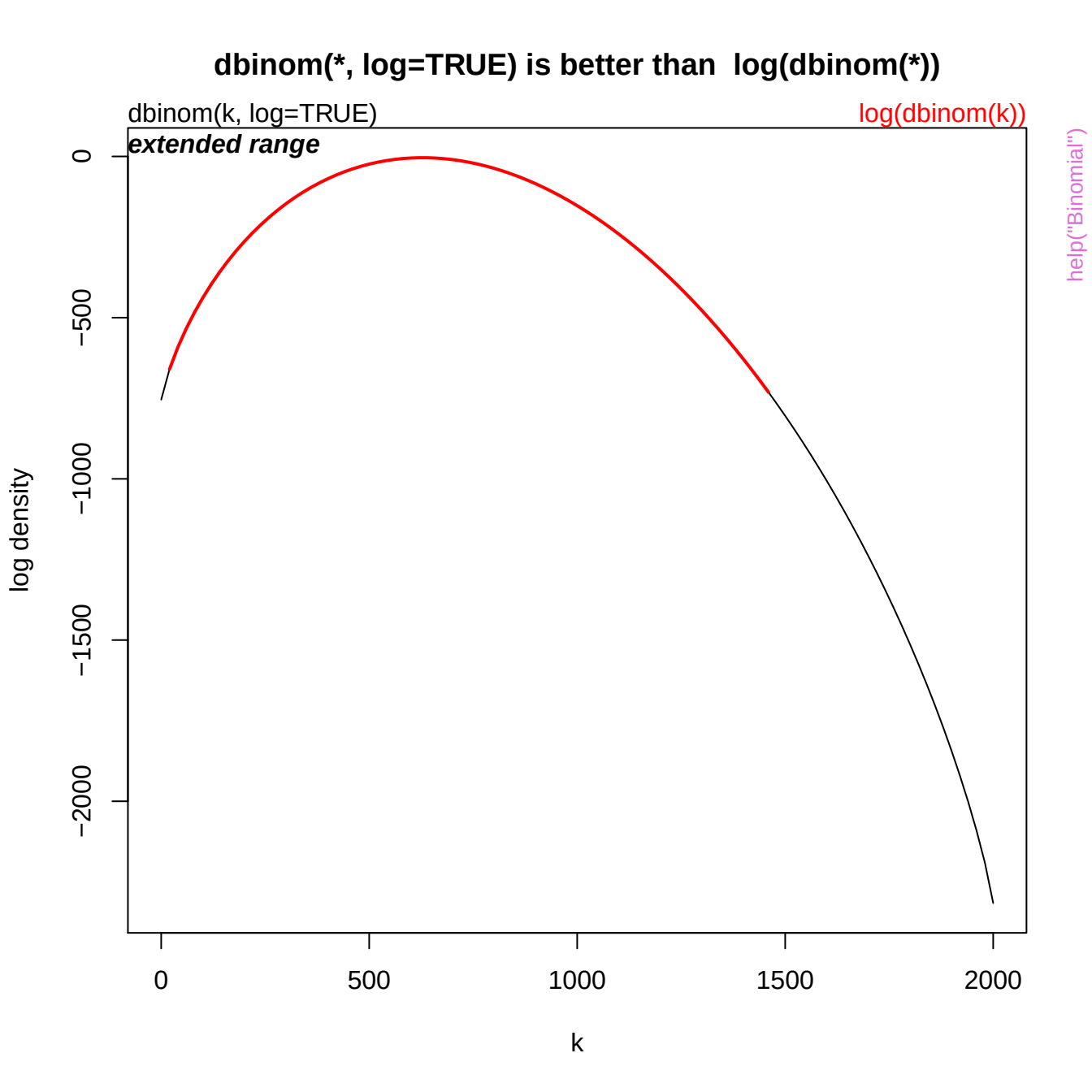
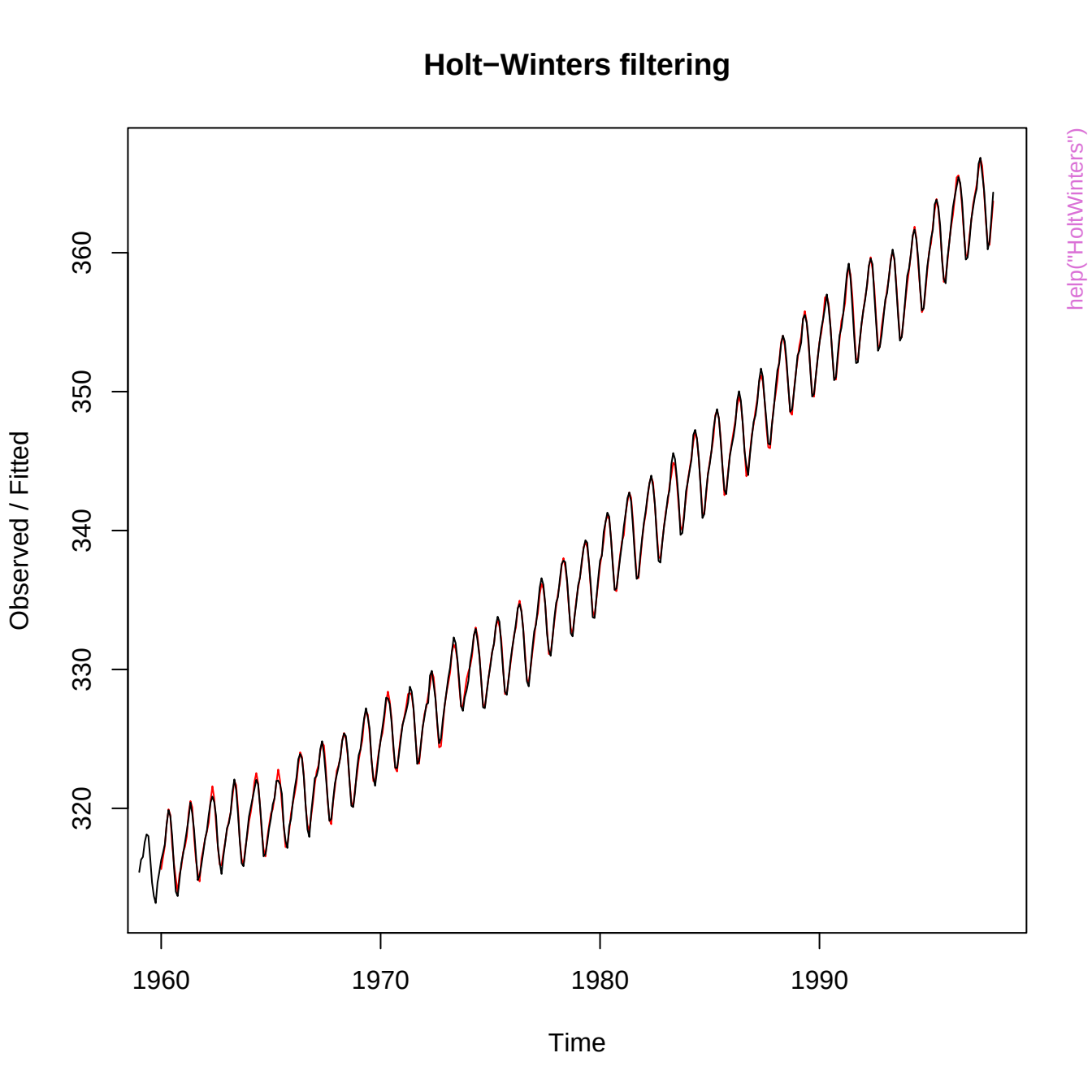
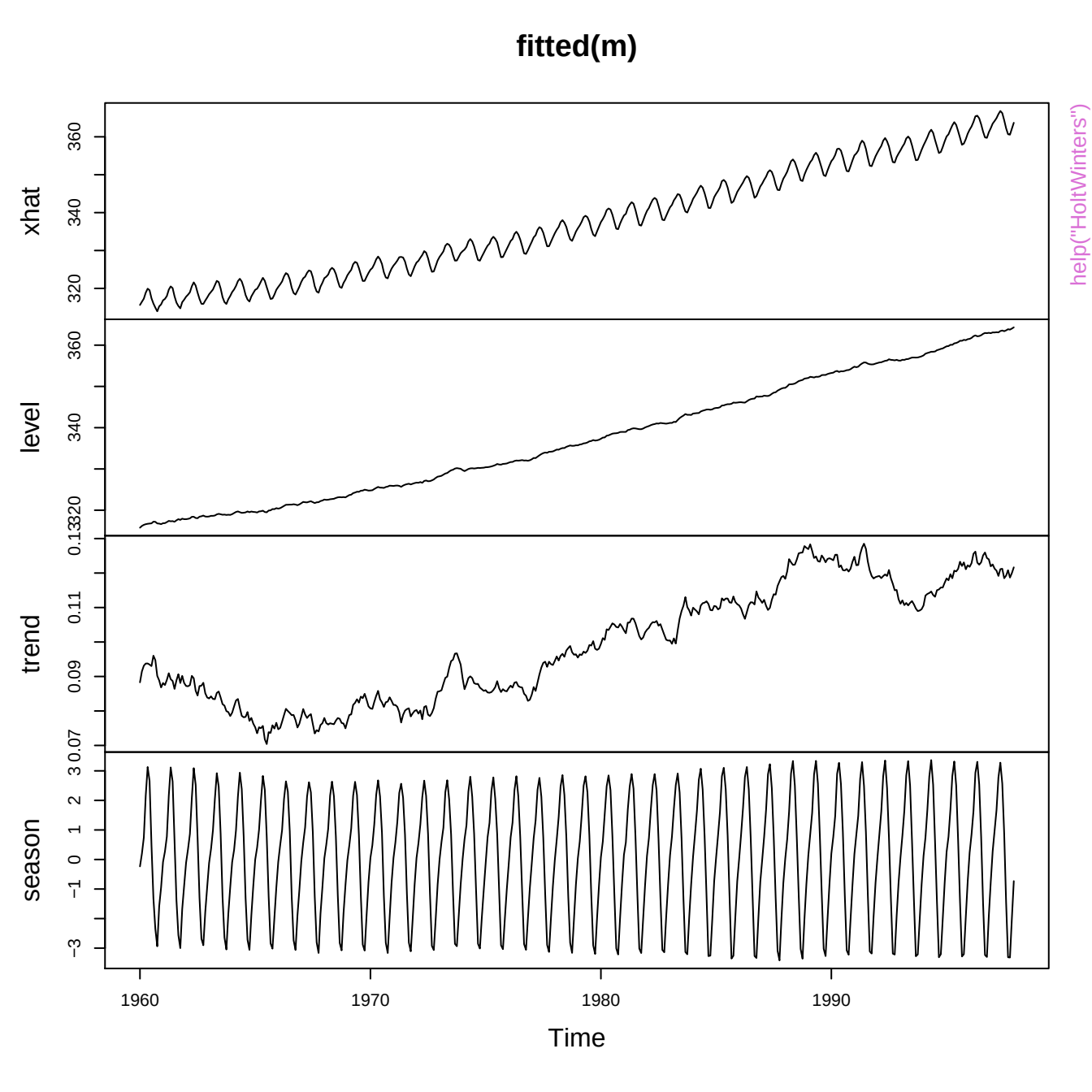
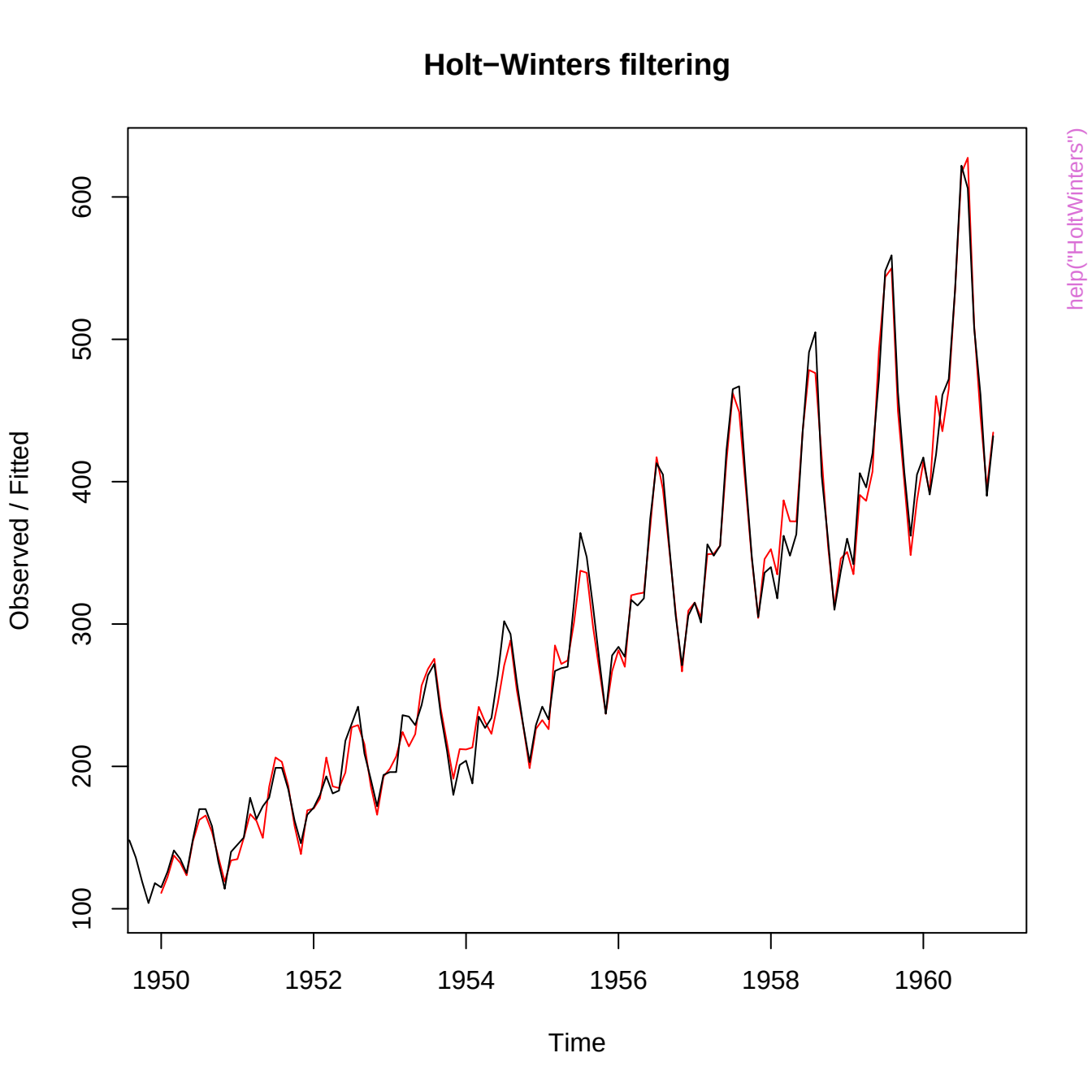
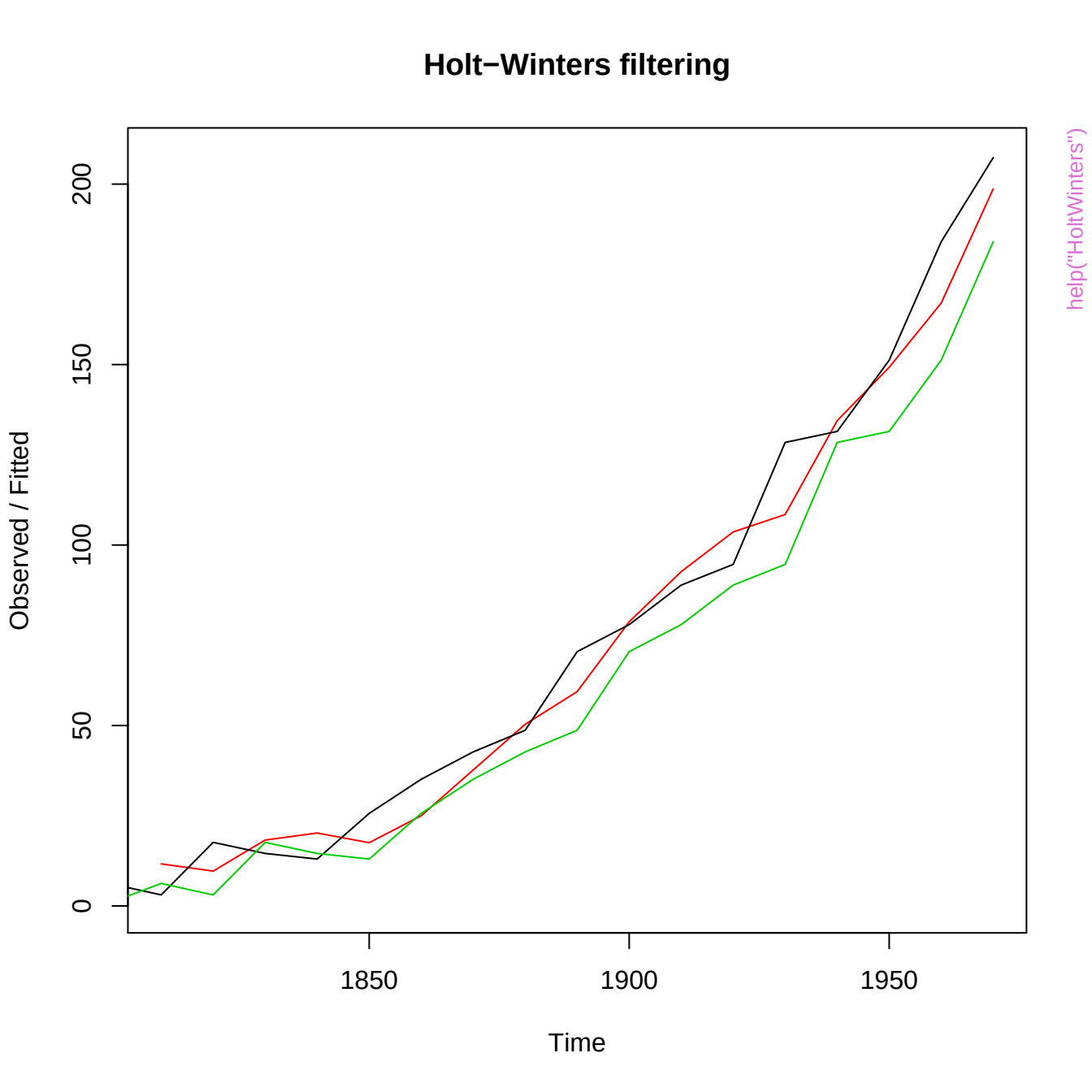

dbinom(*, log=TRUE) is better than log(dbinom(*))
dbinom(k, log=TRUE)
log(dbinom(k))
extended range
help("Binomial")
log density
0
−500
−1000
−1500
−2000
0
500
1000
1500
2000
k

