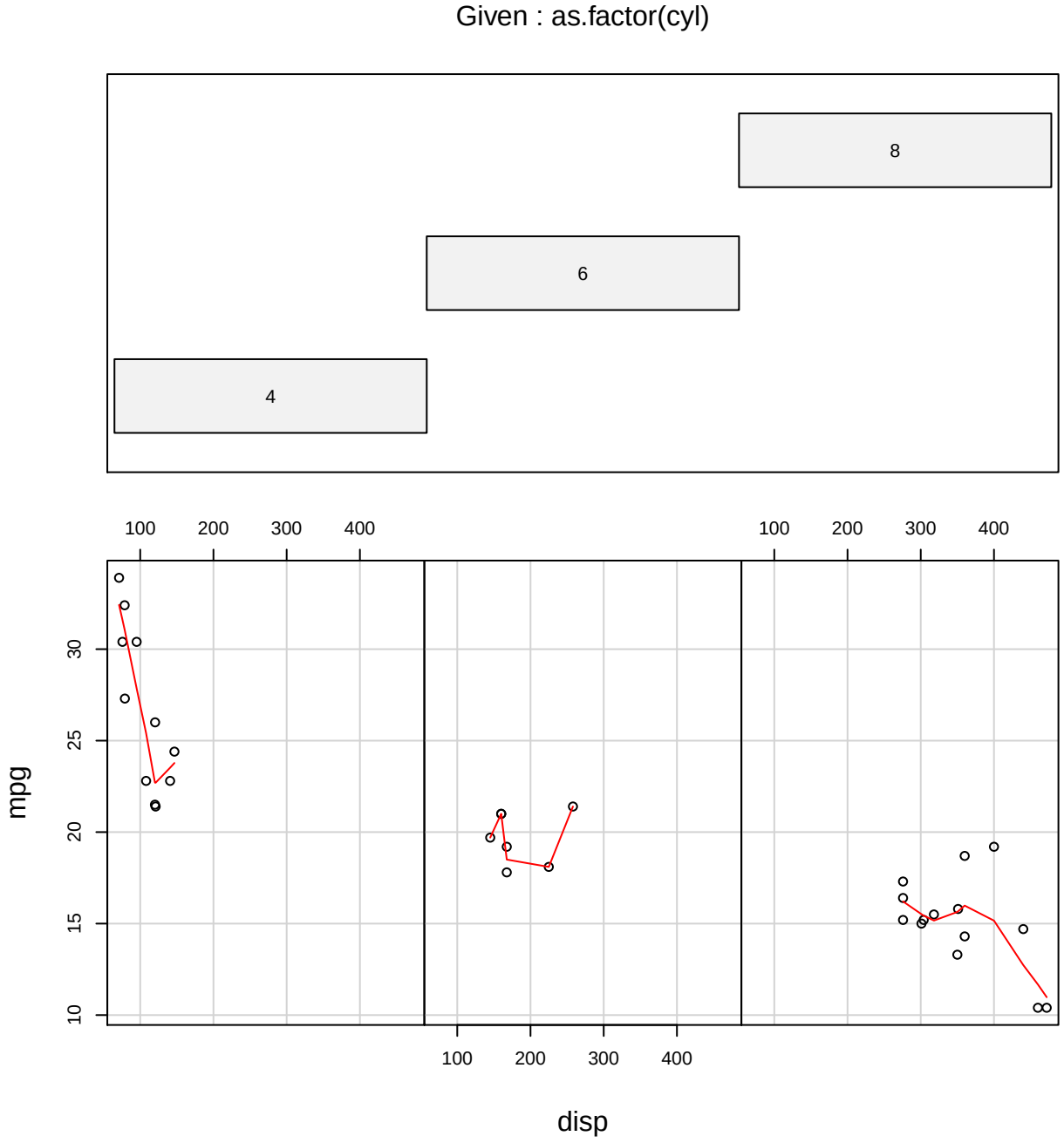
help("longley")


lm(Employed ~ .)
Residuals vs Fitted
Residuals
Fitted values
1956
1961
1950
Normal Q−Q
Standardized residuals
Theoretical Quantiles
1956
1951
1950
help("longley")
Scale−Location
√|Standardized residuals|
Fitted values
1950
1951
1956
Residuals vs Leverage
Standardized residuals
Leverage
1951
1962
1950
Cook's distance
1
0.5
0.5
1

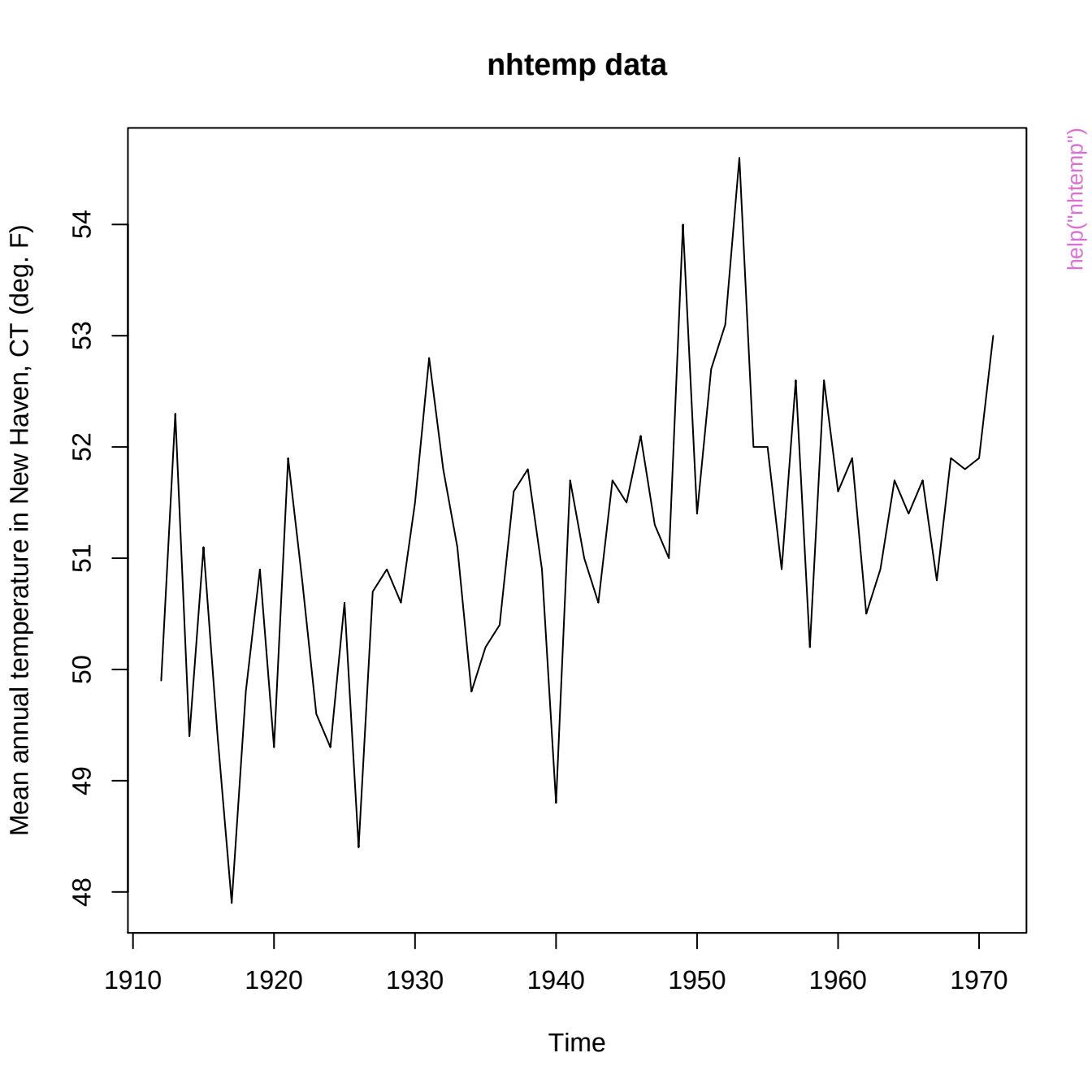

Speed of Light Data
help("morley")
Speed
700
800
900
1000
1
2
3
4
5
Experiment No.