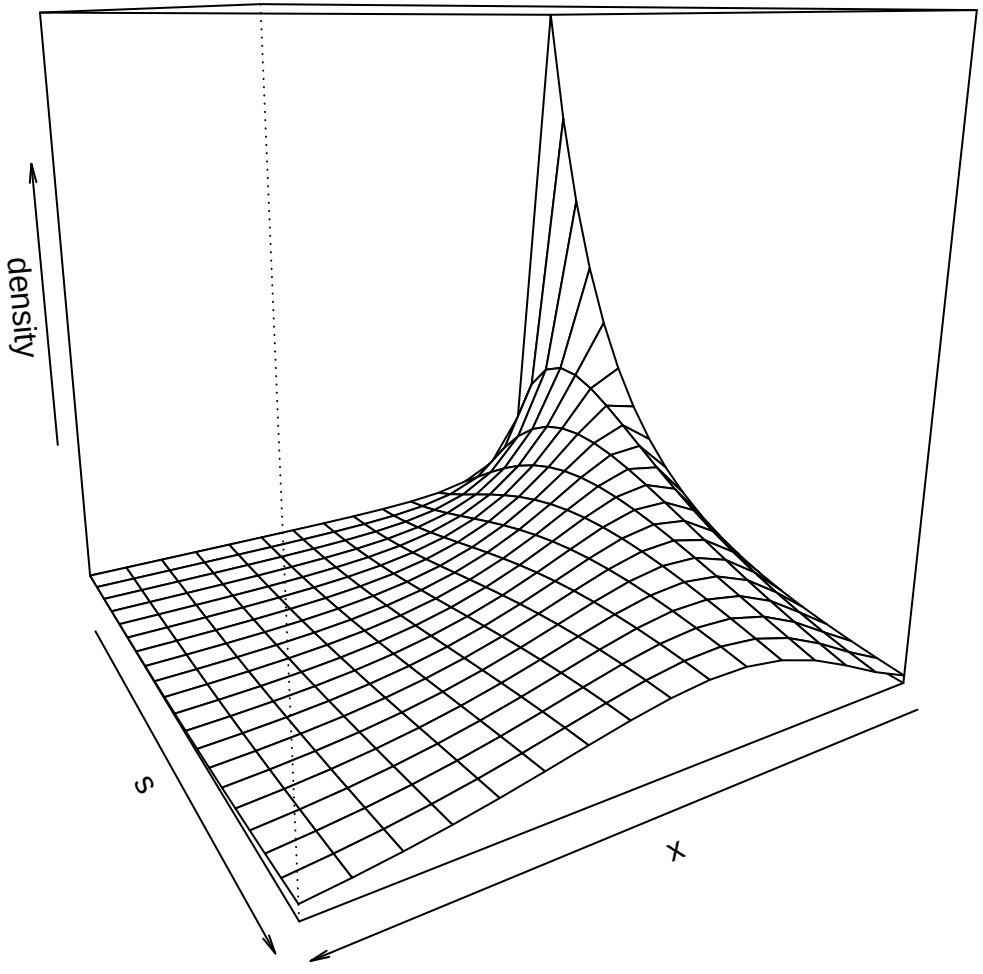

Holt−Winters filtering
Observed / Fitted
320
330
340
350
360
1960
1970
1980
1990
Time
help("HoltWinters")


fitted(m)
xhat
level
trend
season
Time
1960
1970
1980
1990
help("HoltWinters")

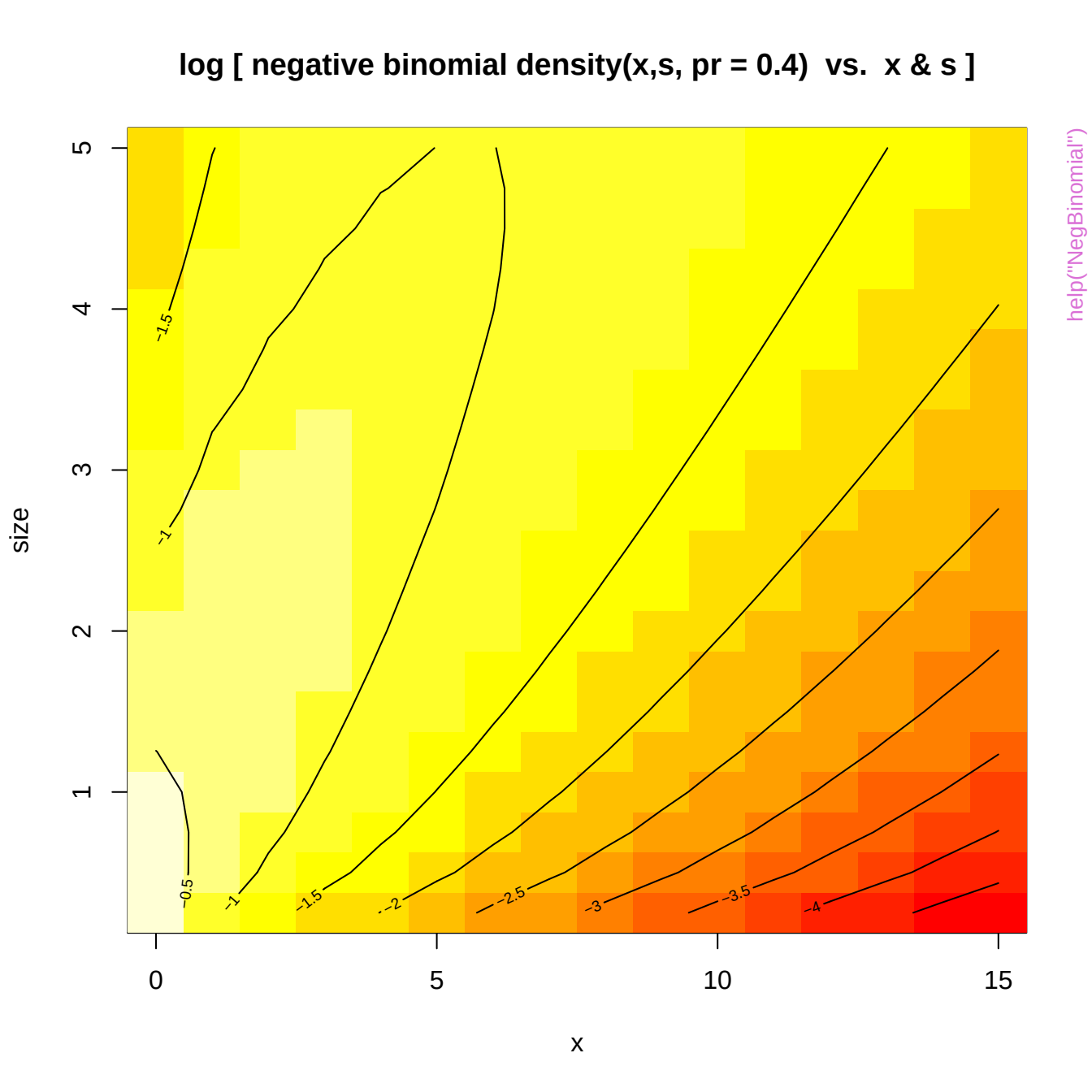

Holt−Winters filtering
Observed / Fitted
100
200
300
400
500
600
1950
1952
1954
1956
1958
1960
Time
help("HoltWinters")

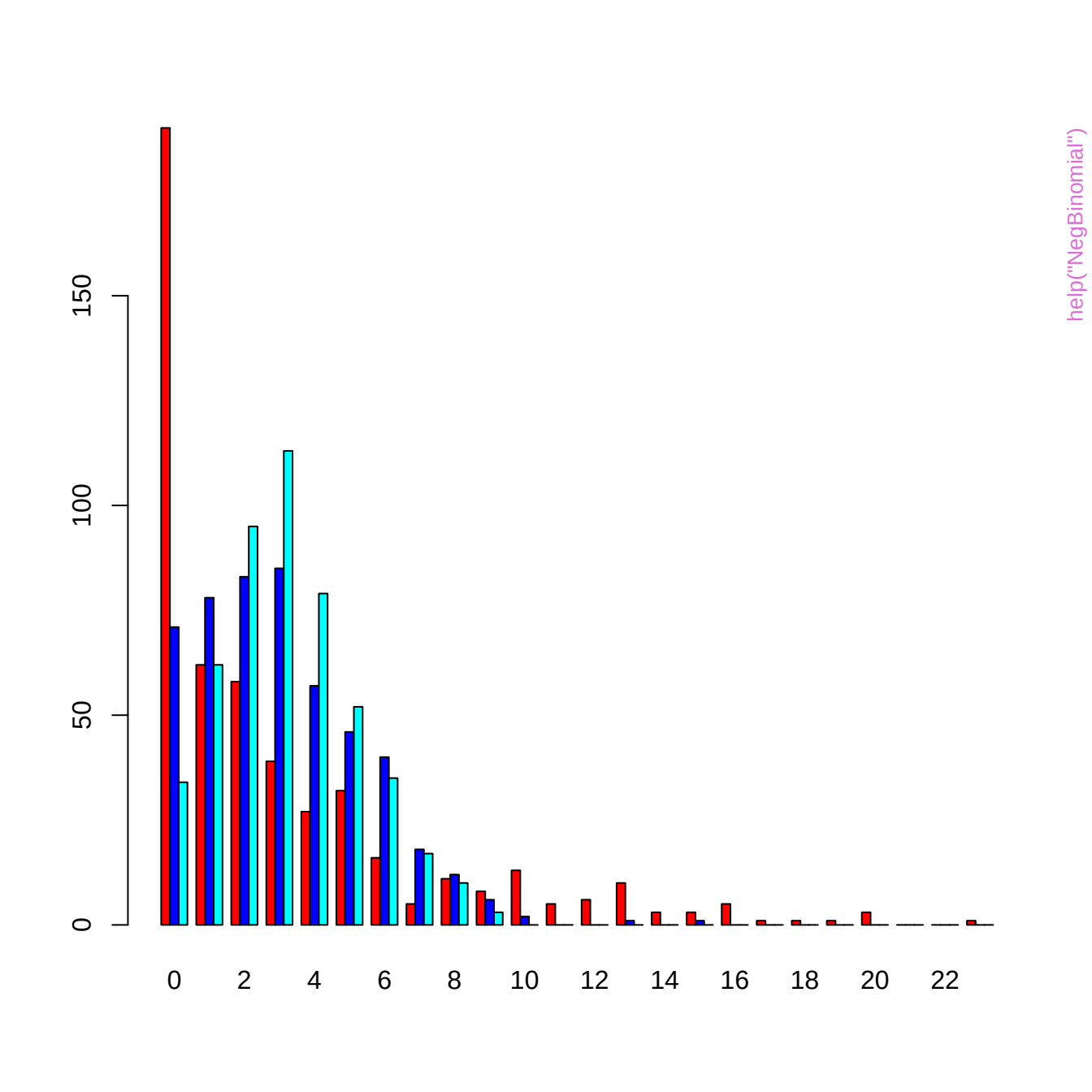

Holt−Winters filtering
Observed / Fitted
0
50
100
150
200
1850
1900
1950
Time
help("HoltWinters")

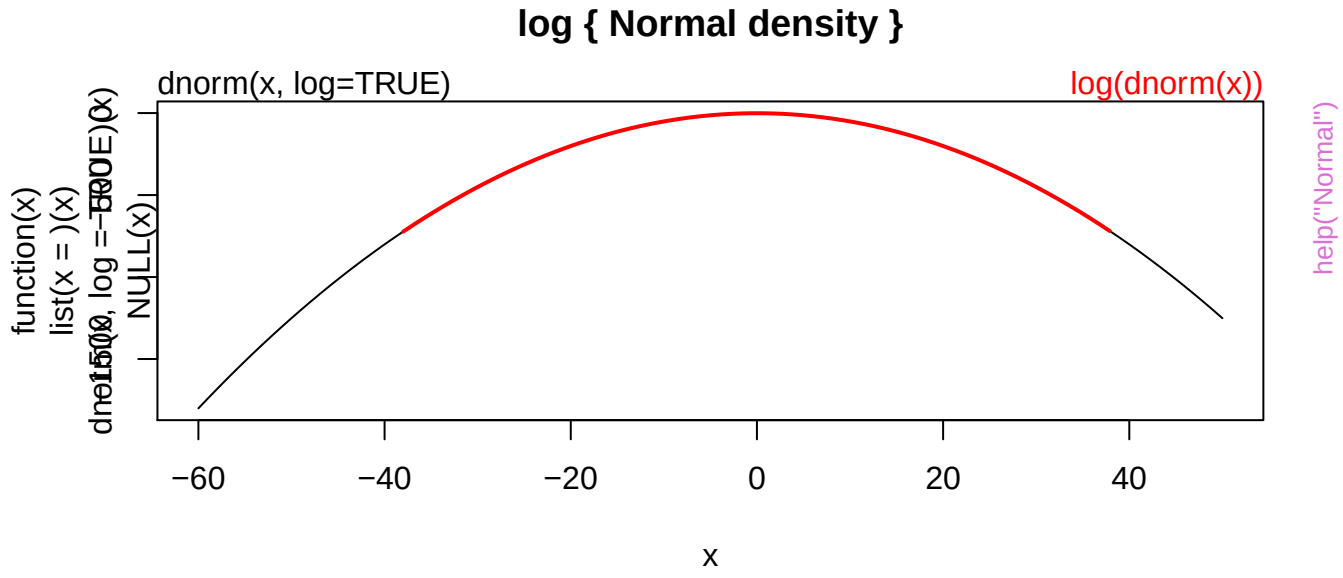
negative binomial density(x,s, pr = 0.4) vs. x & s

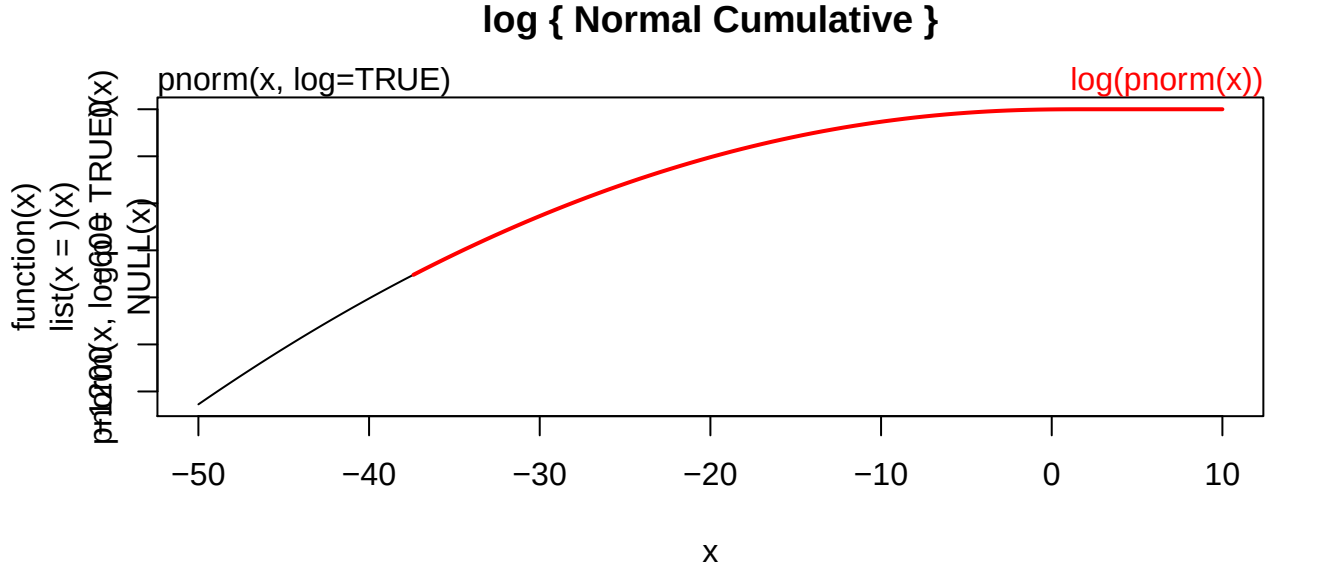


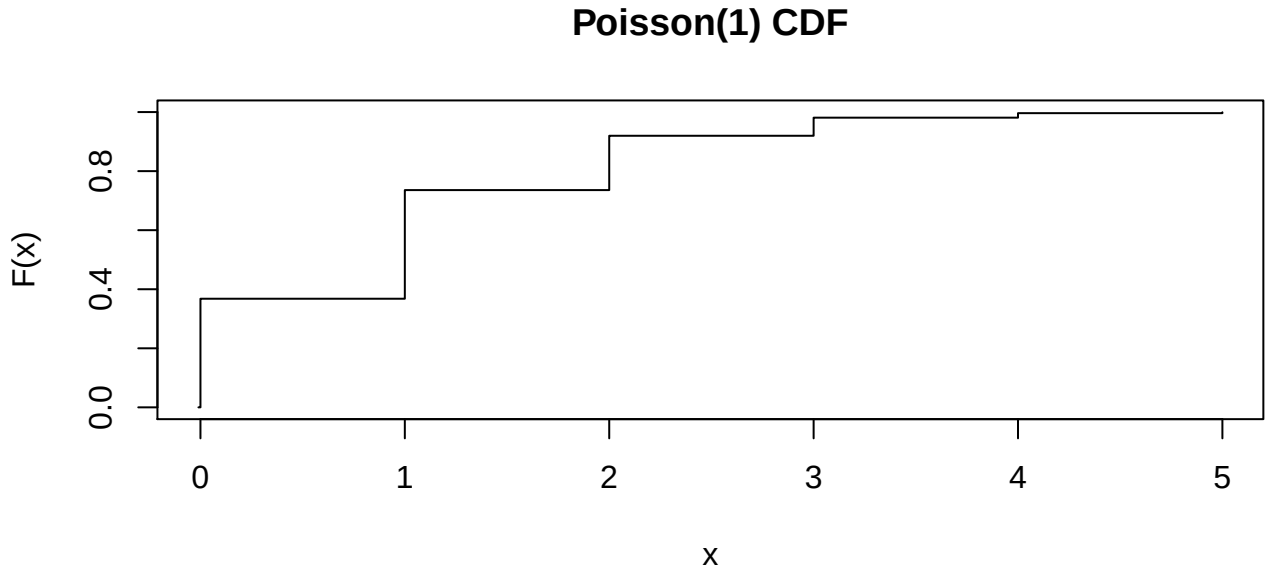
help("NegBinomial")


log [negative binomial density(x,s, pr = 0.4) vs. x & s]
size
x
0
5
10
15
1
2
3
4
5
−0.5
−1
−1.5
−2
−2.5
−3
−3.5
−4
help("NegBinomial")

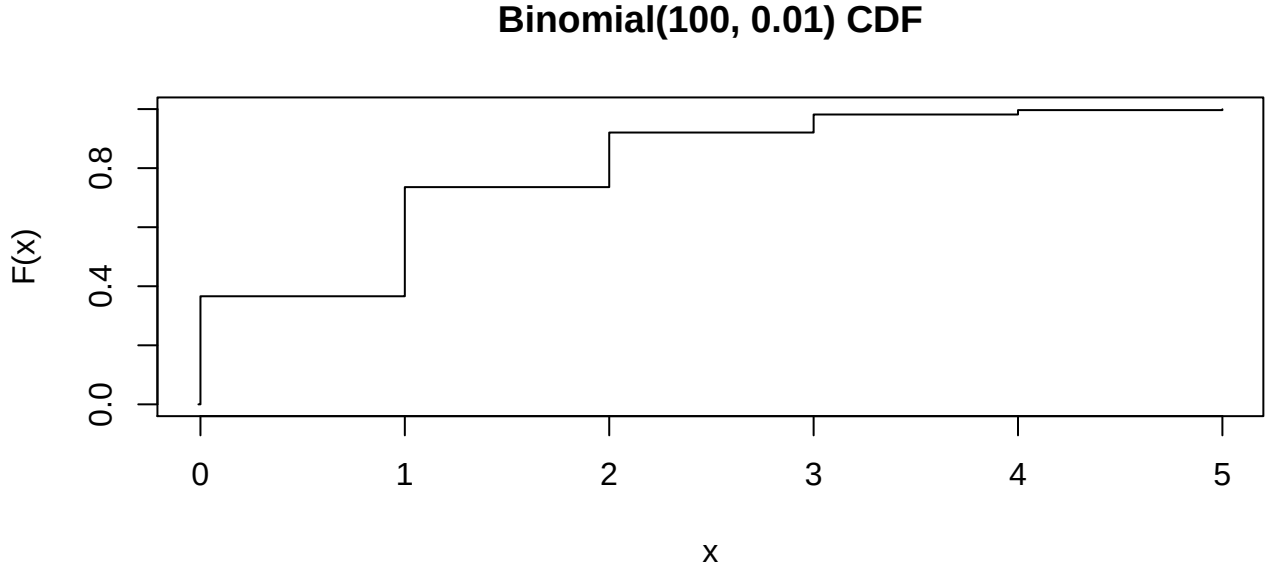

0
50
100
150
0
2
4
6
8
10
12
14
16
18
20
22
help("NegBinomial")


log { Normal density }
dnorm(x, log=TRUE)
log(dnorm(x))
function(x)
list(x =)(x)
NULL(x)
−60
−40
−20
0
20
40
x
help("Normal")

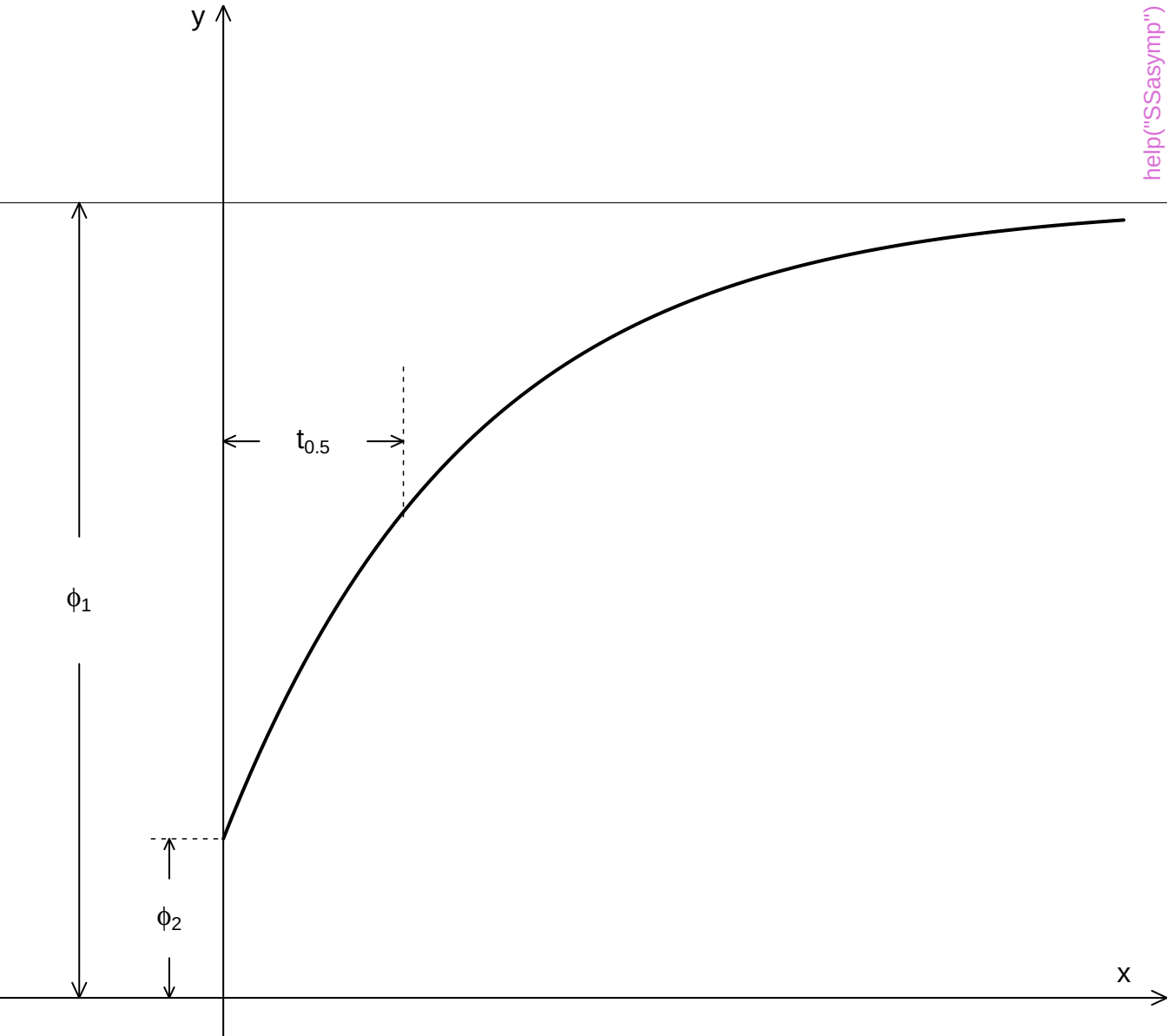

log { Normal Cumulative }
pnorm(x, log=TRUE)
log(pnorm(x))
function(x)
list(x =)(x)
NULL(x)
−50
−40
−30
−20
−10
0
10
x



help("Poisson")

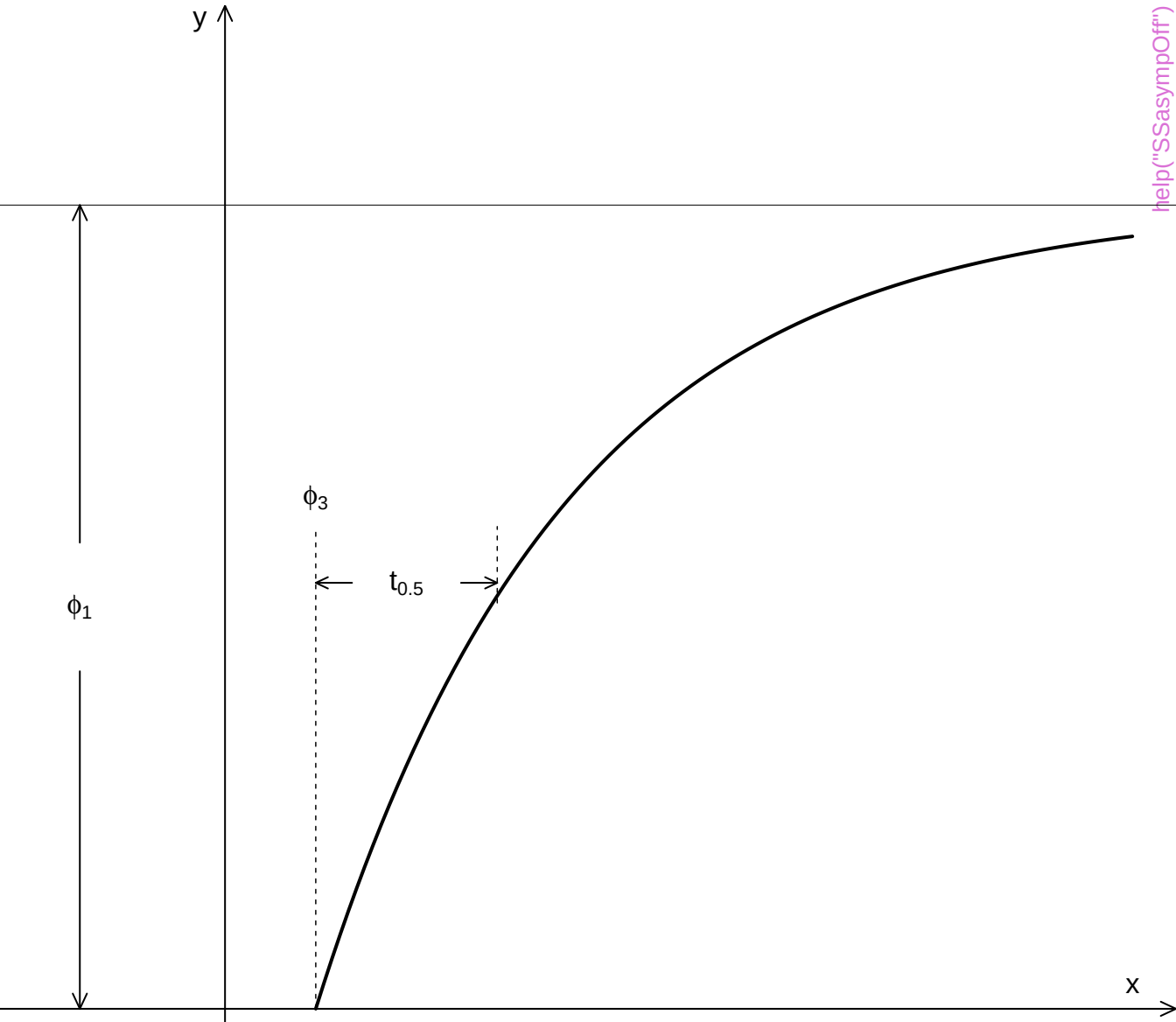


Parameters in the SSasymp model



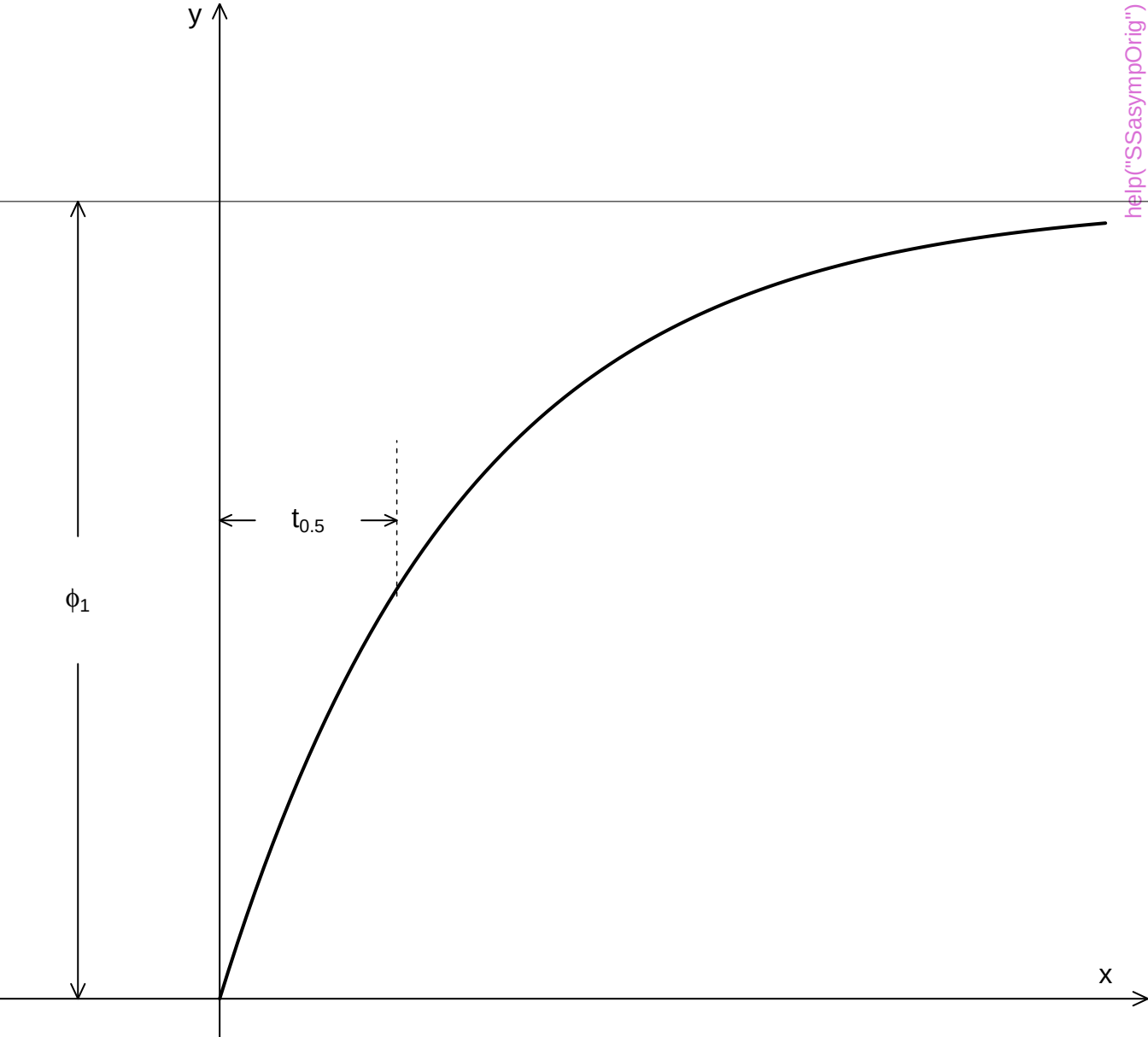
help("SSasymp")