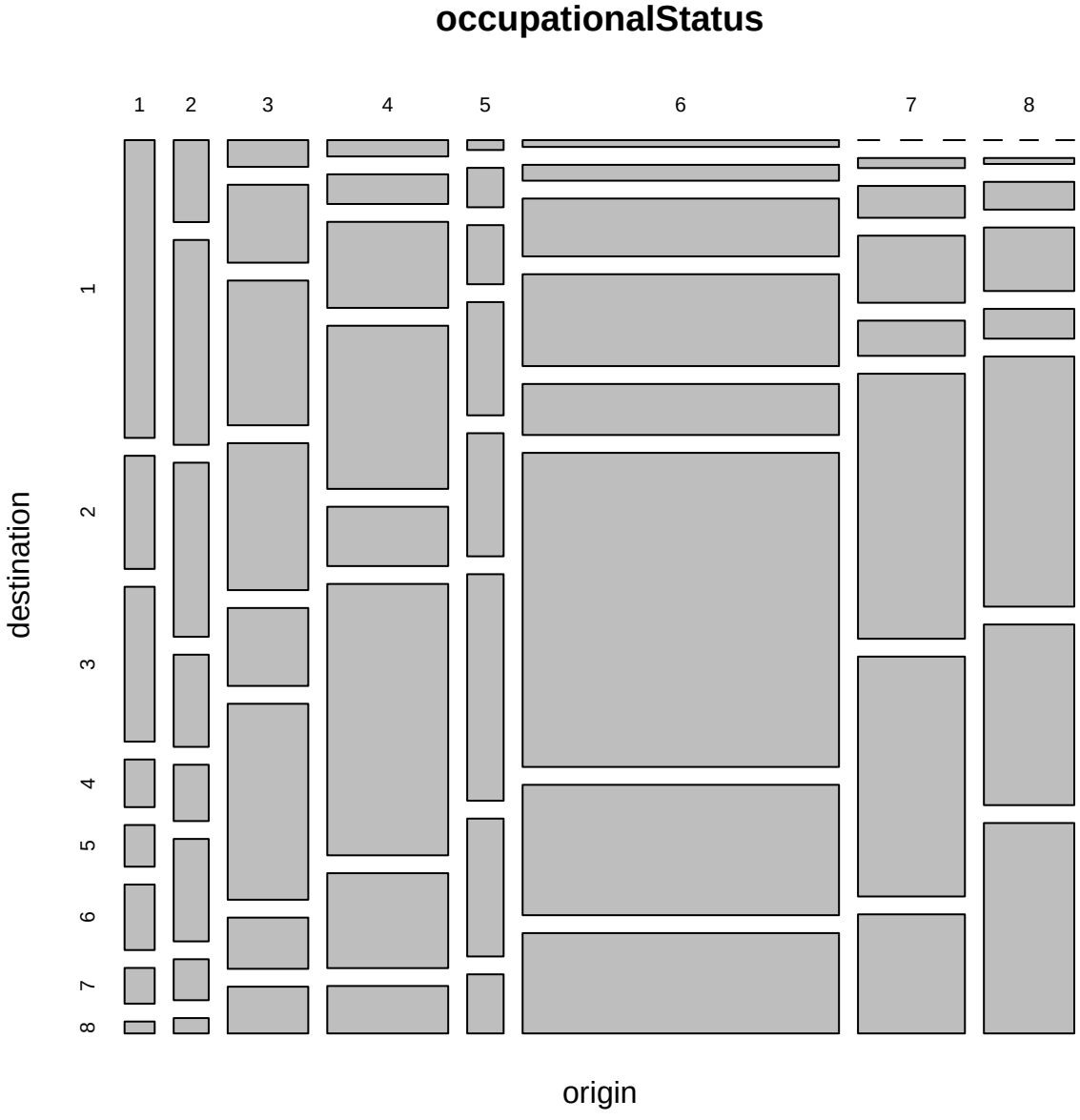
mtcars data

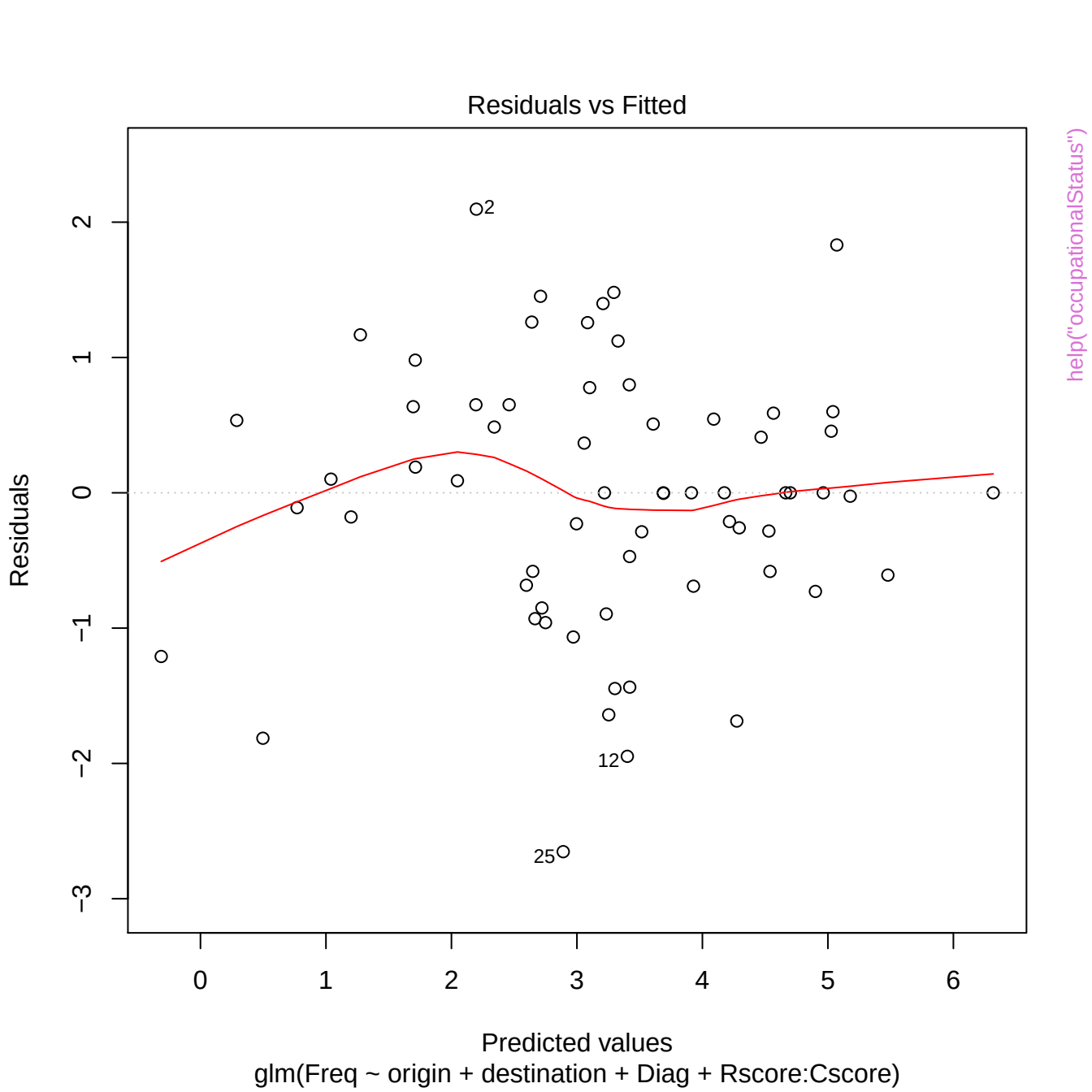


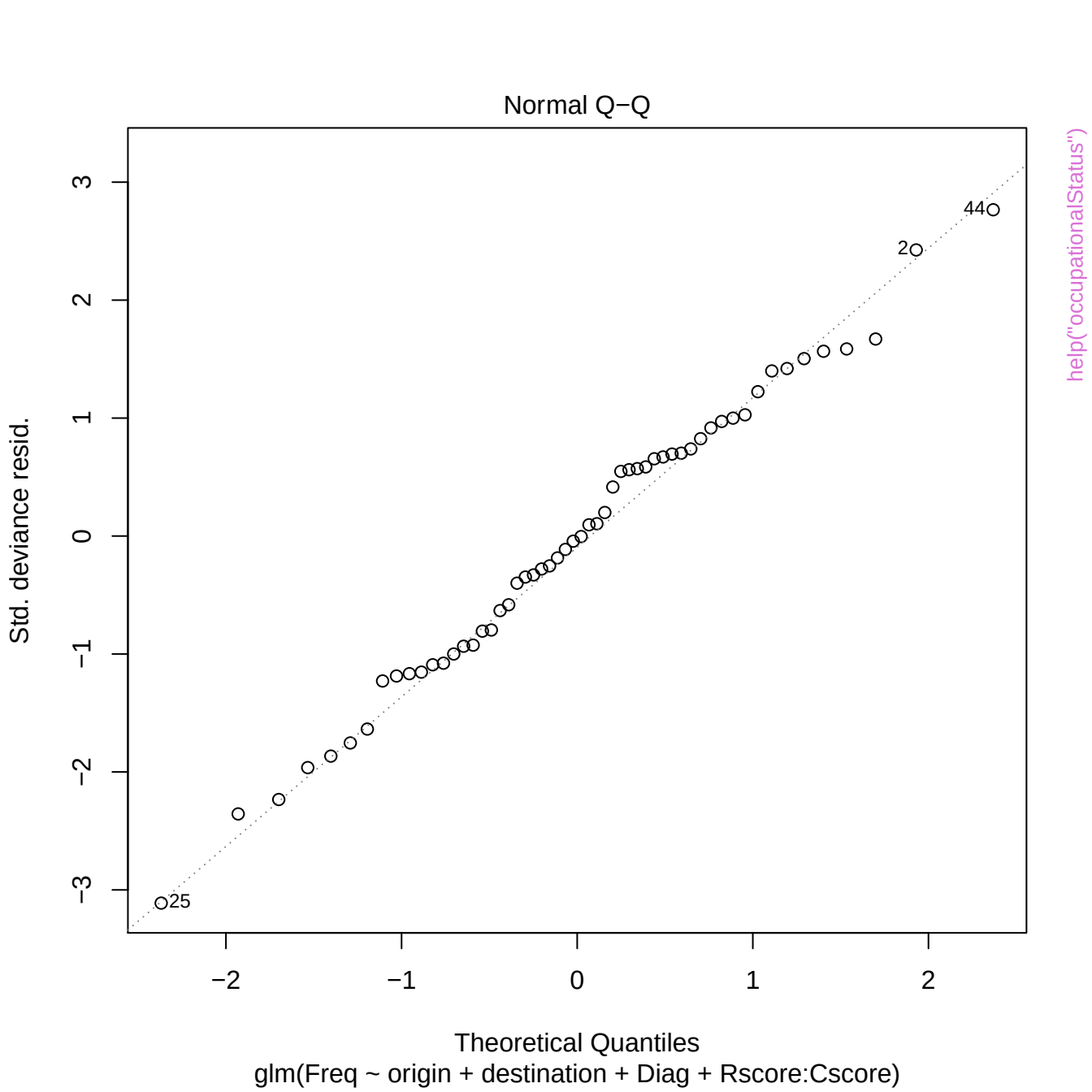


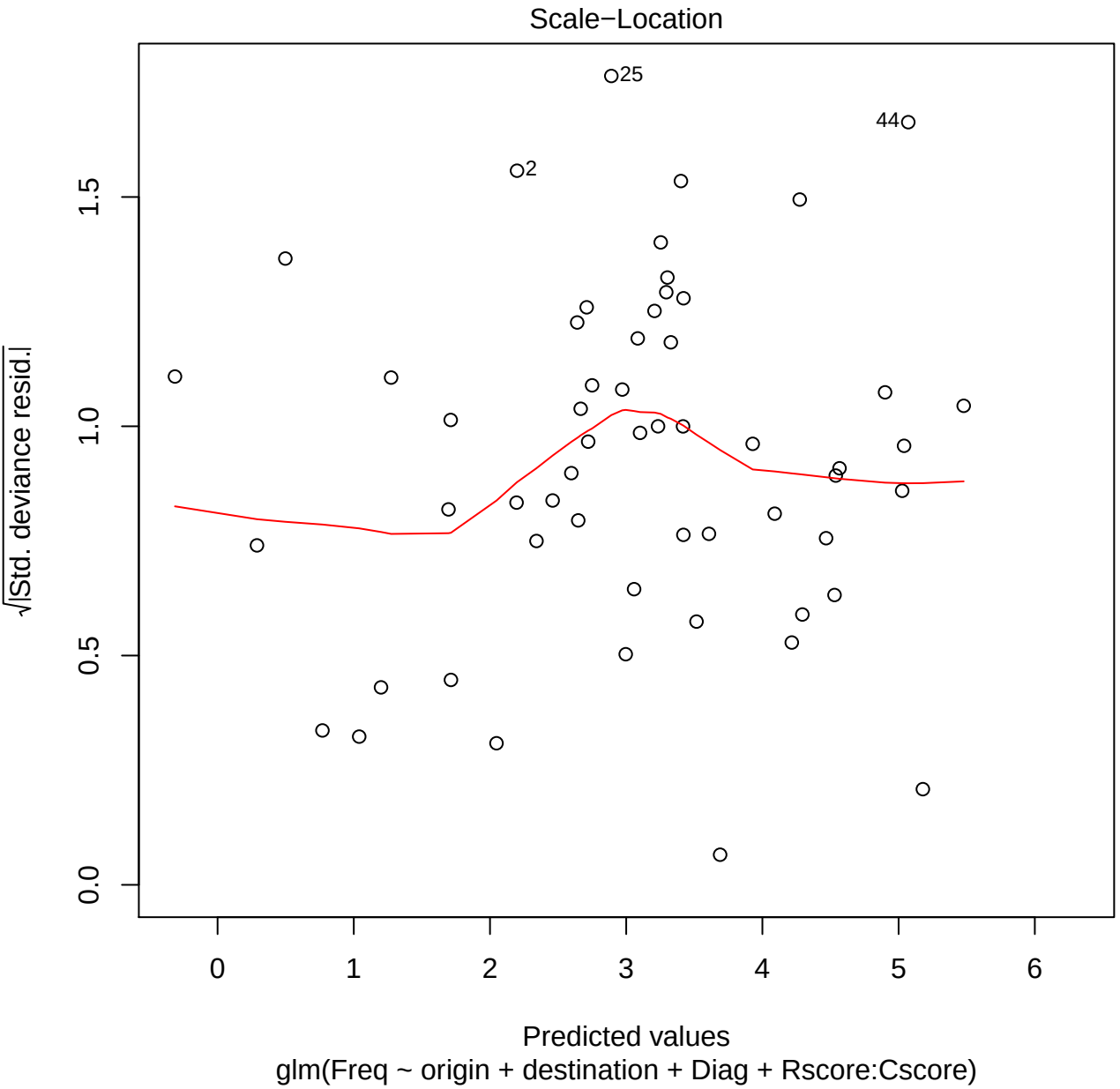
help("mtcars")