Parameters in the SSasympOff model



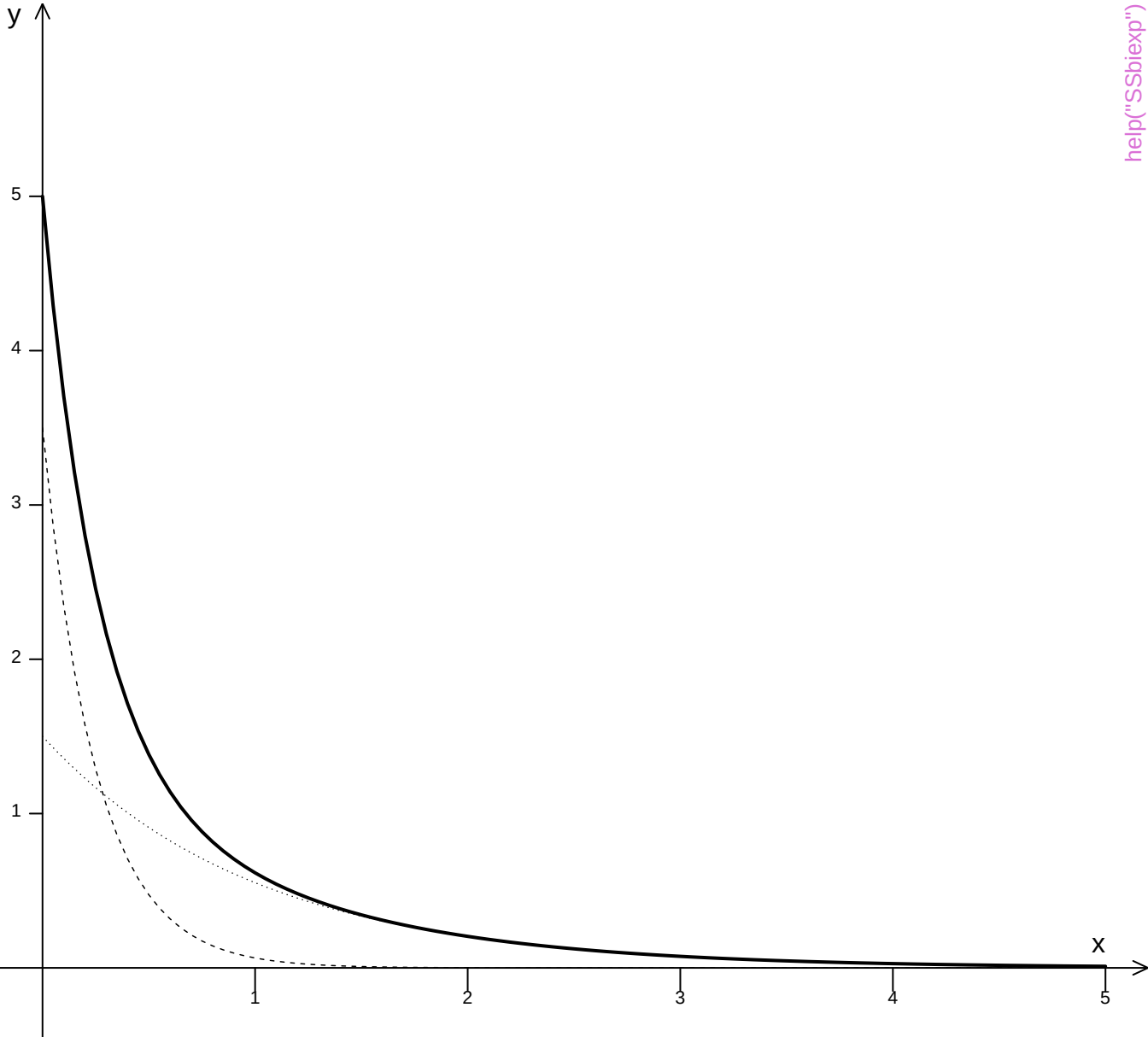
help("SSasympOff")

Parameters in the SSasympOrig model



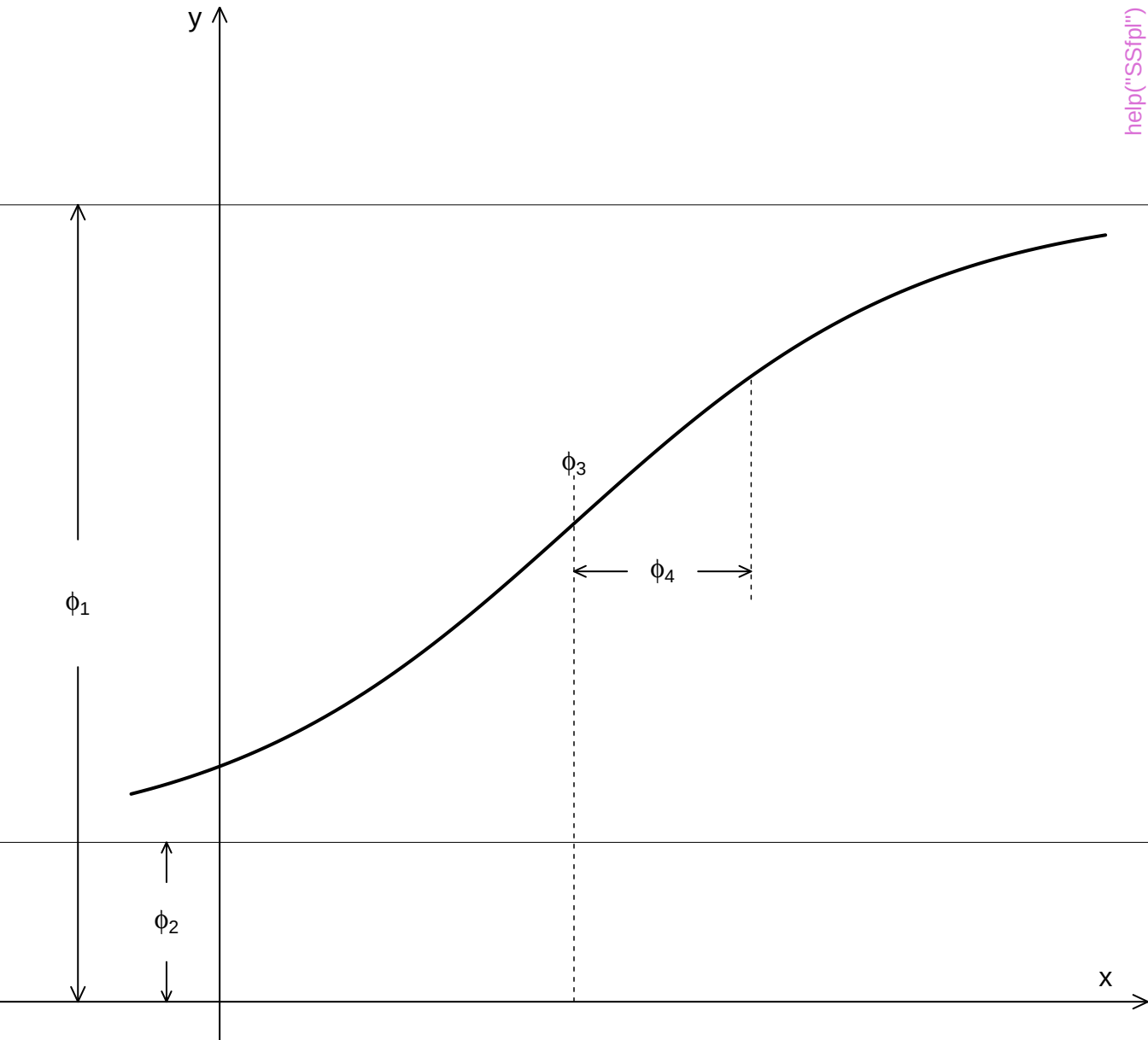
help("SSasympOrig")

Components of the SSbiexp model



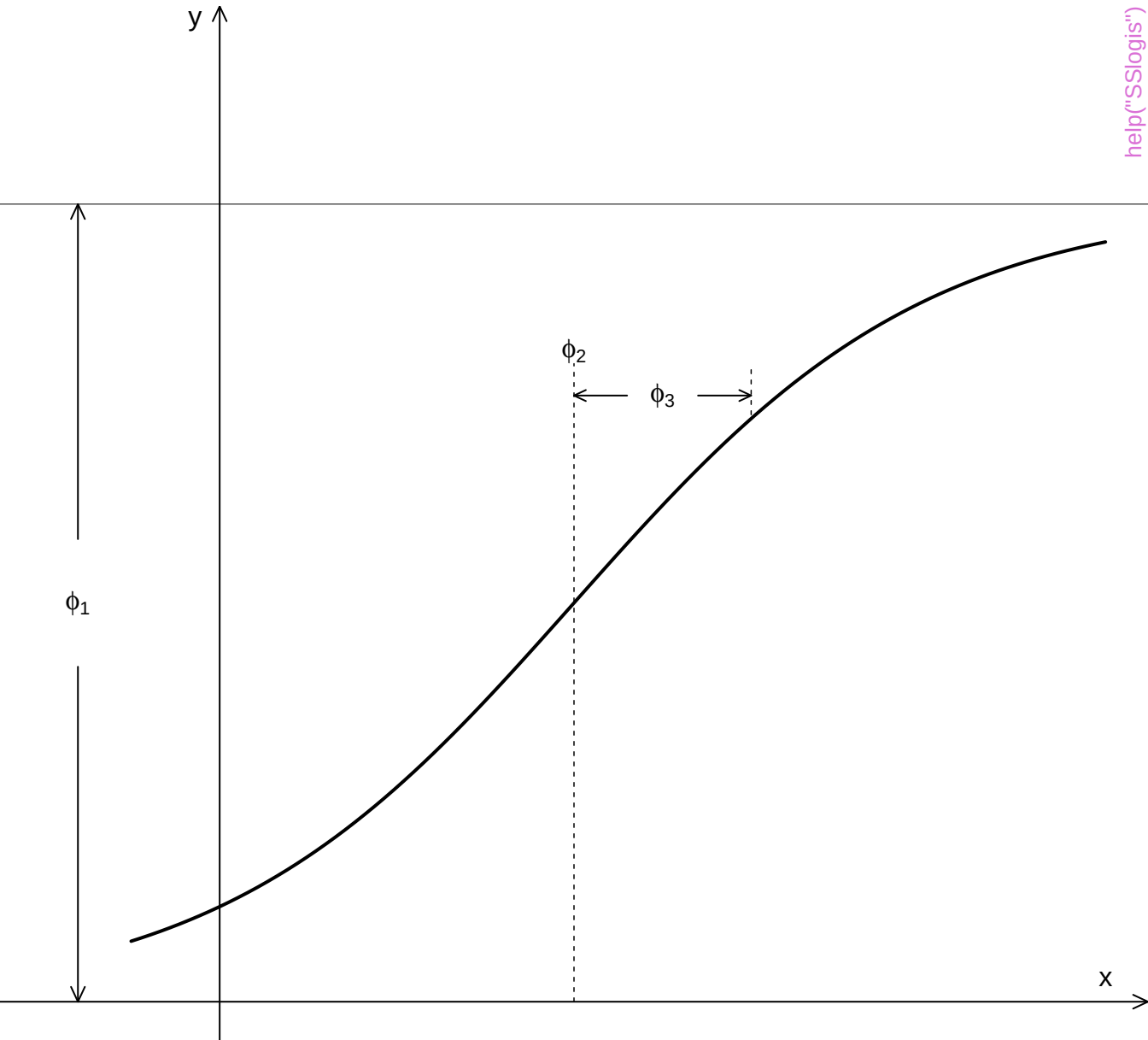
help("SSbiexp")

Parameters in the SSfpl model



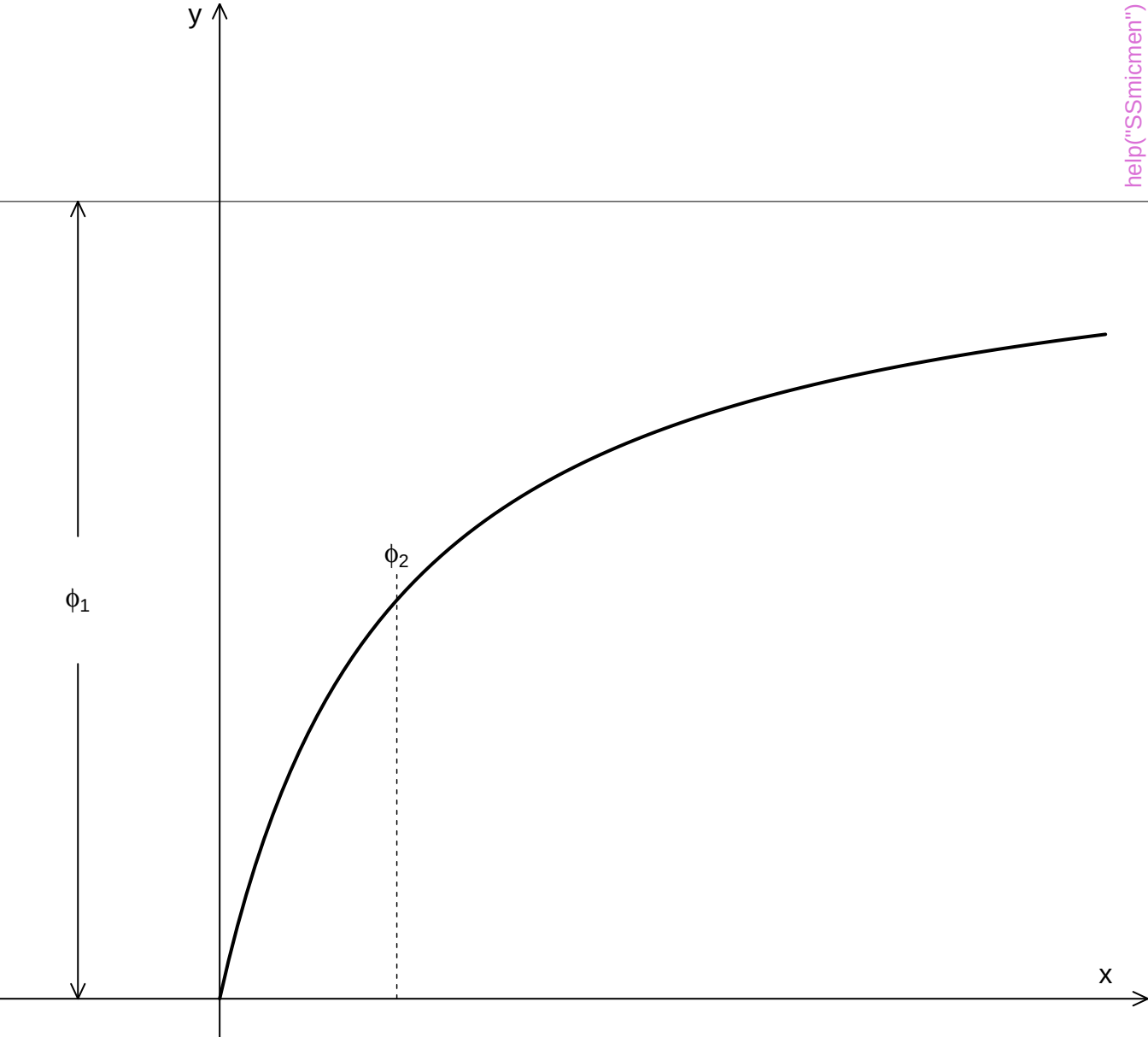
help("SSfpl")