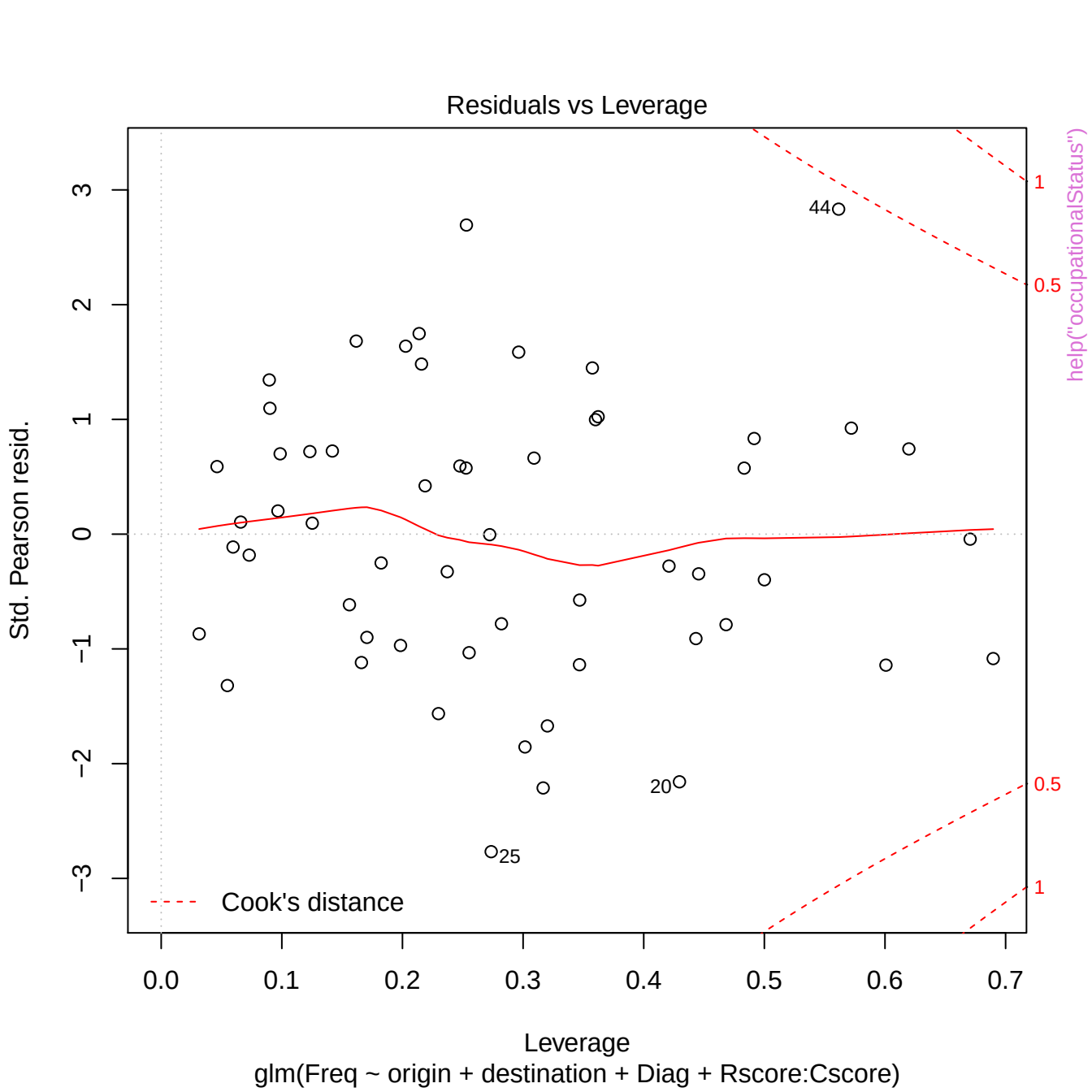

nhtemp data
Mean annual temperature in New Haven, CT (deg. F)
48
49
50
51
52
53
54
1910
1920
1930
1940
1950
1960
1970
Time
help("nhtemp")

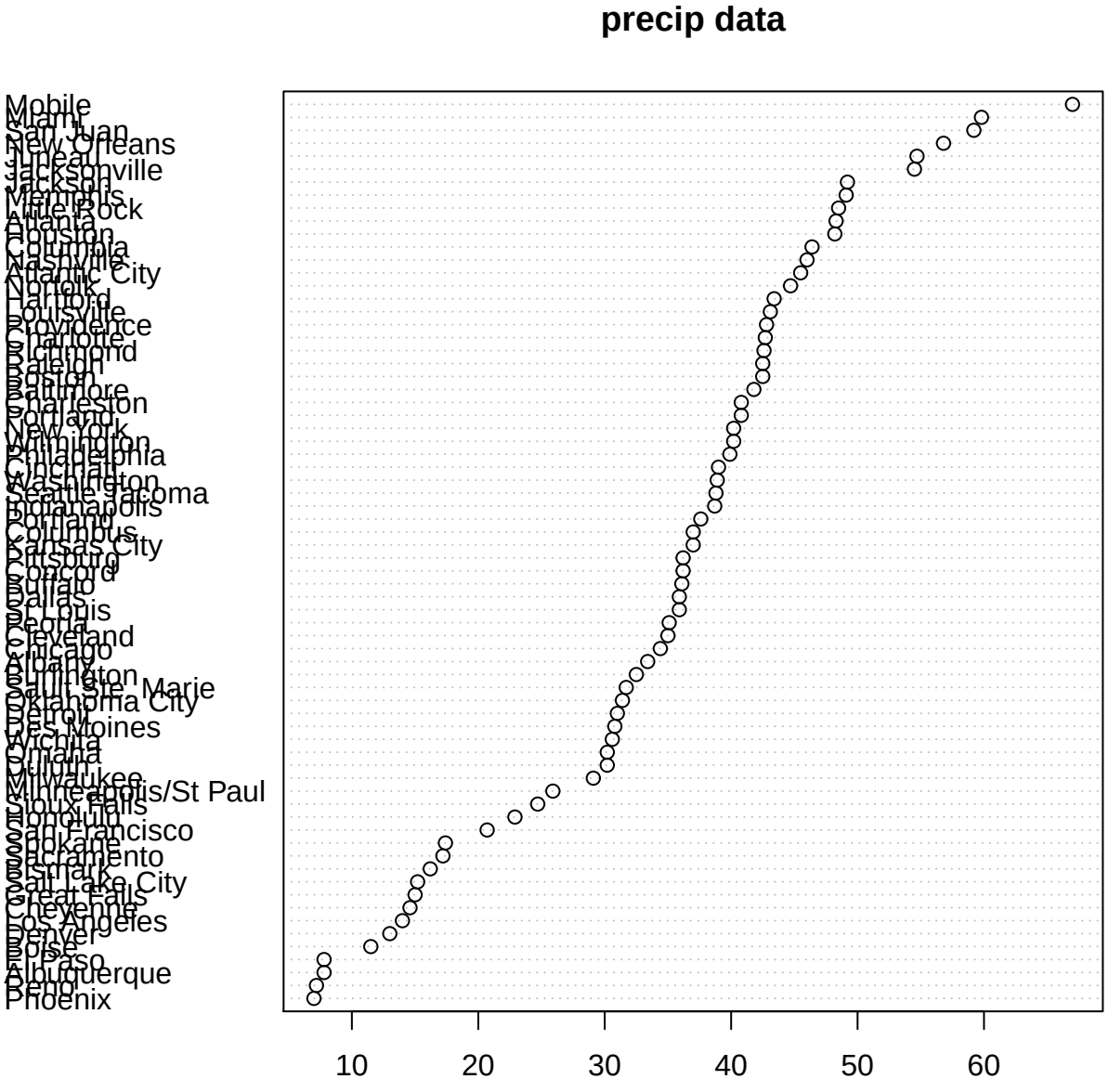

occupationalStatus
1
2
3
4
5
6
7
8
destination
origin
help("occupationalStatus")

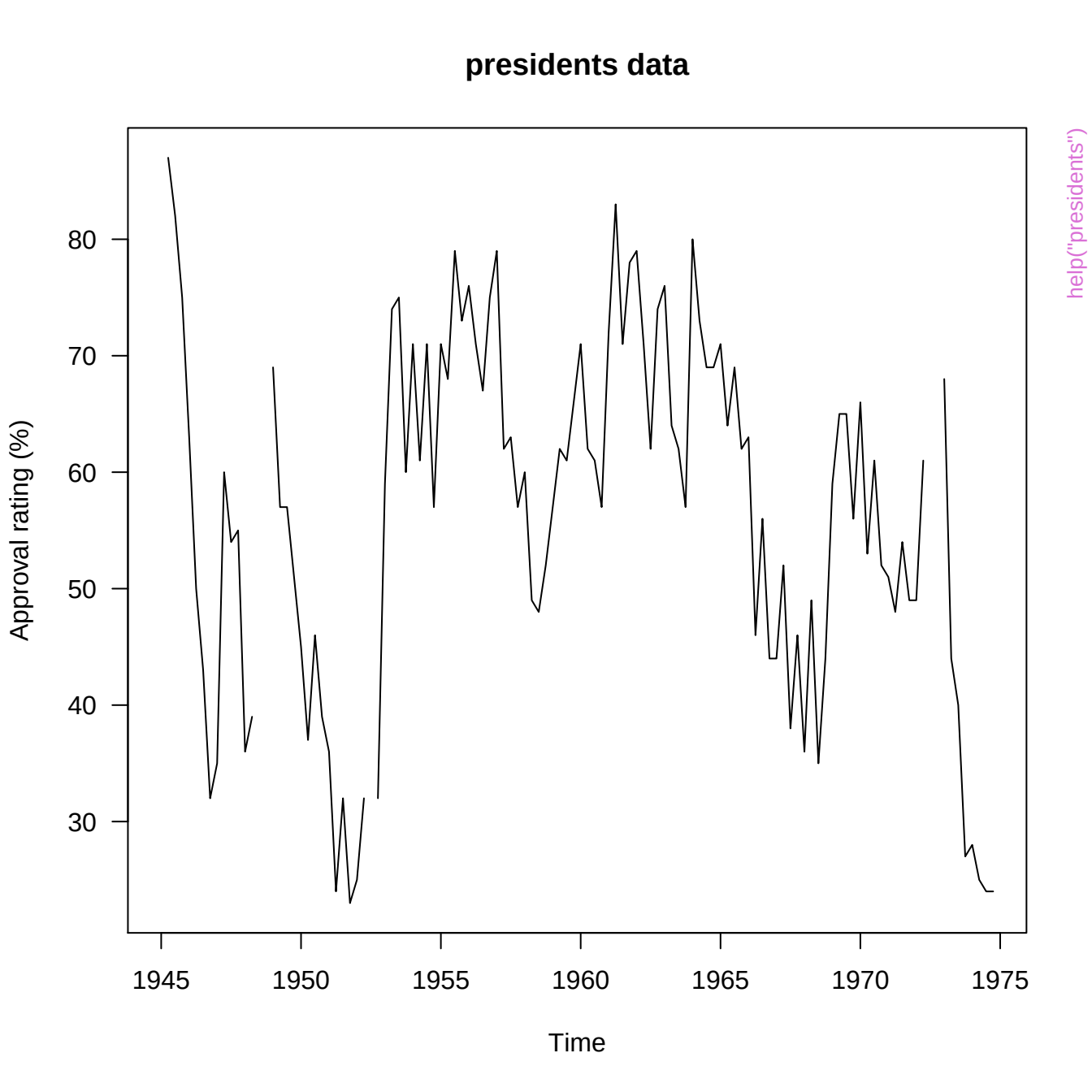

Residuals vs Fitted
Residuals
Predicted values
glm(Freq ~ origin + destination + Diag + Rscore:Cscore)
help("occupationalStatus")
2
12
25
−3
−2
−1
0
1
2
0
1
2
3
4
5
6

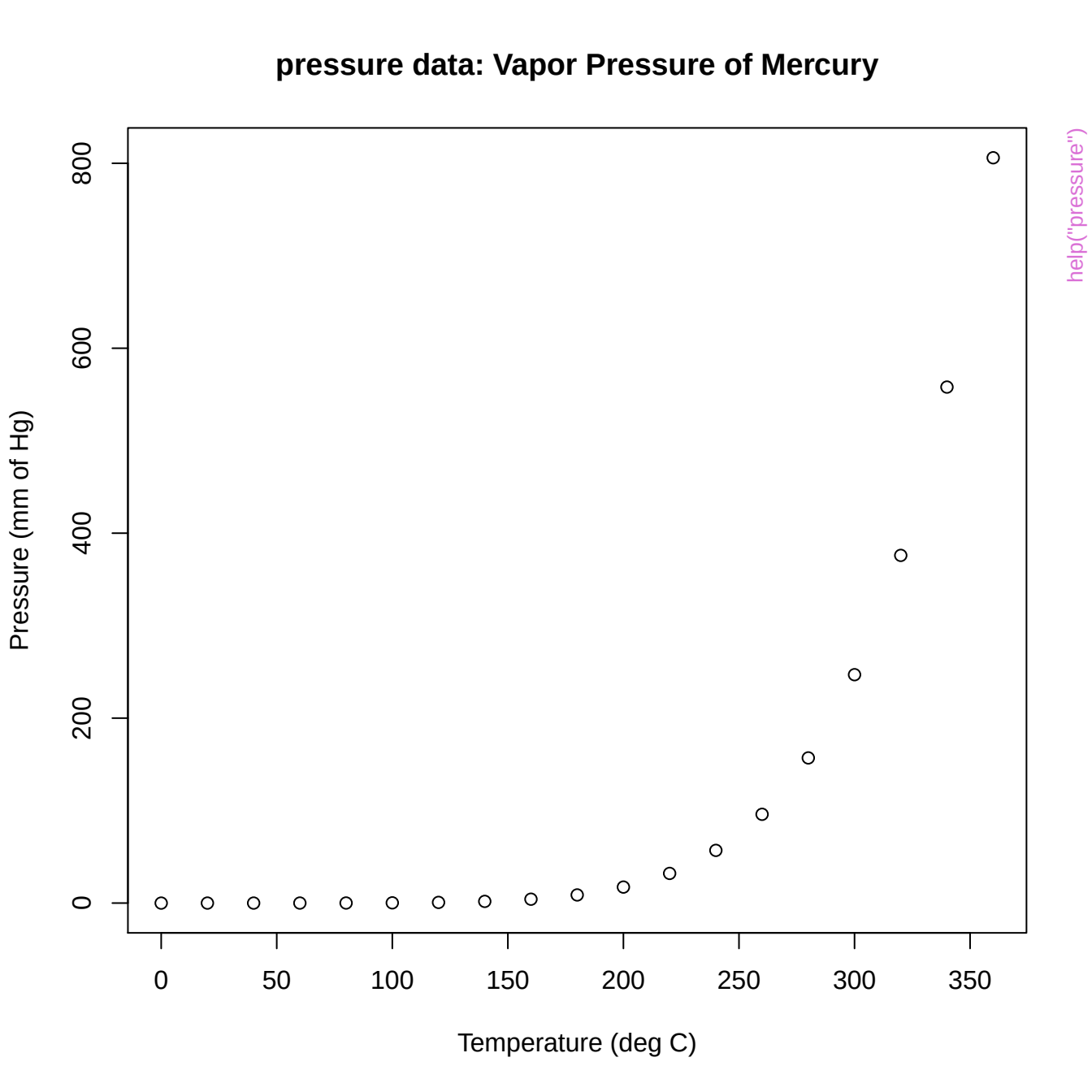

Normal Q−Q
Std. deviance resid.
Theoretical Quantiles
glm(Freq ~ origin + destination + Diag + Rscore:Cscore)
help("occupationalStatus")
25
2
44
−3
−2
−1
0
1
2
3

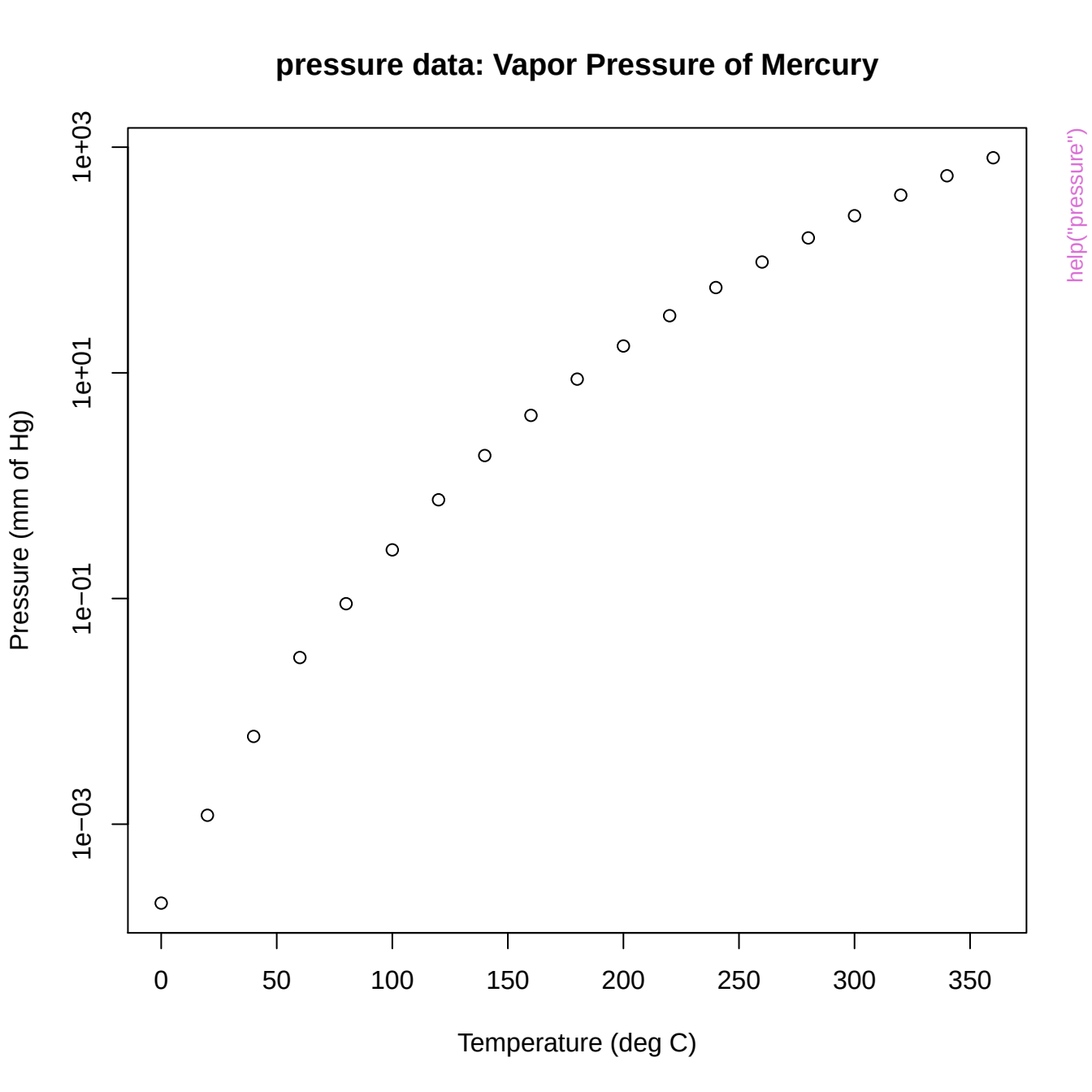

Scale−Location
25
44
2
√|Std. deviance resid.|
0.0
0.5
1.0
1.5
0
1
2
3
4
5
6
Predicted values
glm(Freq ~ origin + destination + Diag + Rscore:Cscore)
help("occupationalStatus")


Residuals vs Leverage
Std. Pearson resid.
Leverage
glm(Freq ~ origin + destination + Diag + Rscore:Cscore)
Cook's distance
help("occupationalStatus")
44
20
25
1
0.5
0.5
1
3
2
1
0
−1
−2
−3
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7