Parameters in the SSlogis model

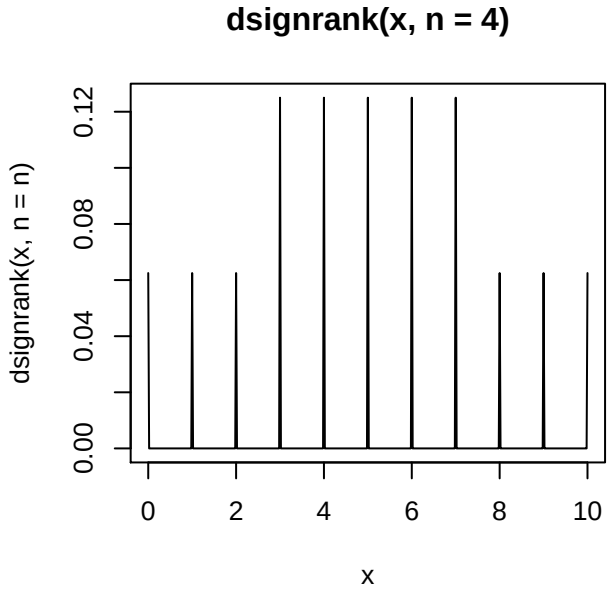


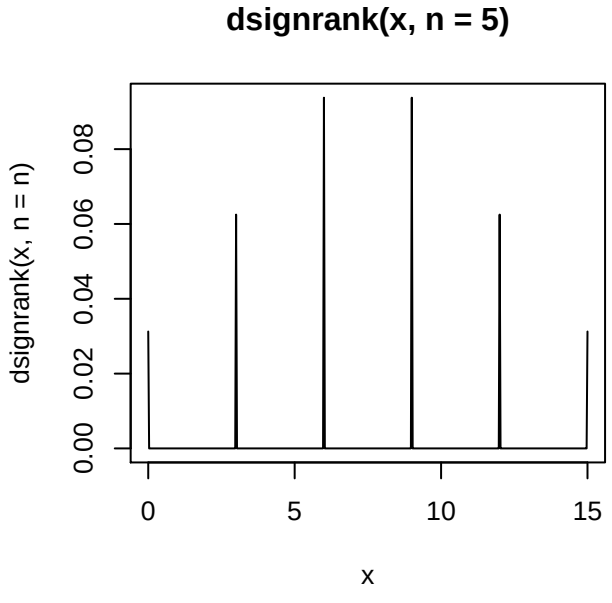
help("SSlogis")

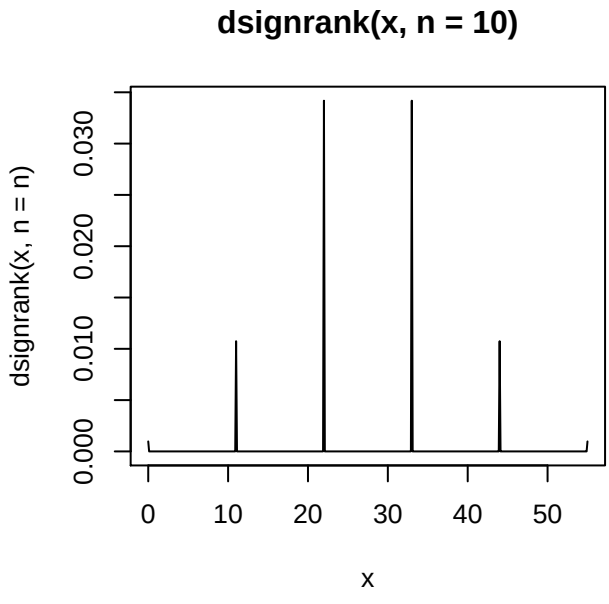
Parameters in the SSmicmen model

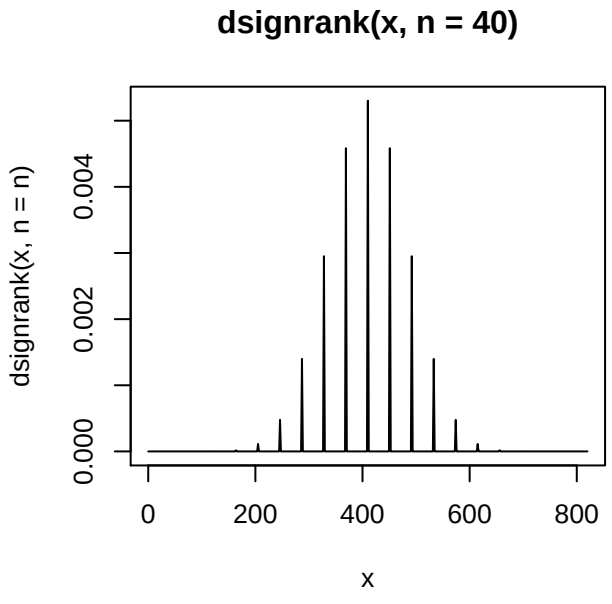


help("SSmicmen")

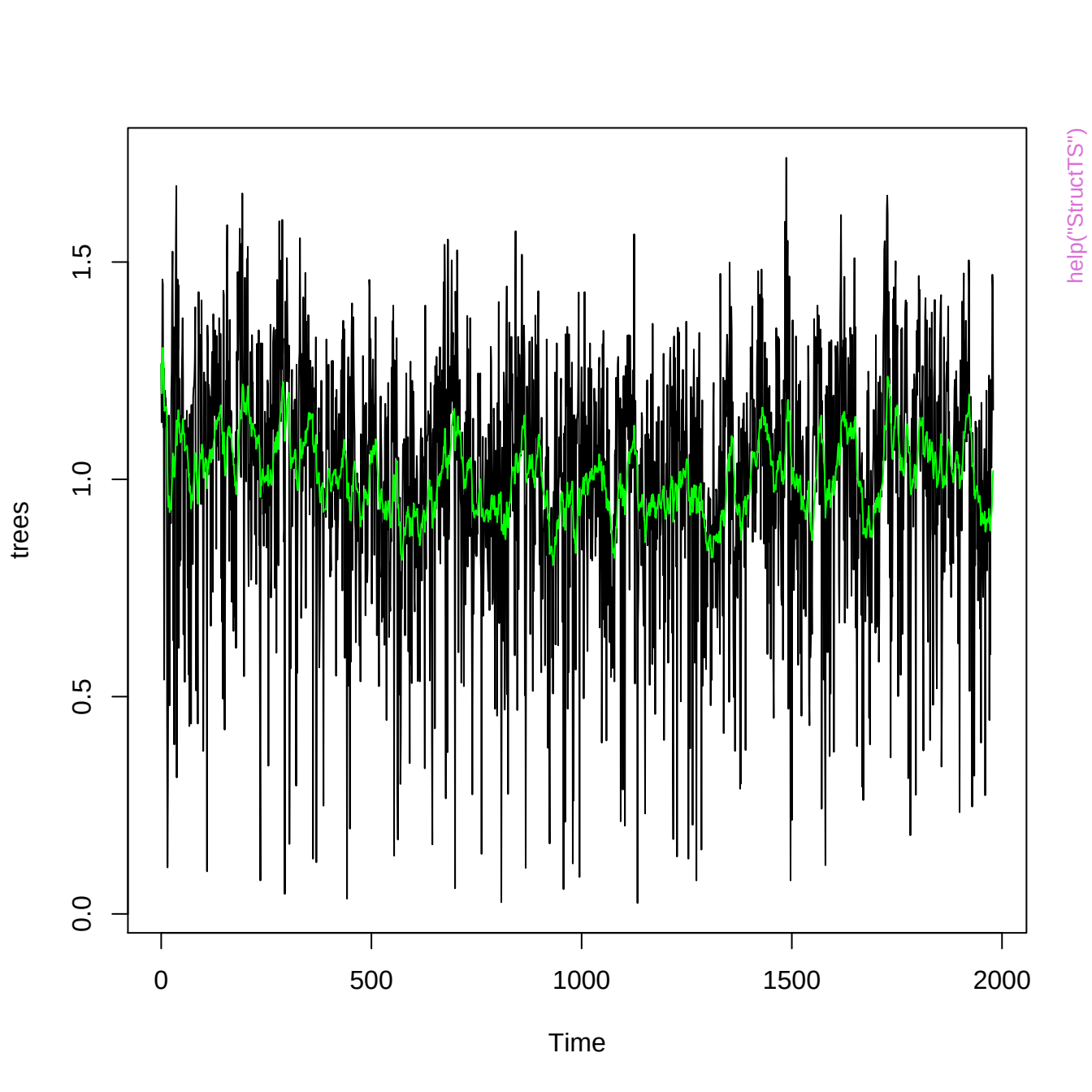


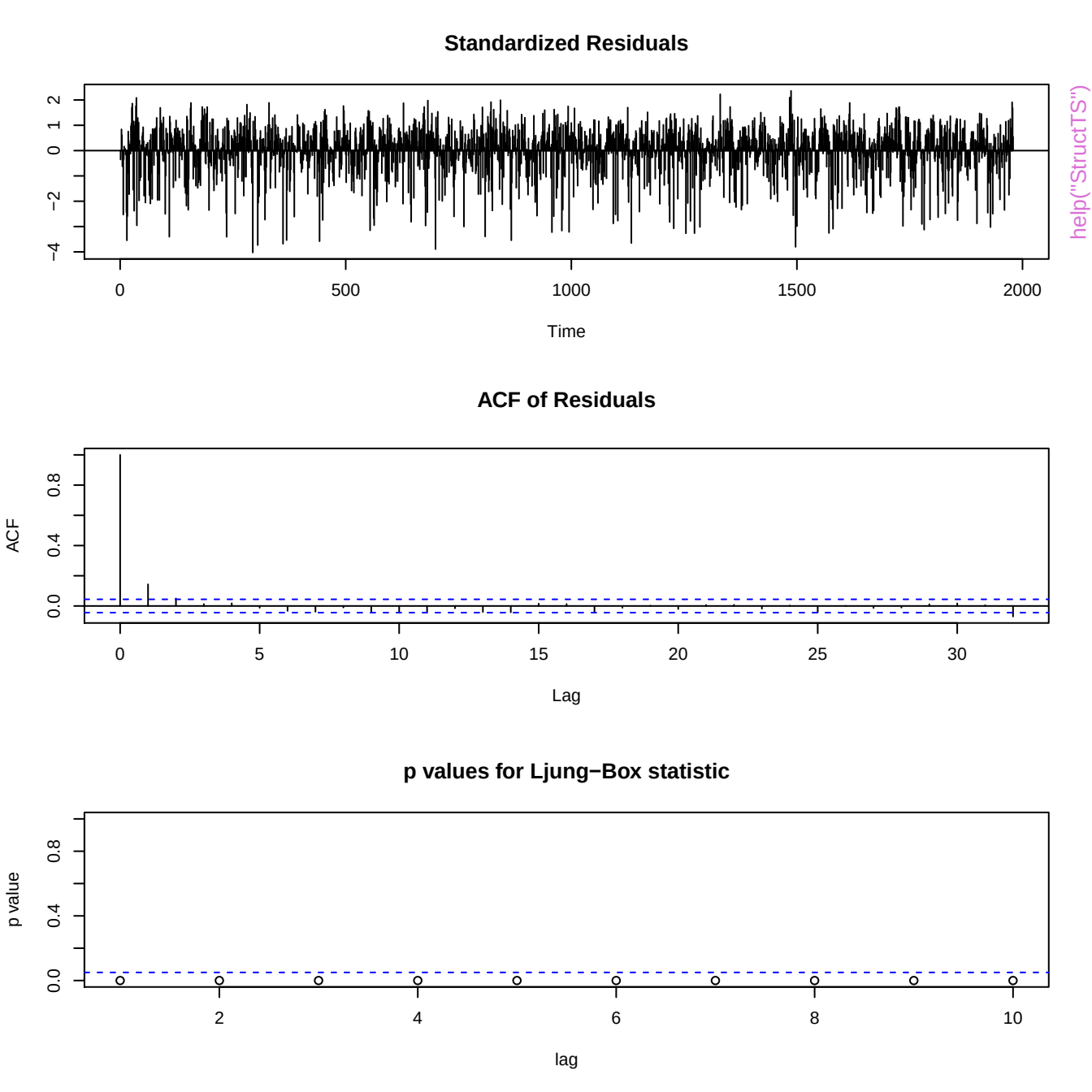


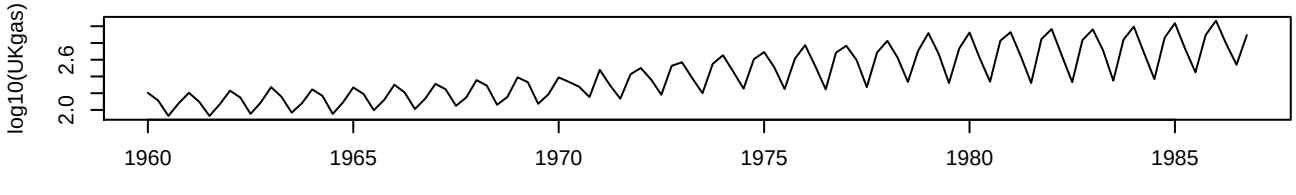




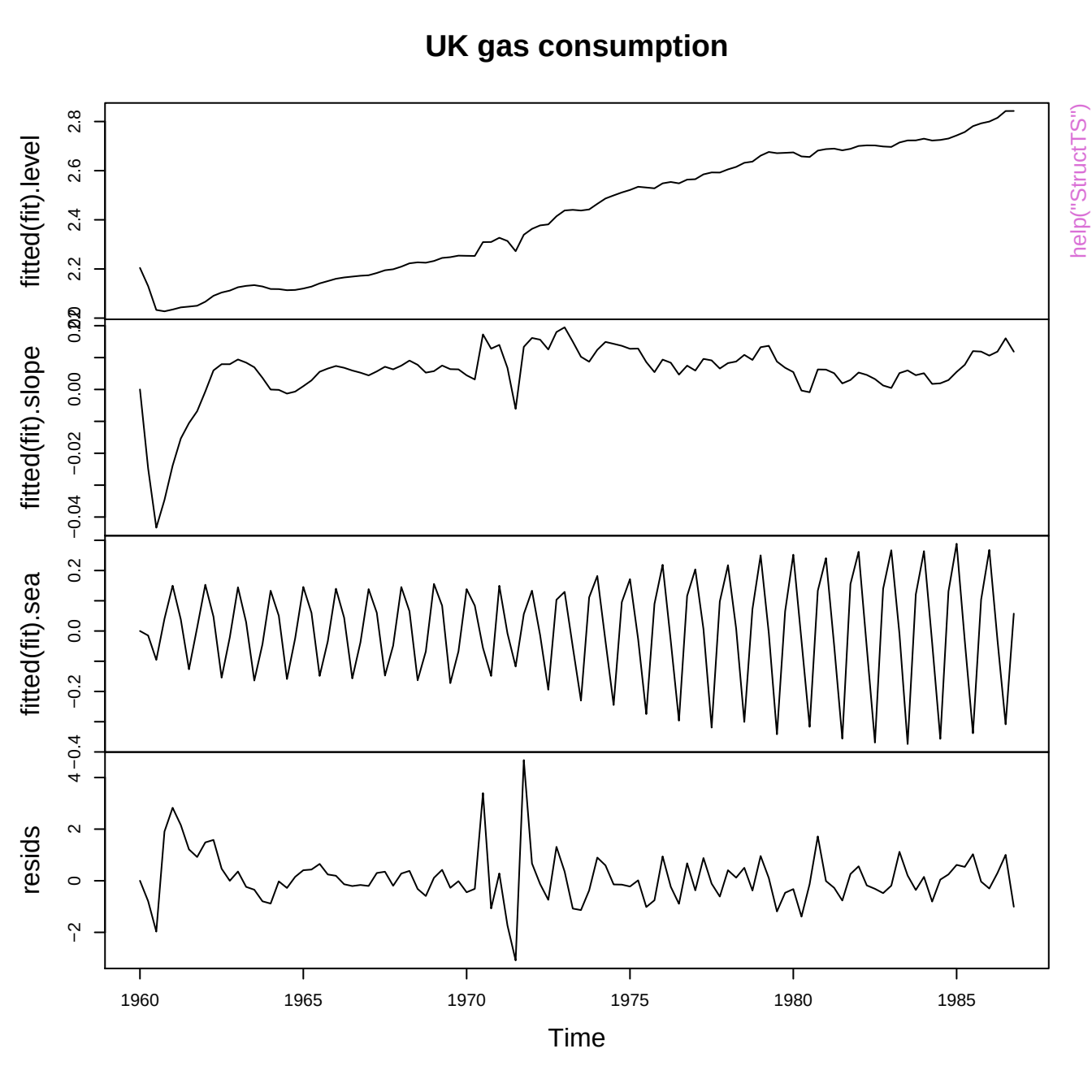
help("SignRank")