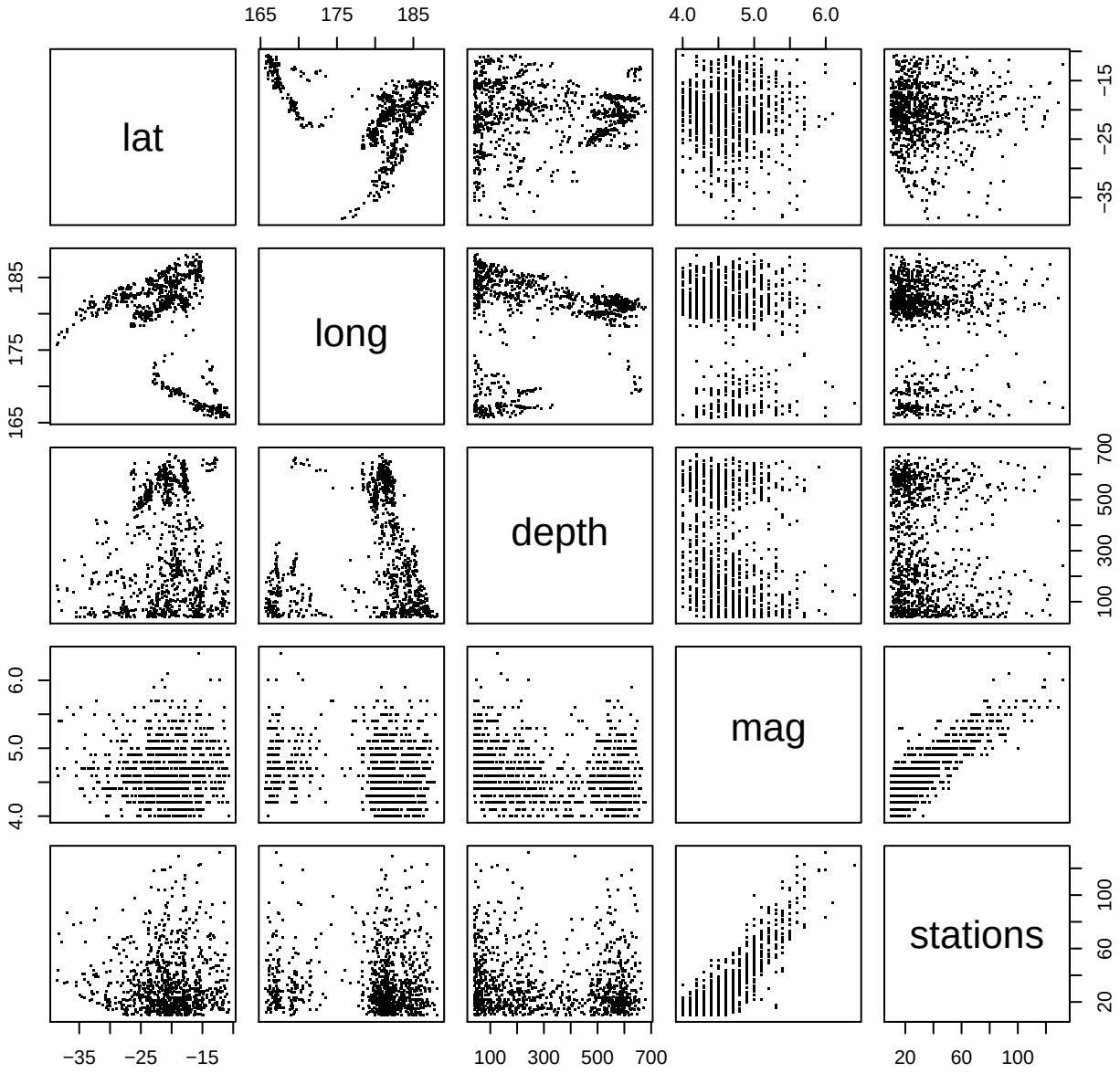

precip data
Mobile
Miami
San Juan
New Orleans
Juneau
Jacksonville
Jackson
Memphis
Little Rock
Atlanta
Houston
Columbia
Nashville
Atlantic City
Norfolk
Hartford
Louisville
Providence
Charlotte
Richmond
Raleigh
Boston
Baltimore
Charleston
Portland
New York
Wilmington
Philadelphia
Cincinnati
Washington
Seattle-Tacoma
Indianapolis
Portland
Columbus
Kansas City
Pittsburg
Concord
Buffalo
Dallas
St Louis
Peoria
Cleveland
Chicago
Albany
Burlington
Sault Ste Marie
Oklahoma City
Detroit
Des Moines
Wichita
Omaha
Duluth
Milwaukee
Minneapolis/St Paul
Sioux Falls
Honolulu
San Francisco
Spokane
Sacramento
Bismark
Salt Lake City
Great Falls
Cheyenne
Los Angeles
Denver
Boise
El Paso
Albuquerque
Reno
Phoenix
10
20
30
40
50
60
Average annual precipitation (in.)
help("precip")


presidents data
Approval rating (%)
80
70
60
50
40
30
1945
1950
1955
1960
1965
1970
1975
Time
help("presidents")

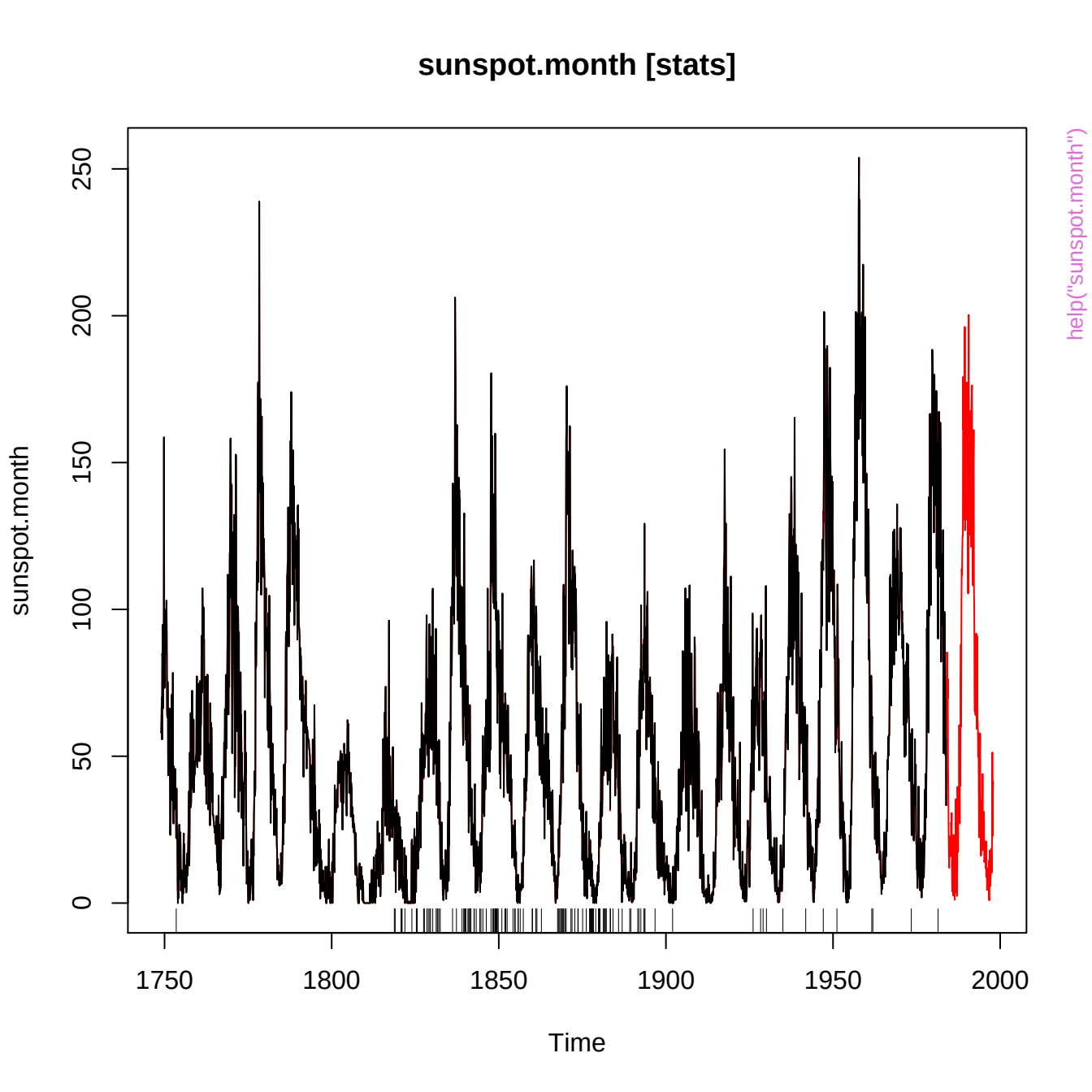

pressure data: Vapor Pressure of Mercury
Pressure (mm of Hg)
0
200
400
600
800
0
50
100
150
200
250
300
350
Temperature (deg C)
help("pressure")

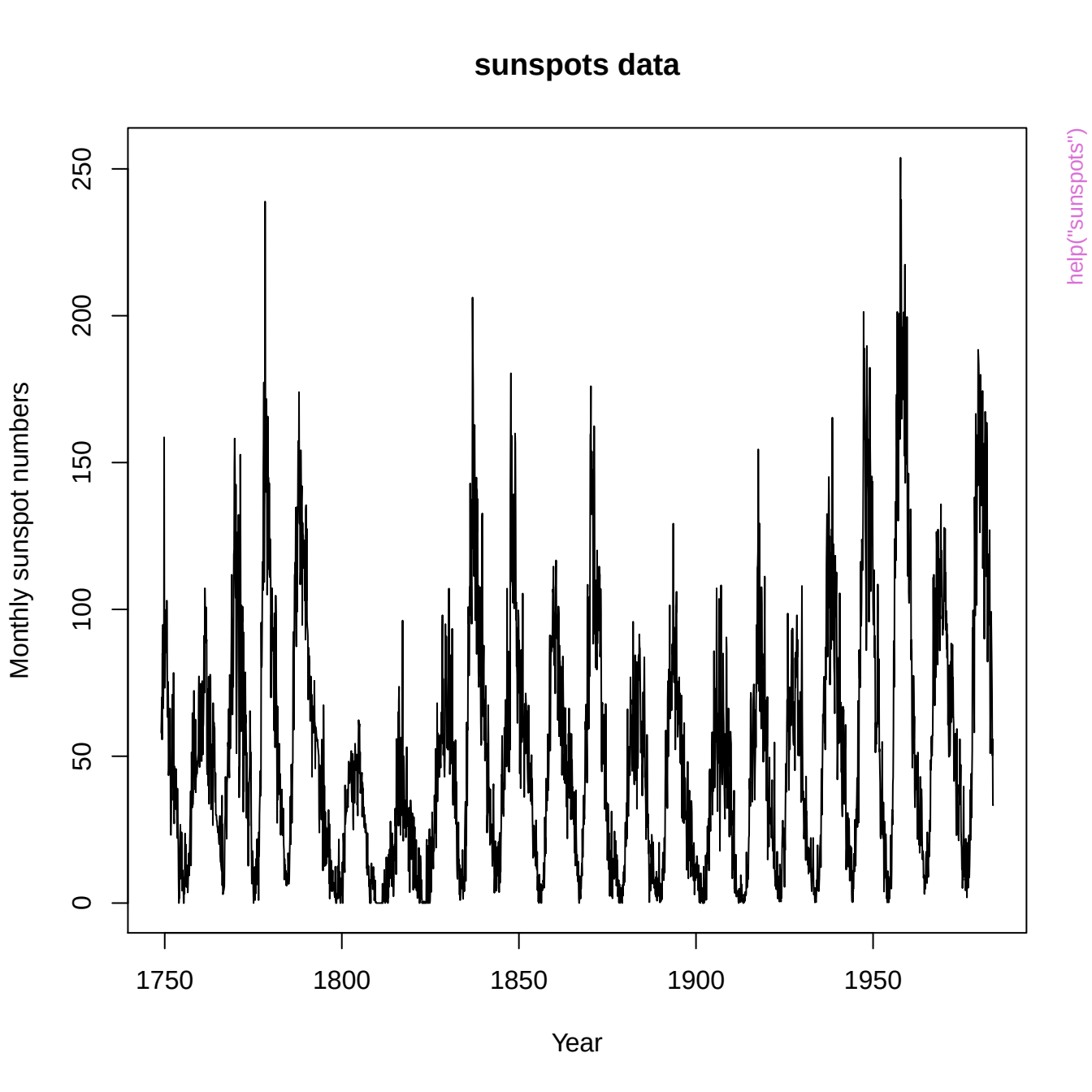

pressure data: Vapor Pressure of Mercury
Pressure (mm of Hg)
1e+03
1e+01
1e−01
1e−03
0
50
100
150
200
250
300
350
Temperature (deg C)
help("pressure")

Fiji Earthquakes, N = 1000

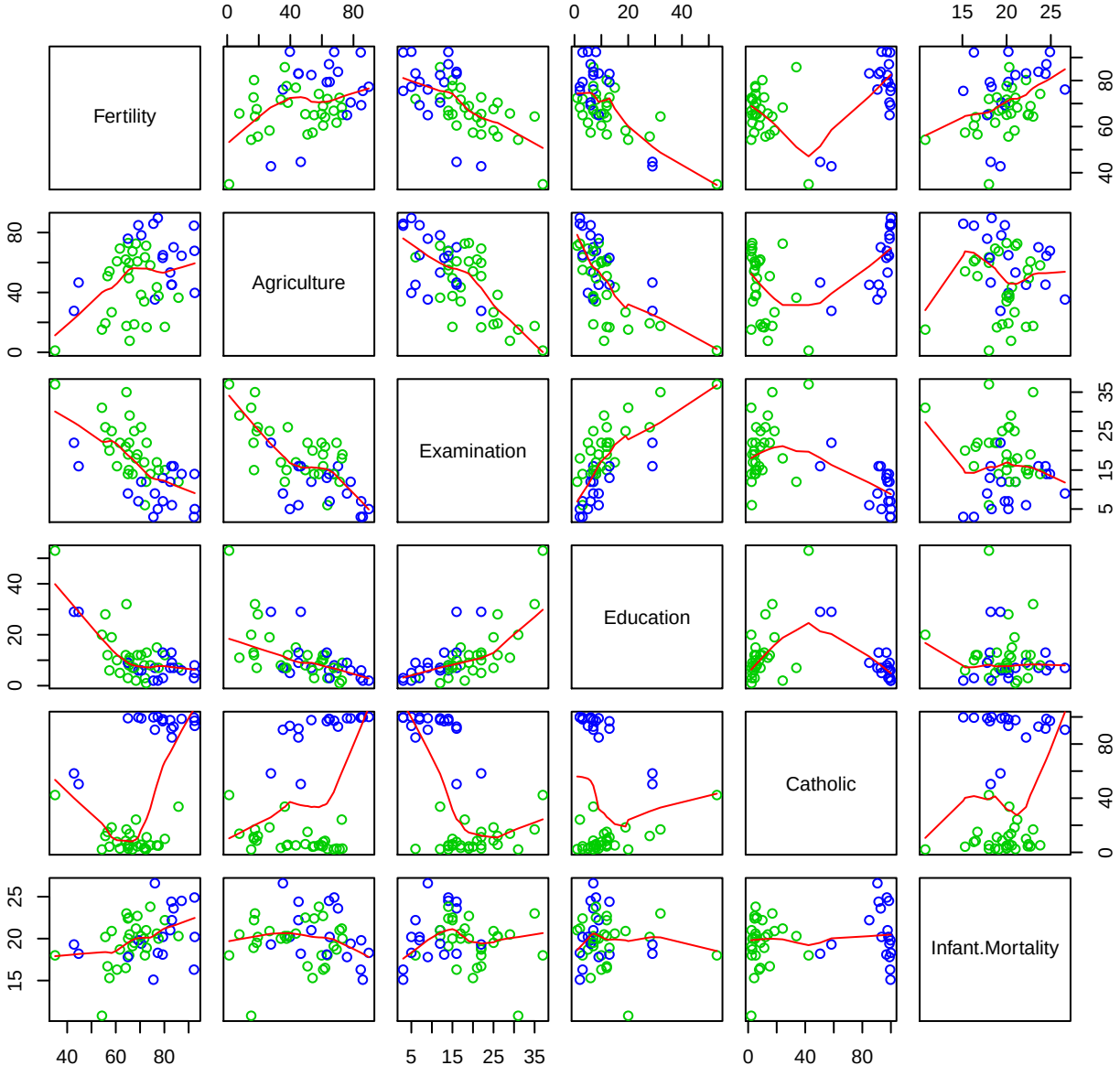


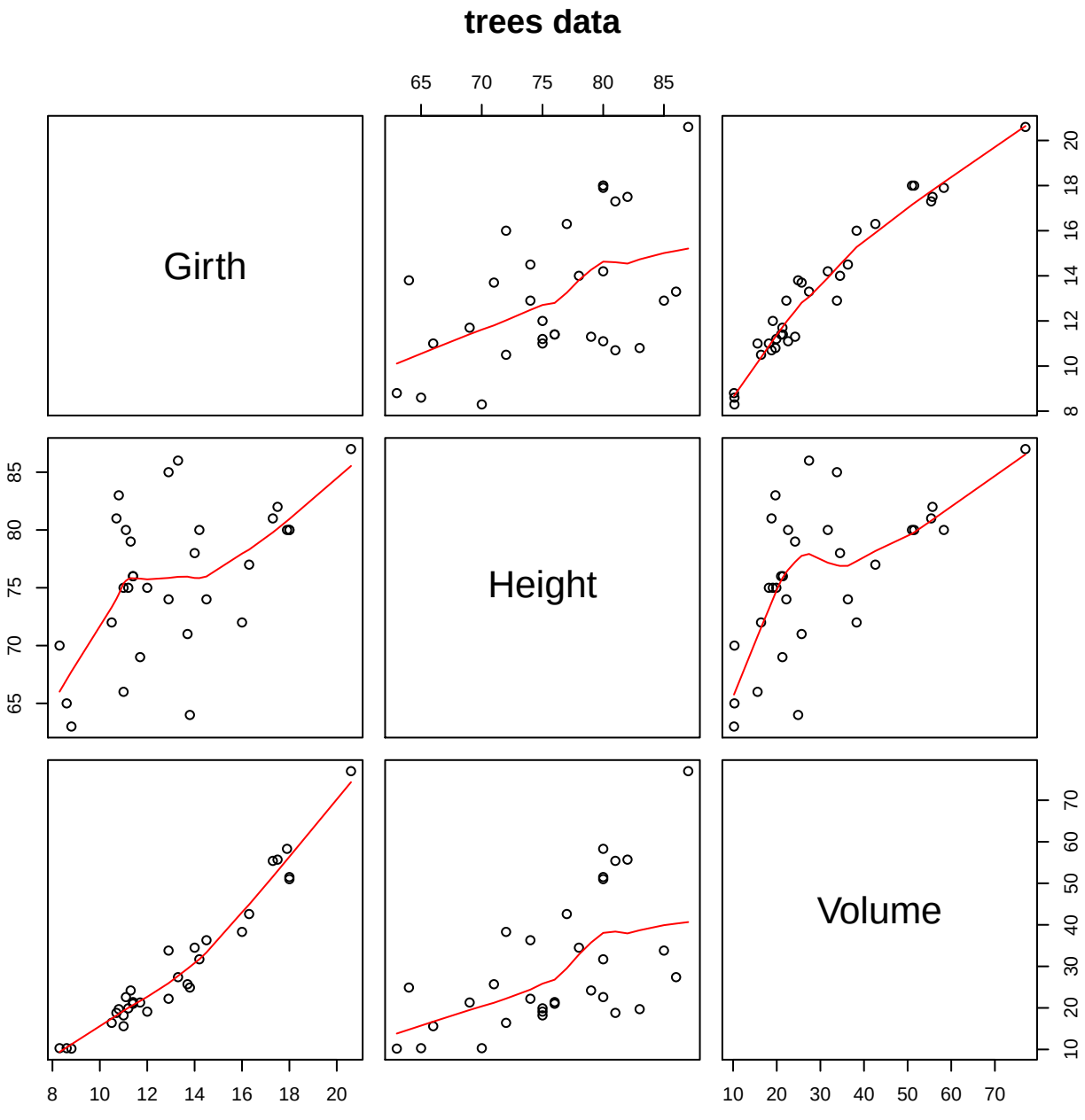
help("quakes")

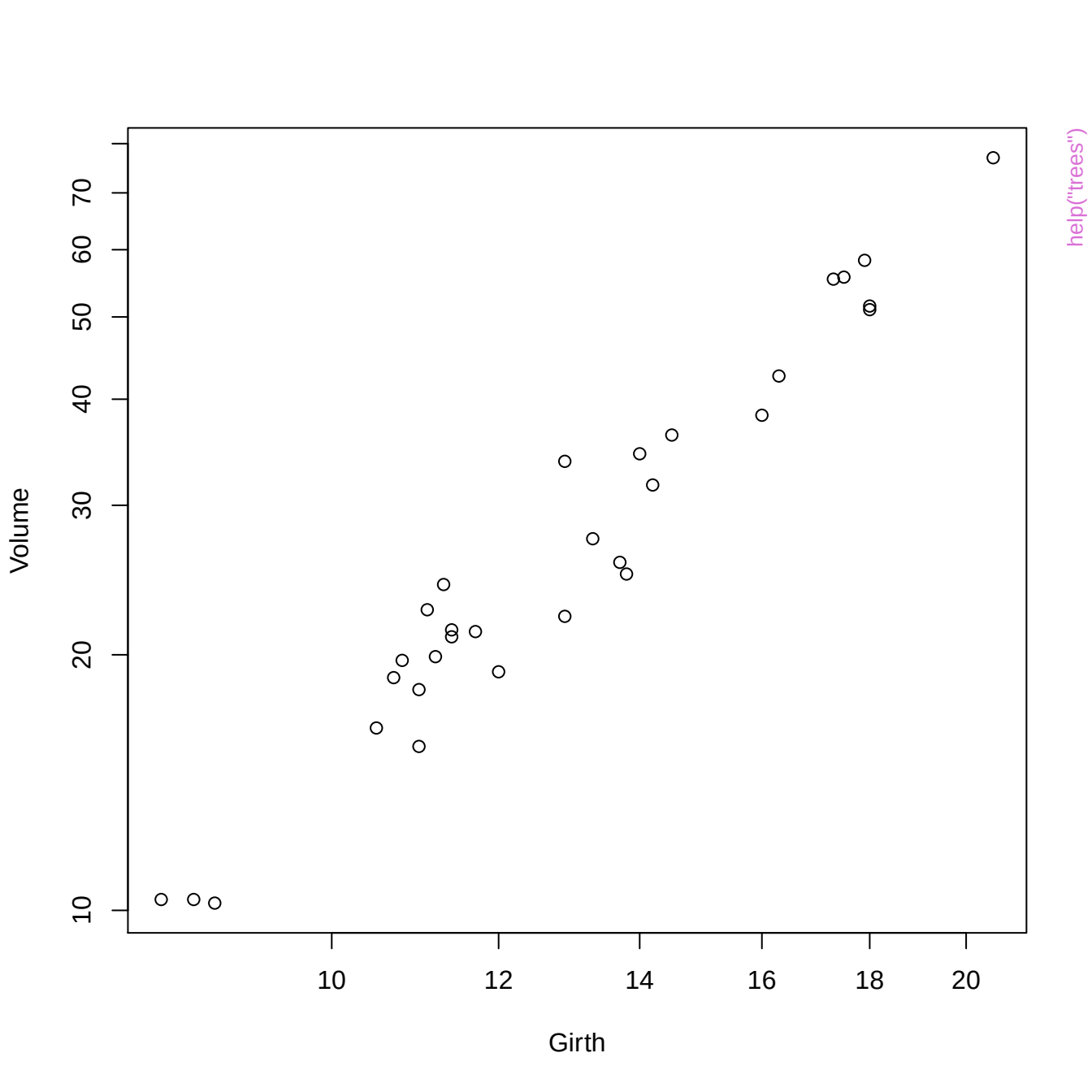

sunspot.month [stats]
sunspot.month
0
50
100
150
200
250
1750
1800
1850
1900
1950
2000
Time
help("sunspot.month")