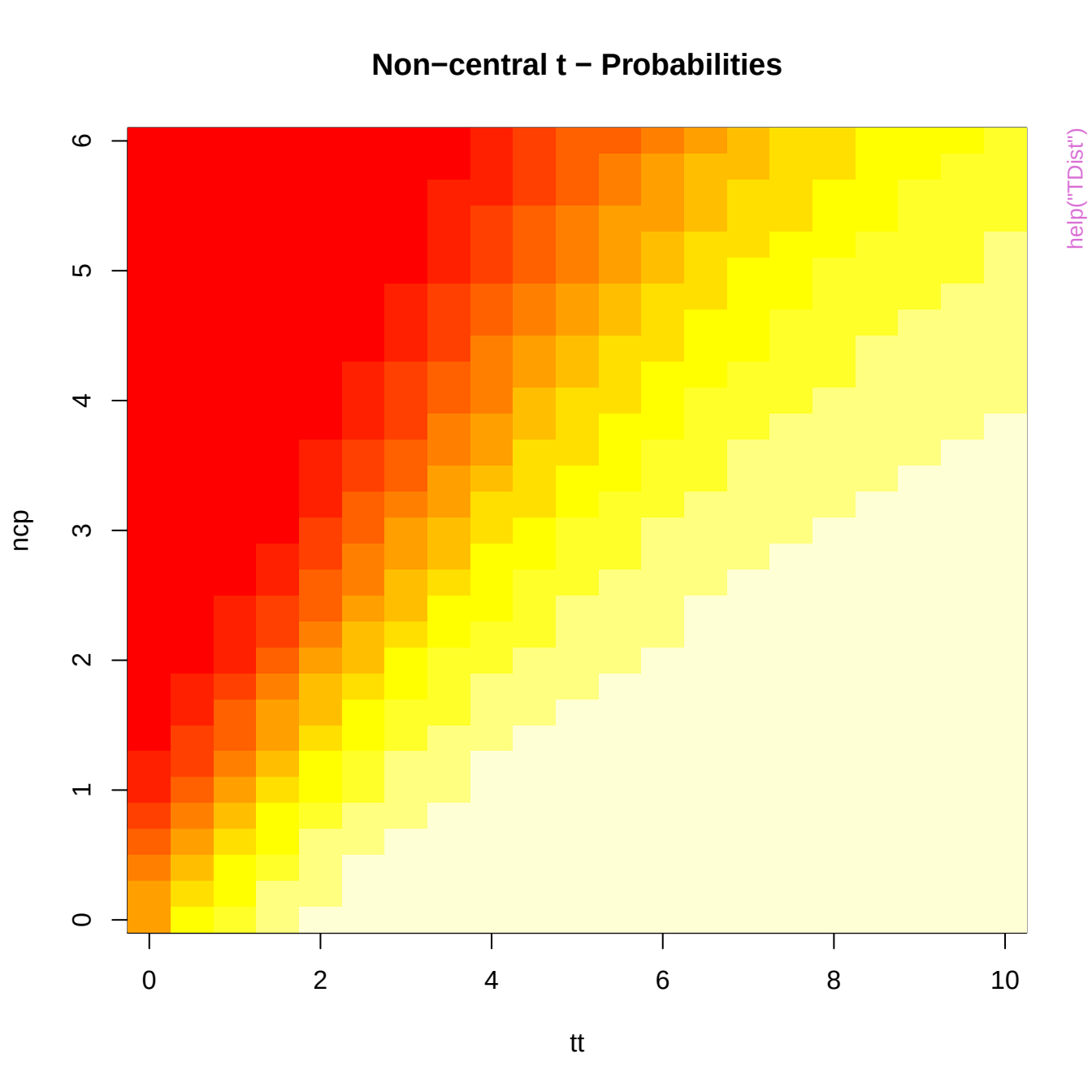

trees
0.0
0.5
1.0
1.5
0
500
1000
1500
2000
Time
help("StructTS")


Standardized Residuals
Time
ACF of Residuals
ACF
Lag
p values for Ljung−Box statistic
p value
lag
help("StructTS")

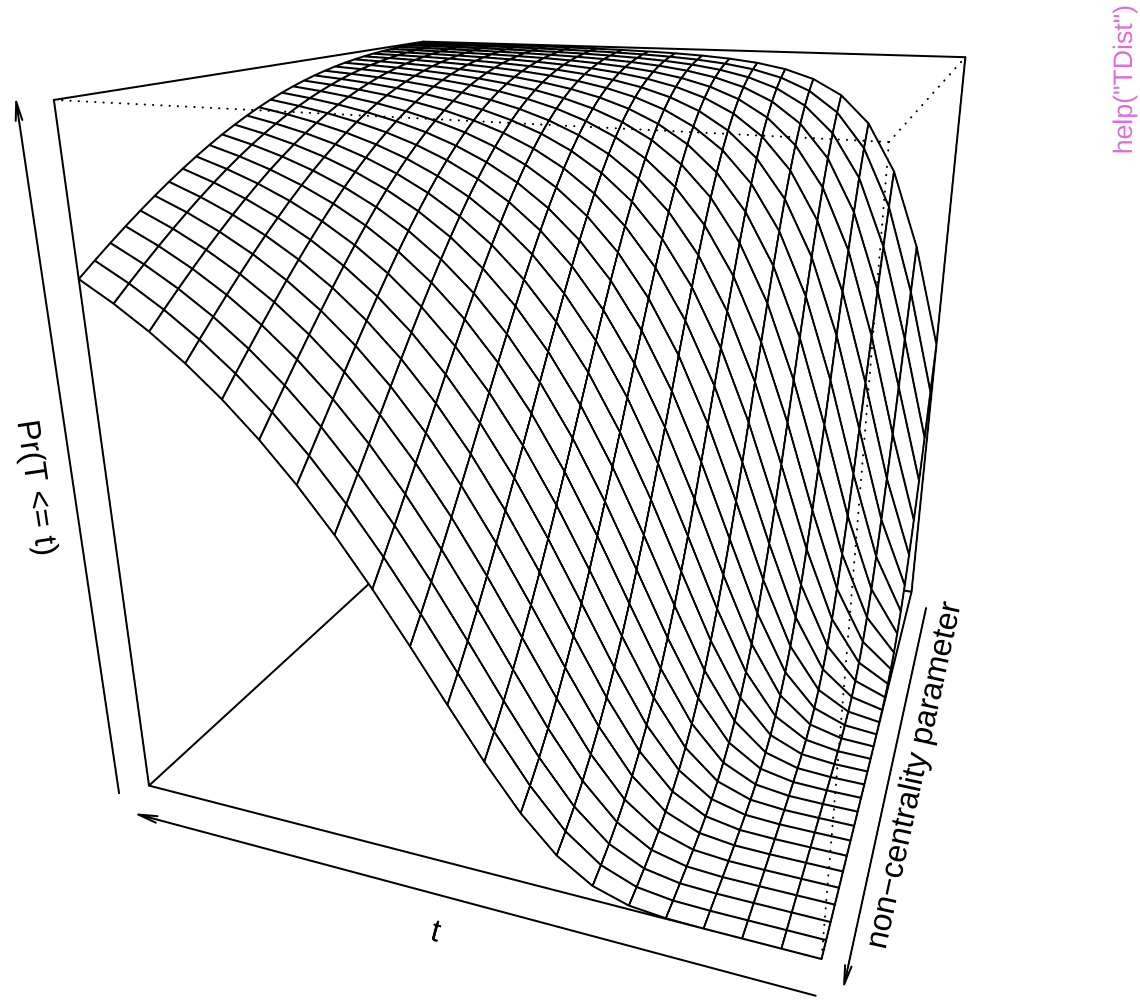


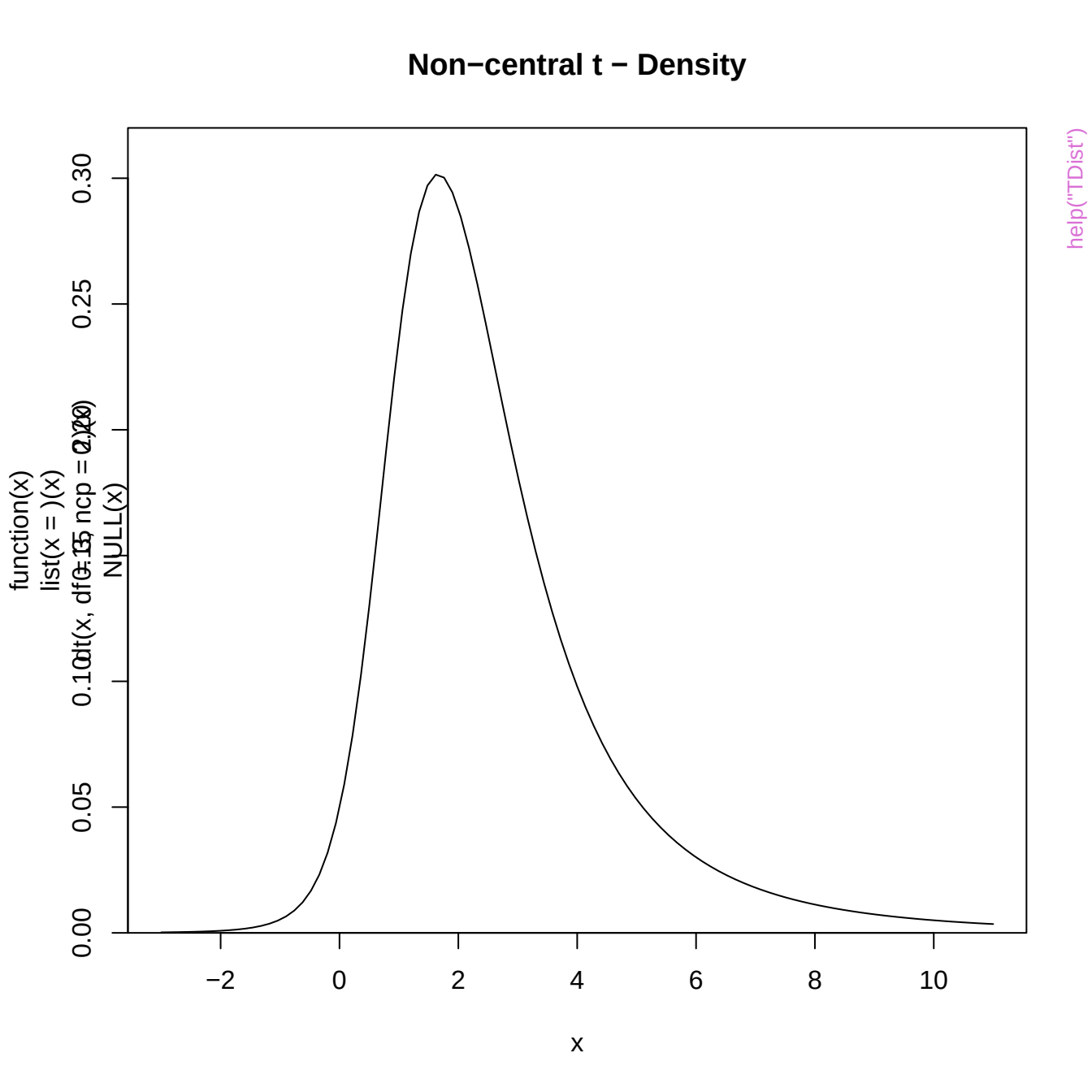
help("StructTS")

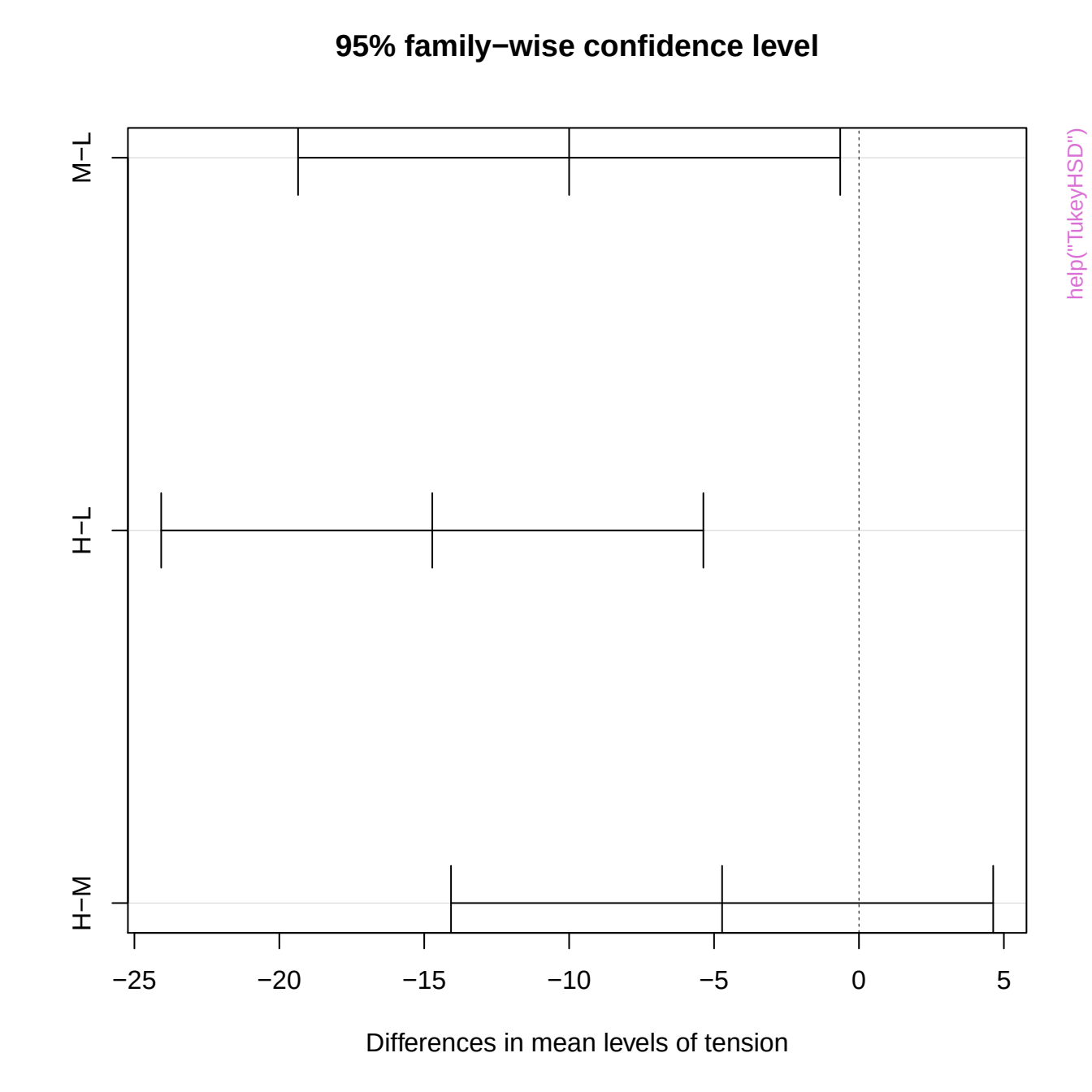

UK gas consumption
fitted(fit).level
fitted(fit).slope
fitted(fit).sea
resids
help("StructTS")
Time
1960
1965
1970
1975
1980
1985

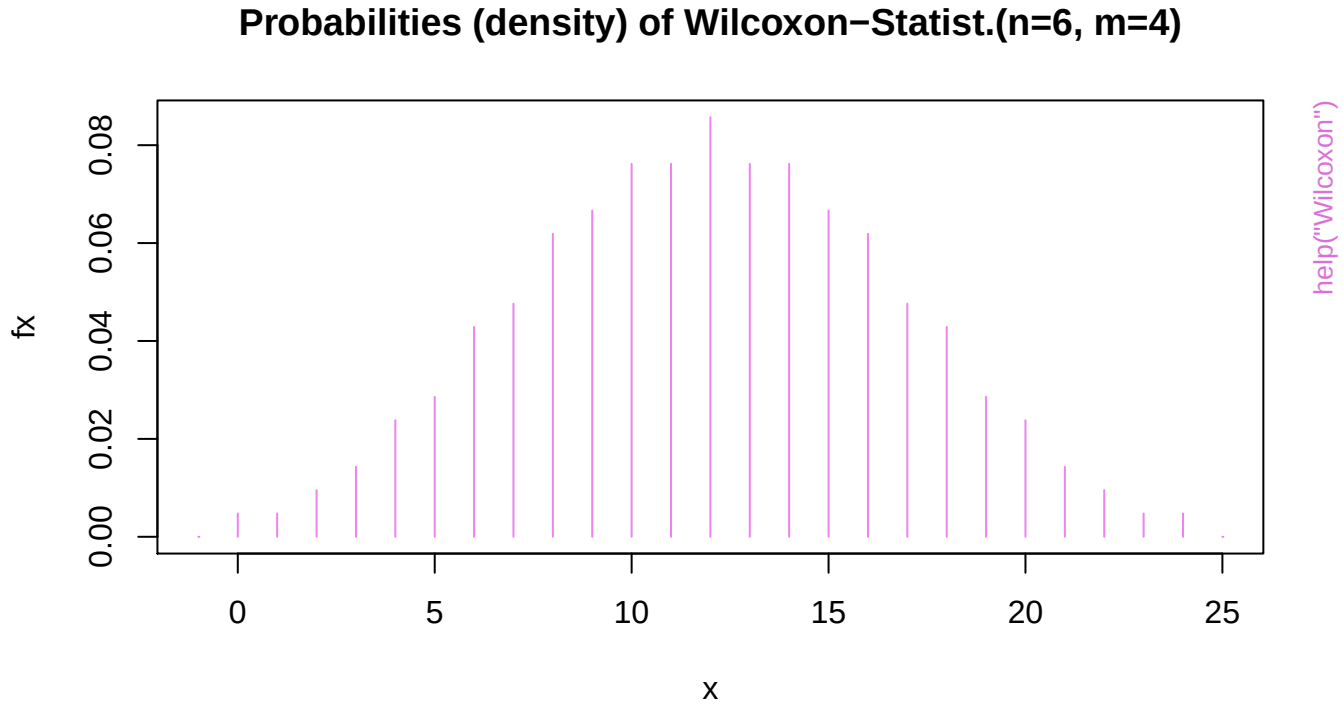

Non−central t − Probabilities
ncp
0
1
2
3
4
5
6
tt
0
2
4
6
8
10
help("TDist")