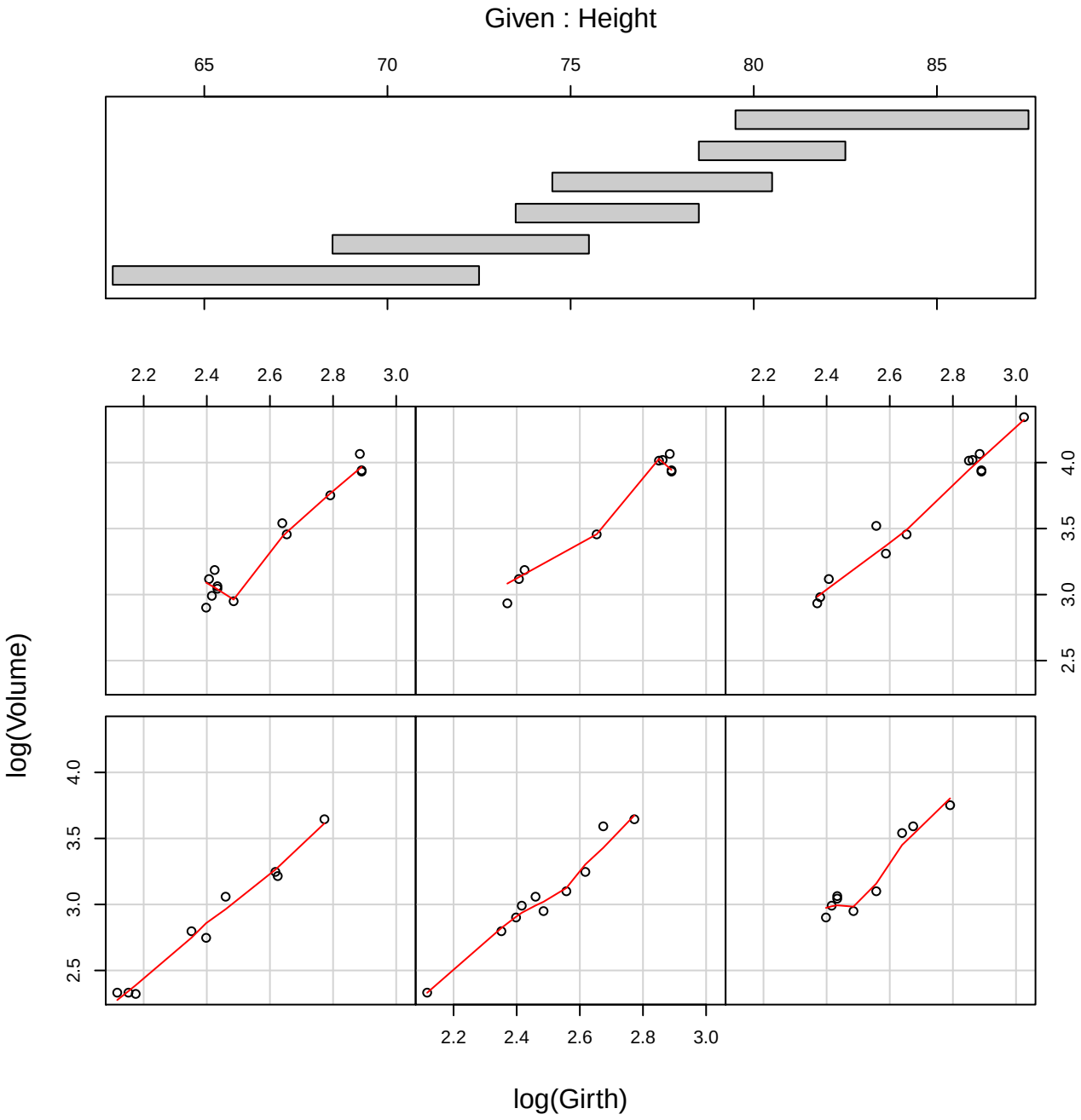

sunspots data
Monthly sunspot numbers
0
50
100
150
200
250
1750
1800
1850
1900
1950
Year
help("sunspots")

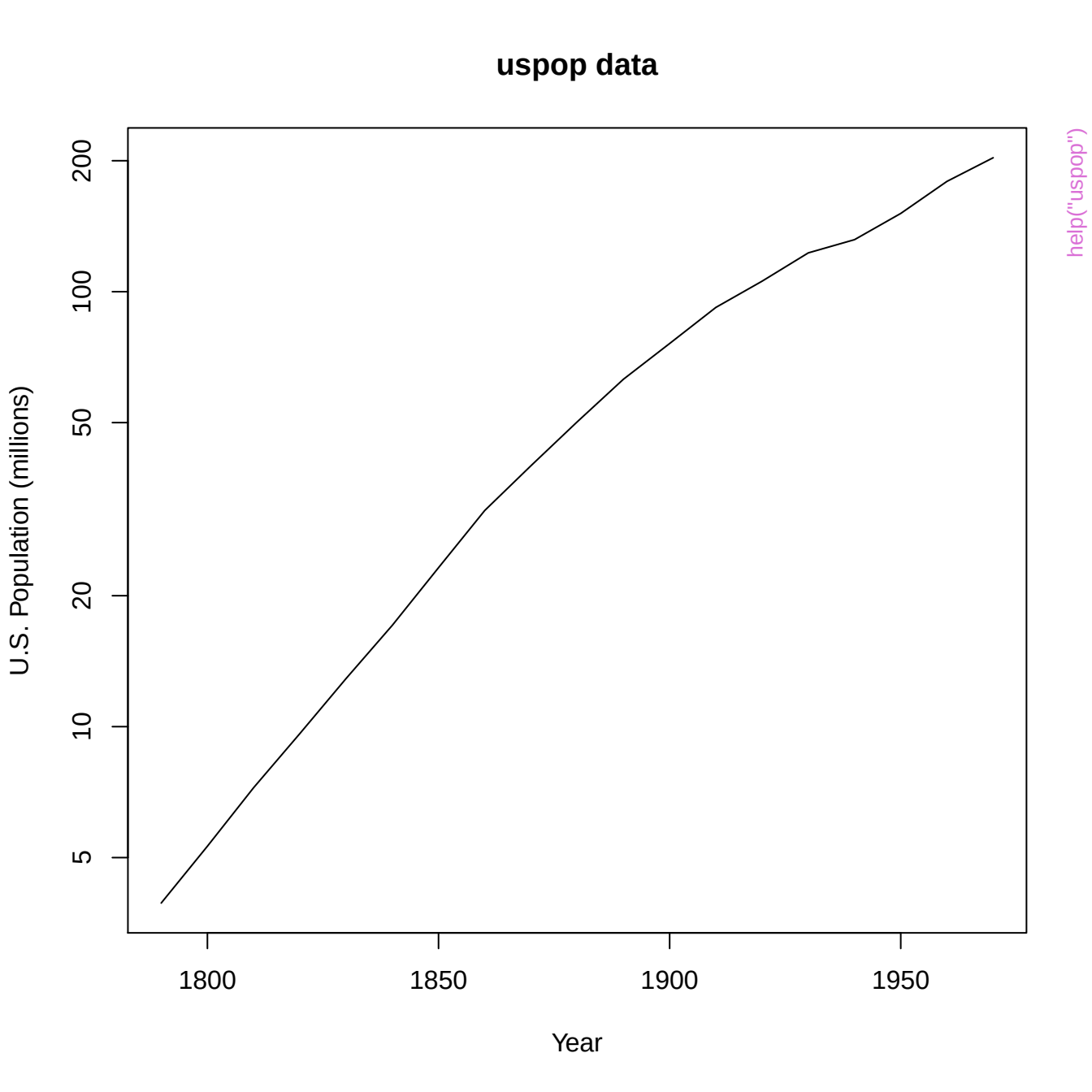
swiss data

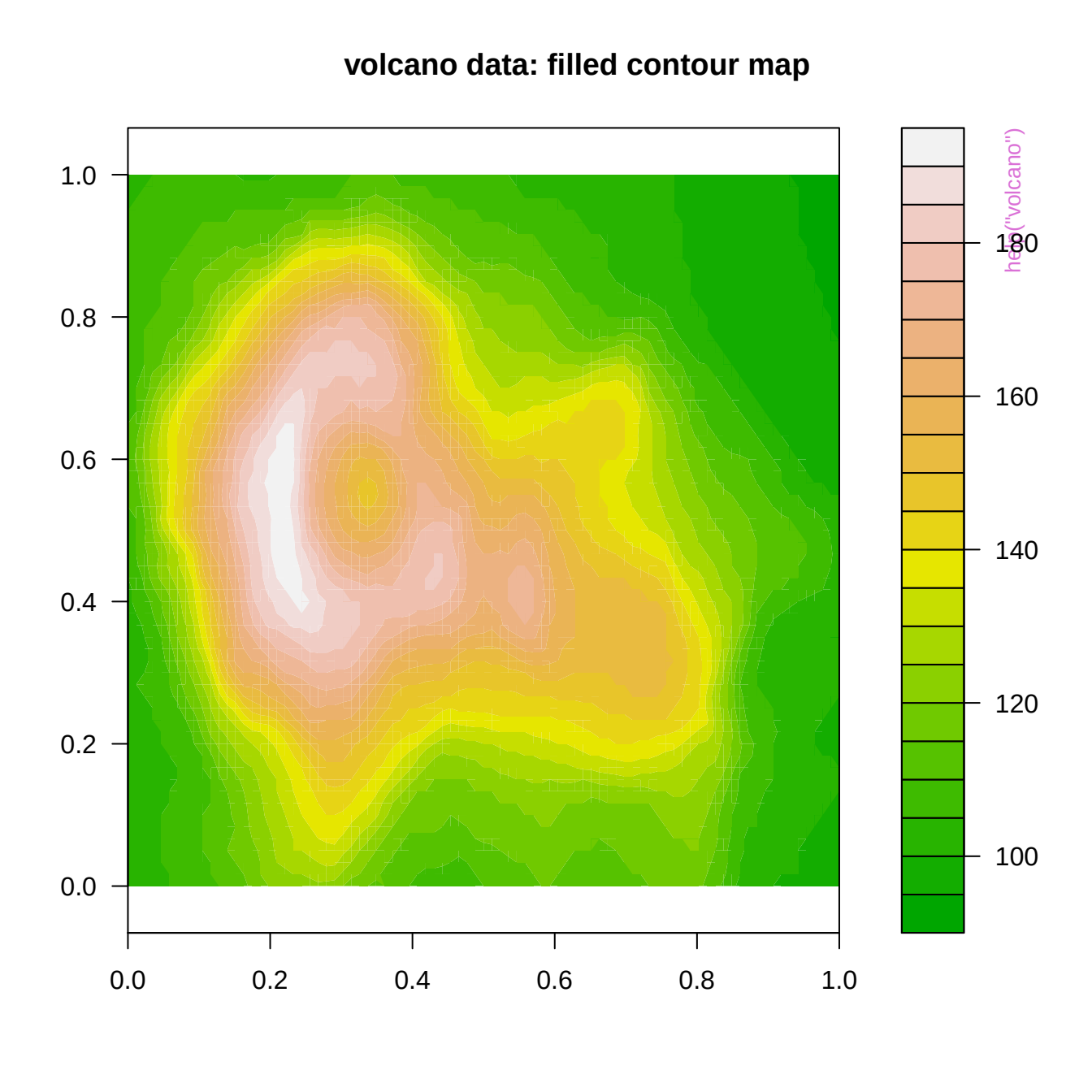

Fertility
Agriculture
Examination
Education
Catholic
Infant.Mortality
help("swiss")