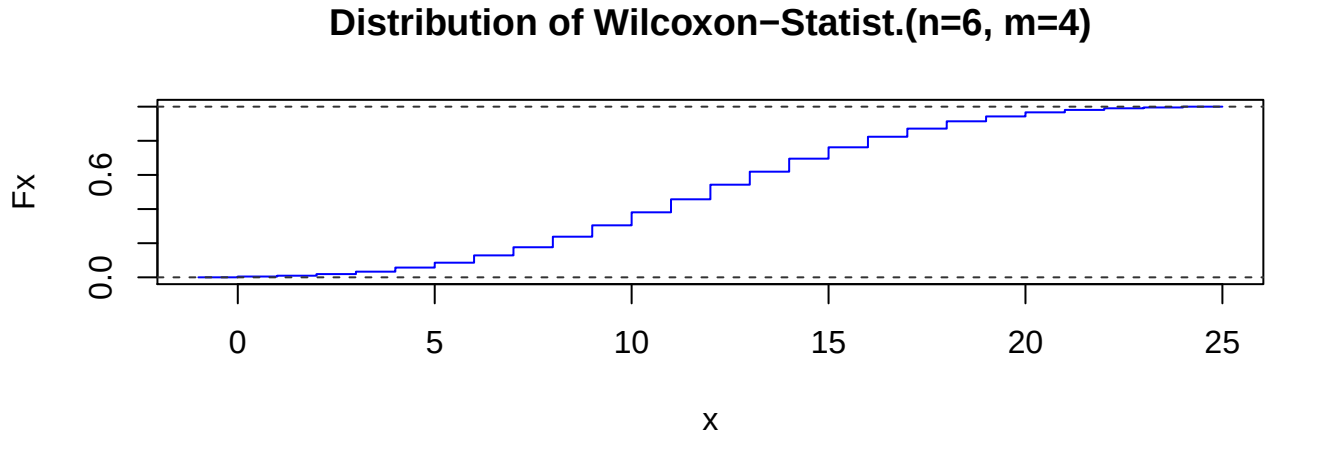
Non−central t − Probabilities

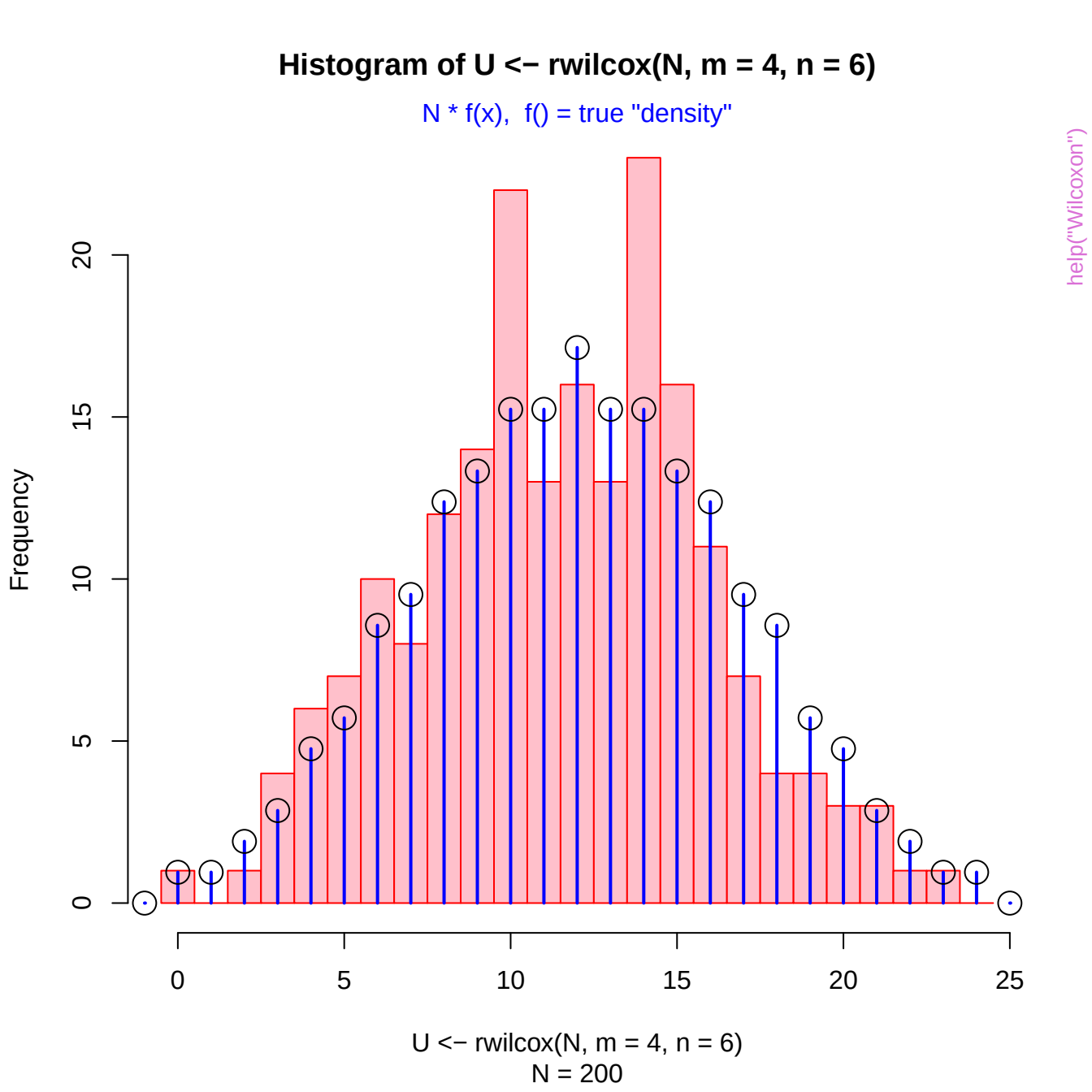


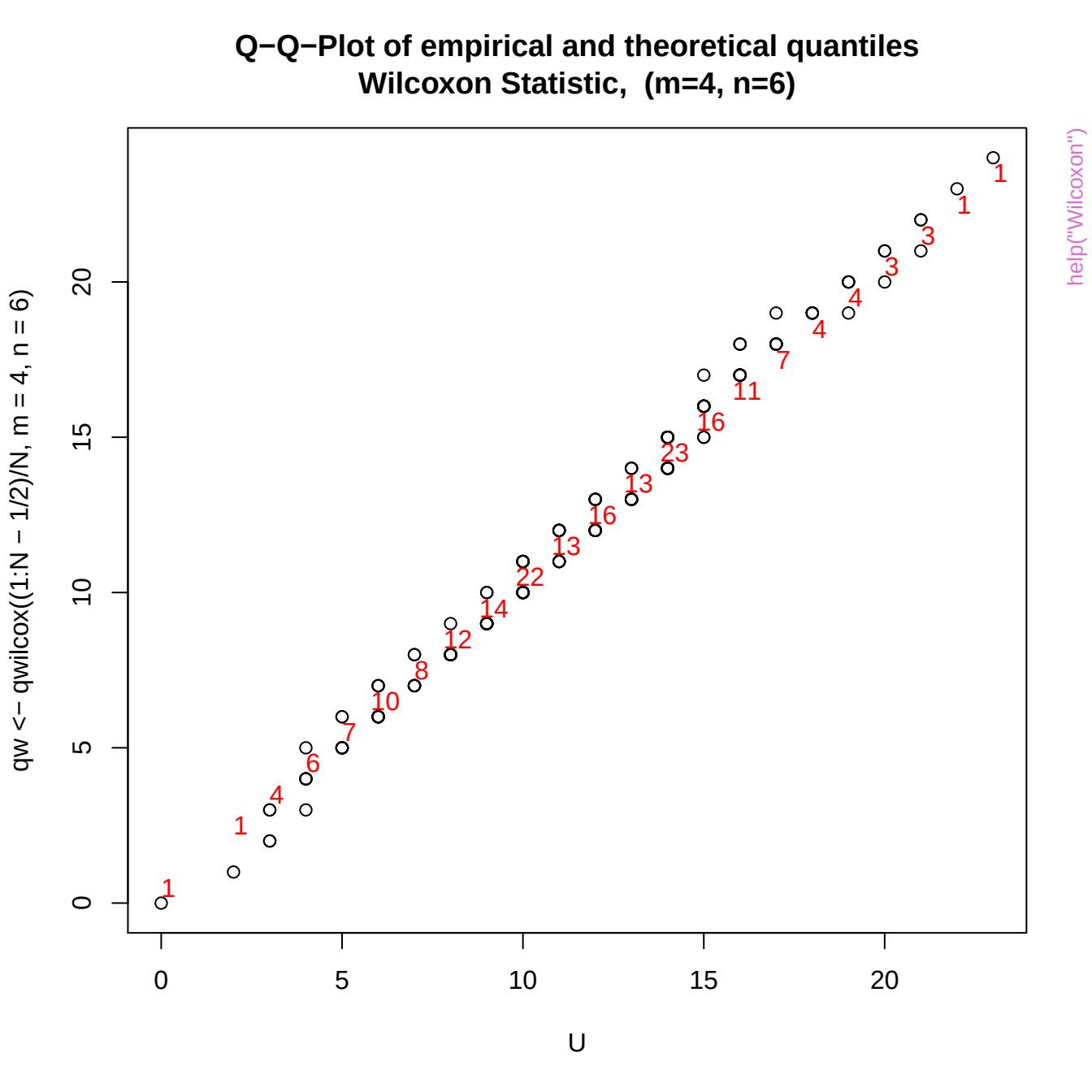

Non−central t − Density
function(x)
list(x =)(x)
lt(x, df = 5, ncp = 2.2)
NULL(x)
help("TDist")
0.00
0.05
0.10
0.15
0.20
0.25
0.30
−2
0
2
4
6
8
10
x

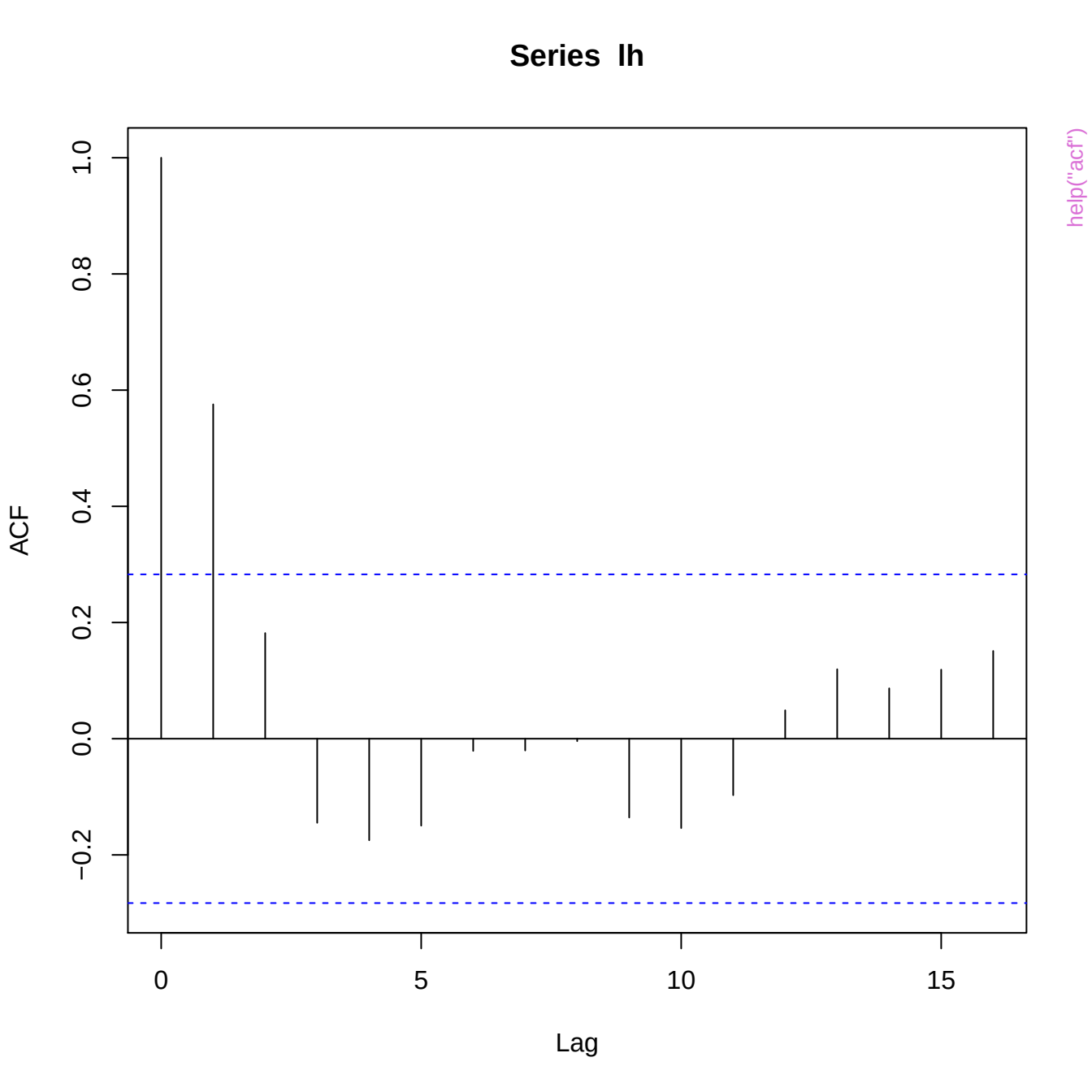

95% family−wise confidence level
M−L
H−L
H−M
−25
−20
−15
−10
−5
0
5
Differences in mean levels of tension
help("TukeyHSD")

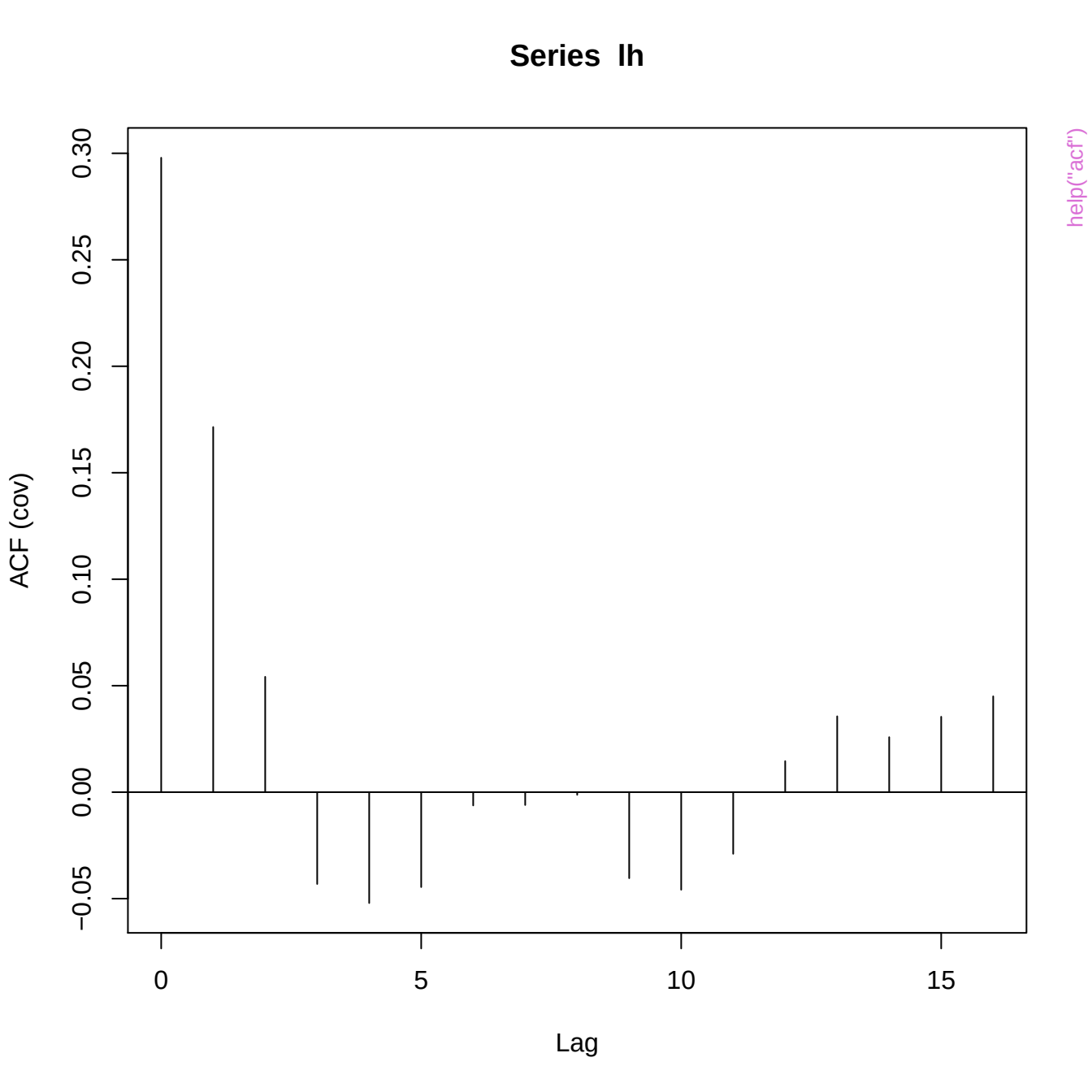

Probabilities (density) of Wilcoxon−Statist.(n=6, m=4)
fx
0.00
0.02
0.04
0.06
0.08
0
5
10
15
20
25
x
help("Wilcoxon")