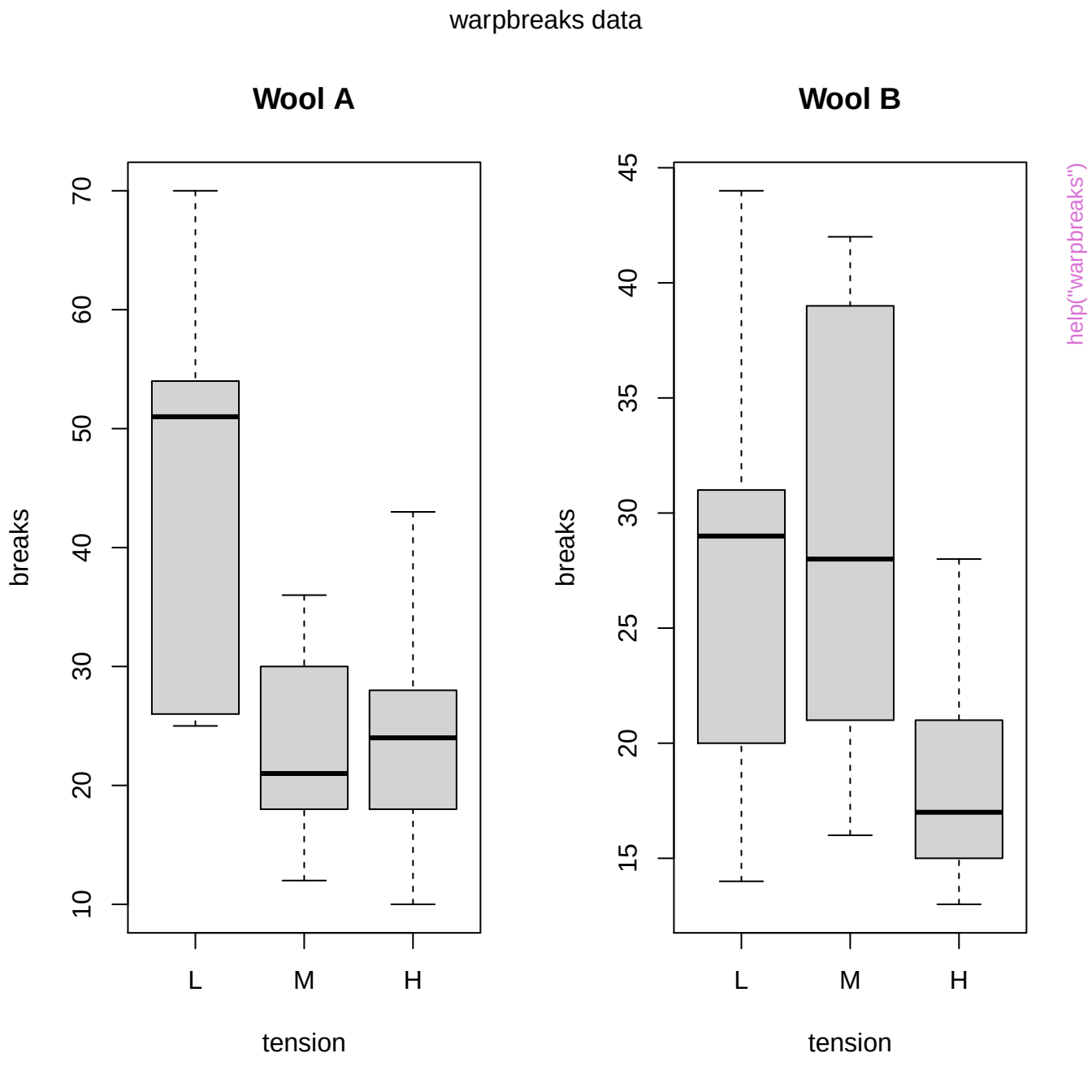

trees data
Girth
Height
Volume
help("trees")

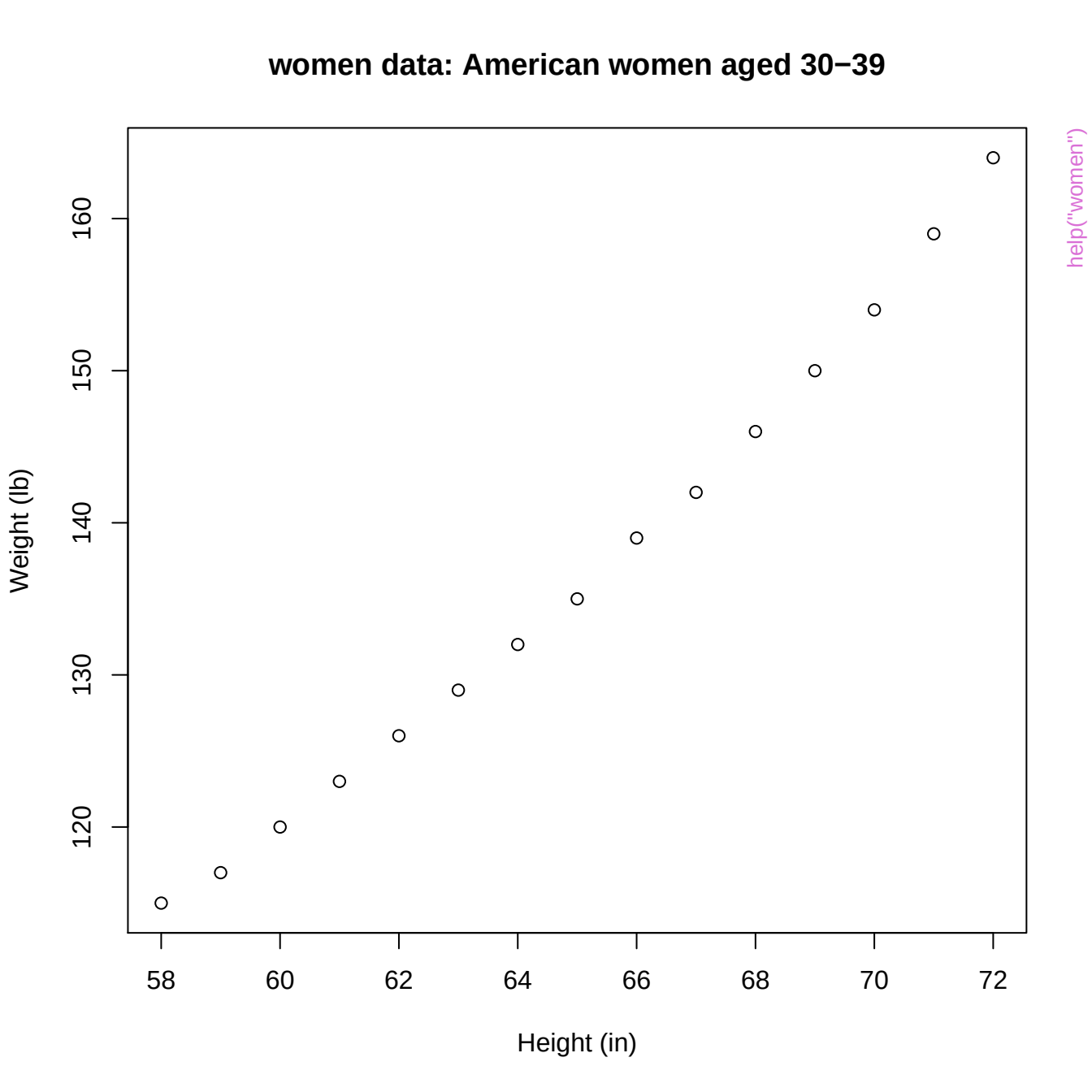

Volume
10
20
30
40
50
60
70
10
12
14
16
18
20
Girth
help("trees")

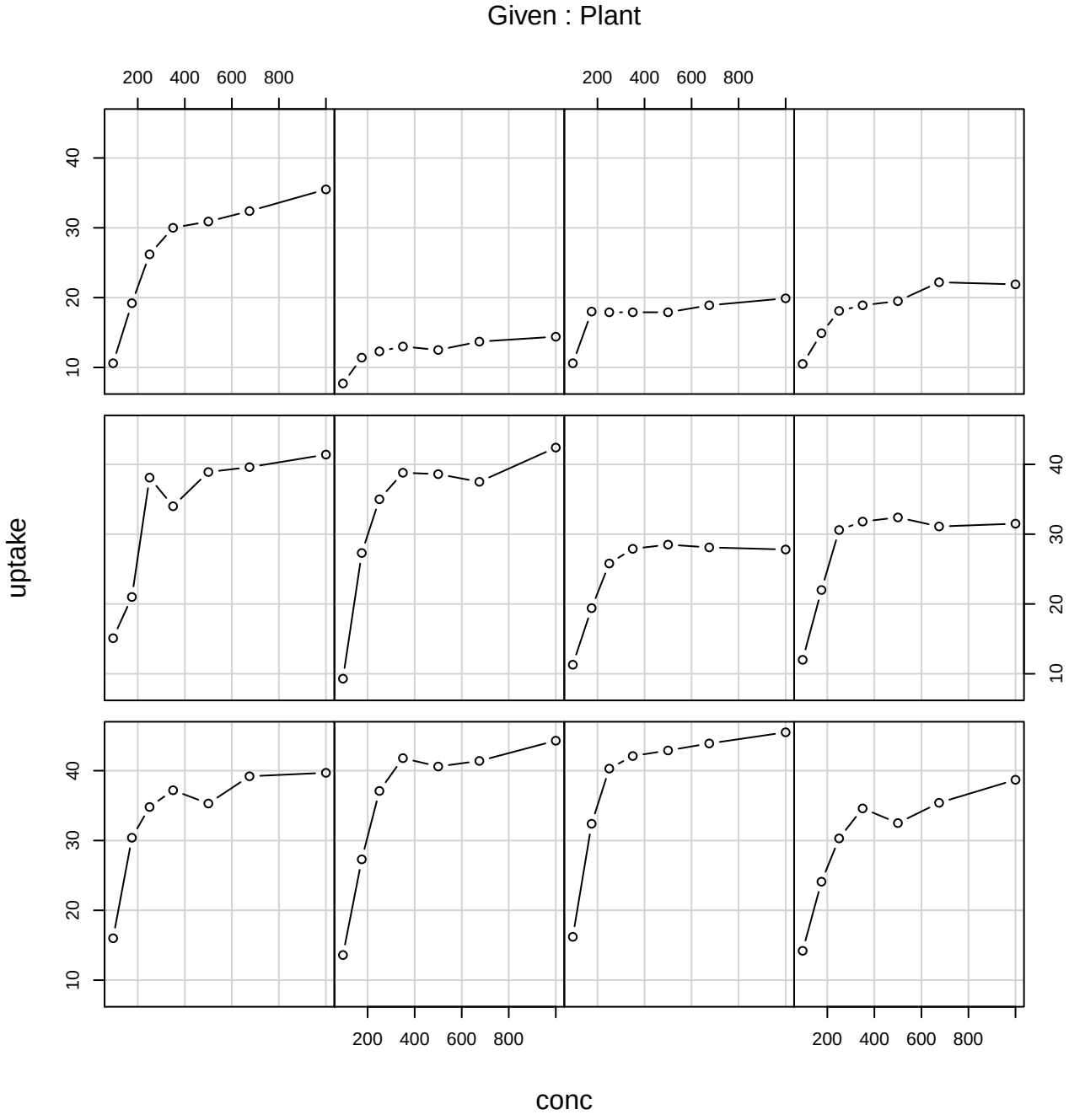

Given : Height
65
70
75
80
85
2.2
2.4
2.6
2.8
3.0
2.5
3.0
3.5
4.0
log(Volume)
log(Girth)
help("trees")


uspop data
U.S. Population (millions)
5
10
20
50
100
200
1800
1850
1900
1950
Year
help("uspop")


volcano data: filled contour map
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
180
160
140
120
100
heat("volcano")


warpbreaks data
Wool A
Wool B
breaks
tension
L
M
H
10
20
30
40
50
60
70
15
20
25
30
35
40
45
help("warpbreaks")


women data: American women aged 30−39
Weight (lb)
120
130
140
150
160
58
60
62
64
66
68
70
72
Height (in)
help("women")


Given : Plant
200 400 600 800
200 400 600 800
10 20 30 40
10 20 30 40
uptake
conc
200 400 600 800
200 400 600 800
help("zCO2")