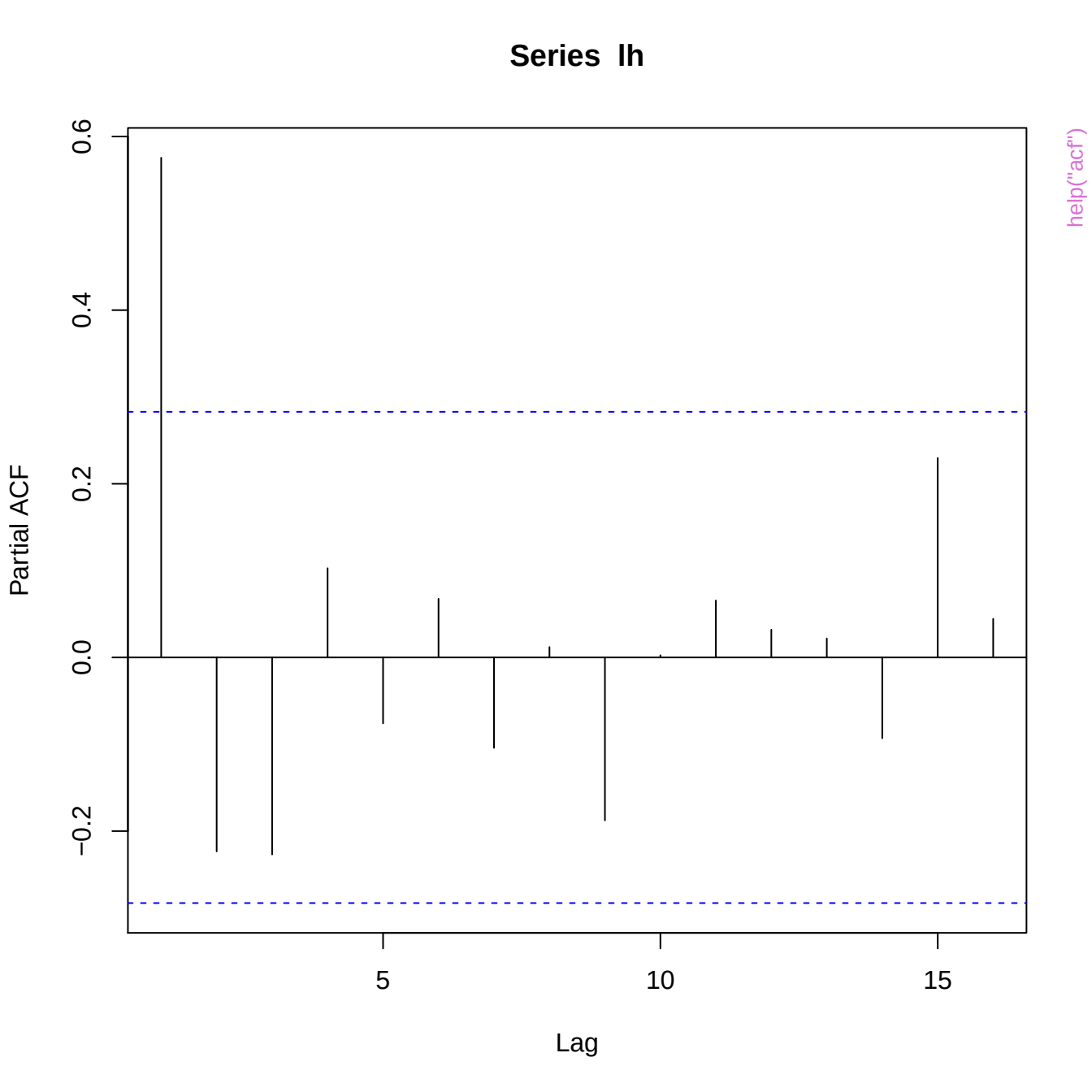

Distribution of Wilcoxon−Statist.(n=6, m=4)
Fx
0.0
0.6
0
5
10
15
20
25
x

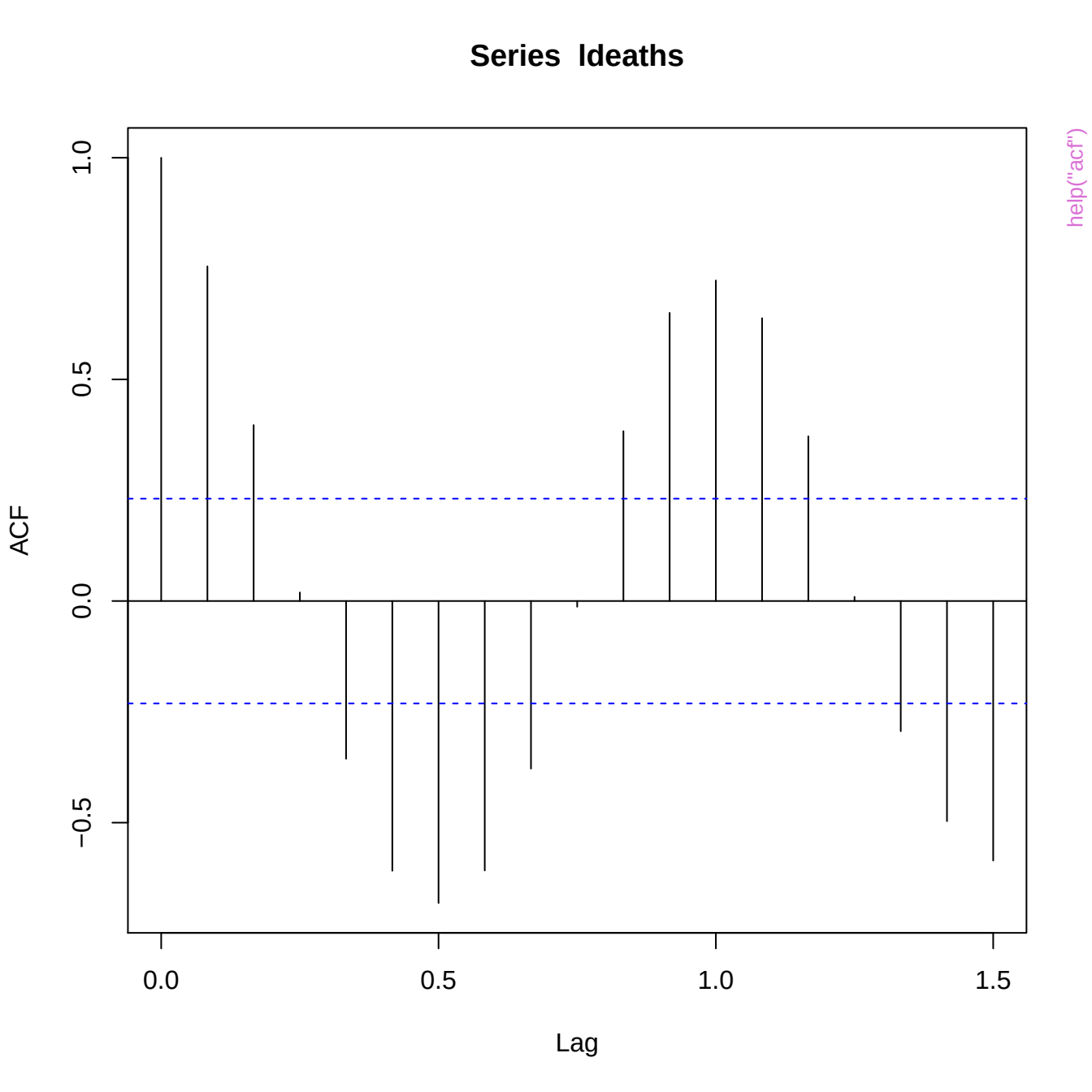

Histogram of U <− rwilcox(N, m = 4, n = 6)
N * f(x), f() = true "density"
help("Wilcoxon")
Frequency
0
5
10
15
20
0
5
10
15
20
25
U <− rwilcox(N, m = 4, n = 6)
N = 200

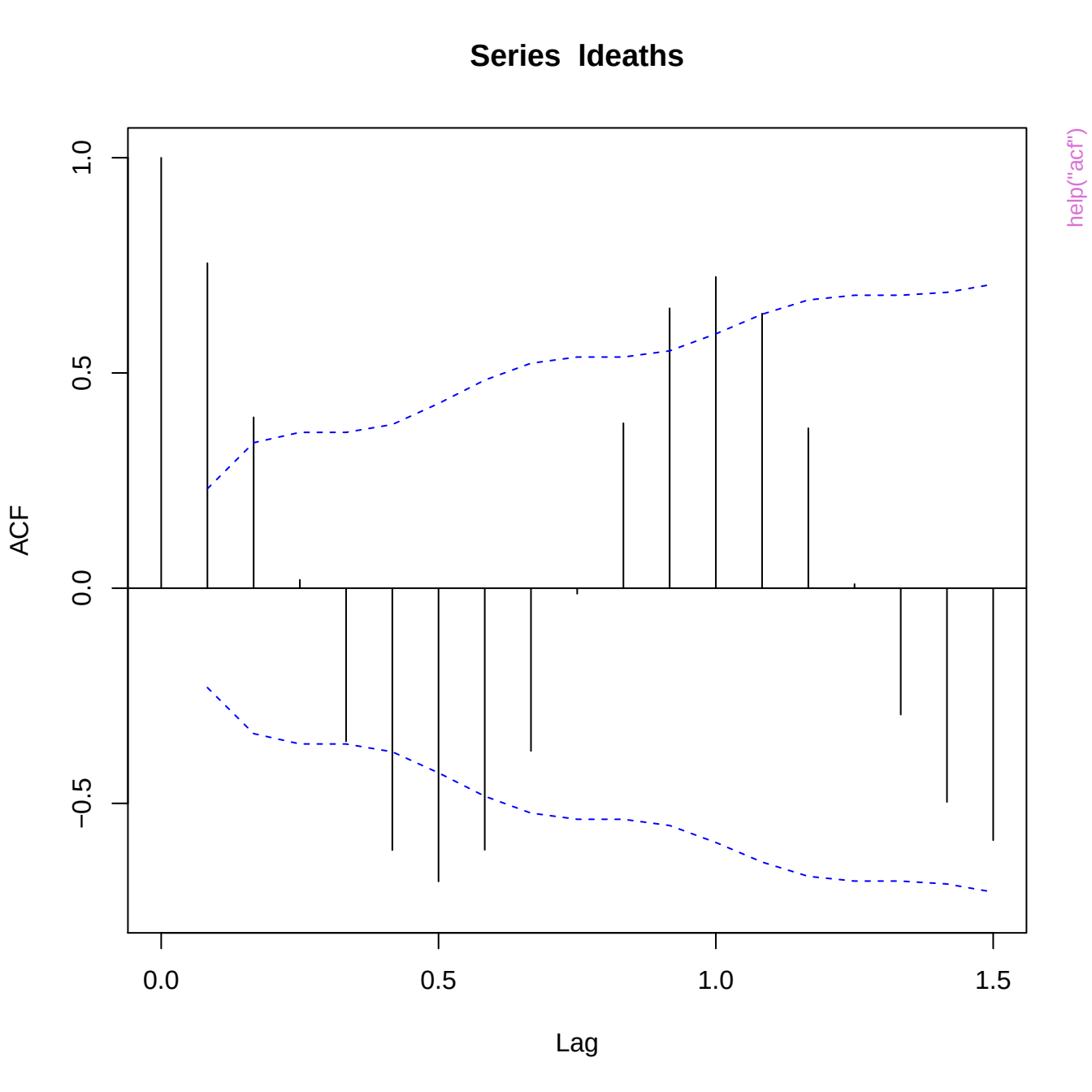

Q−Q−Plot of empirical and theoretical quantiles
Wilcoxon Statistic, (m=4, n=6)
qw <− qwilcox((1:N − 1/2)/N, m = 4, n = 6)
U
0
5
10
15
20
help("Wilcoxon")

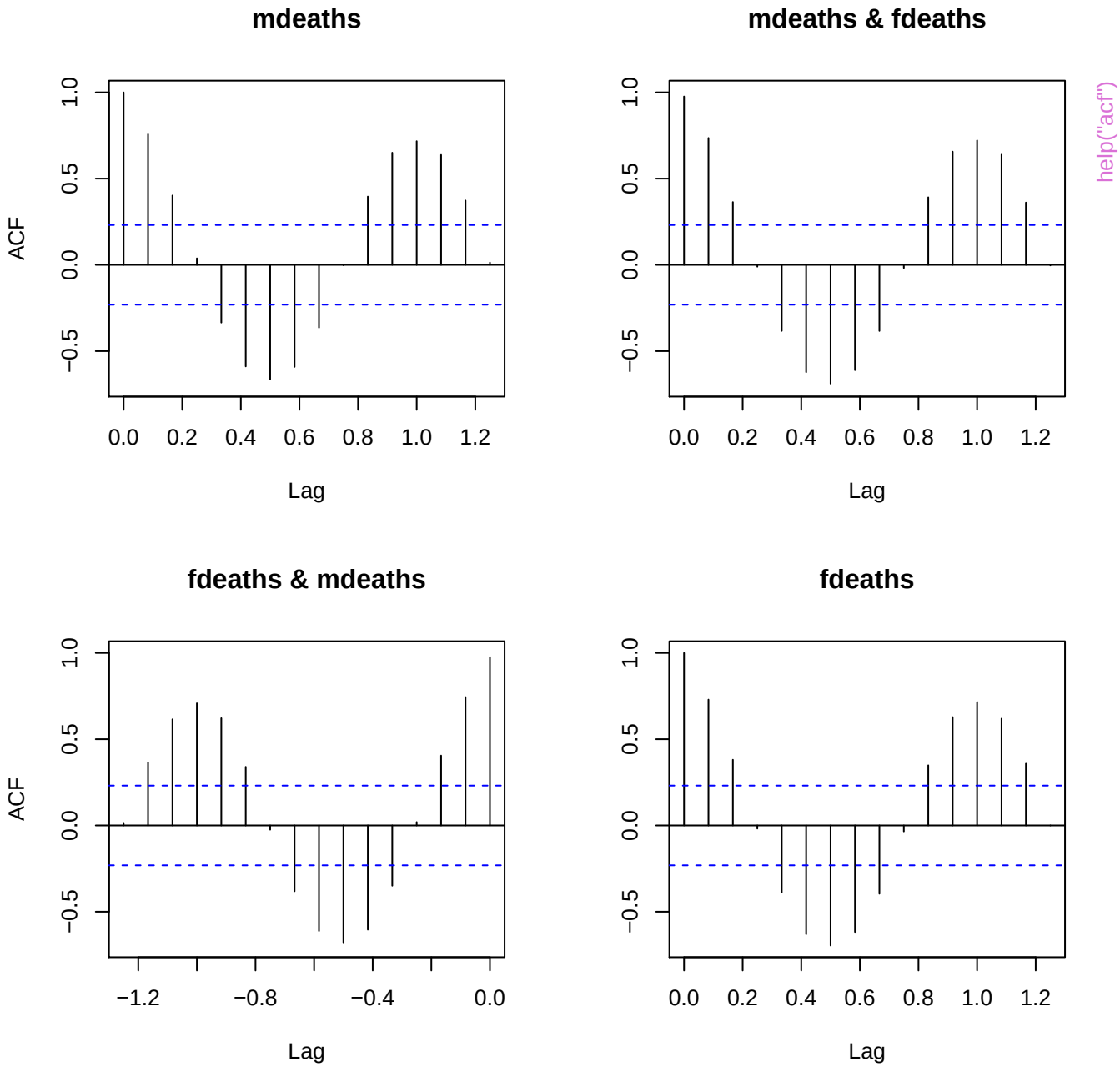

Series lh
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
0
5
10
15
Lag
help("acf")

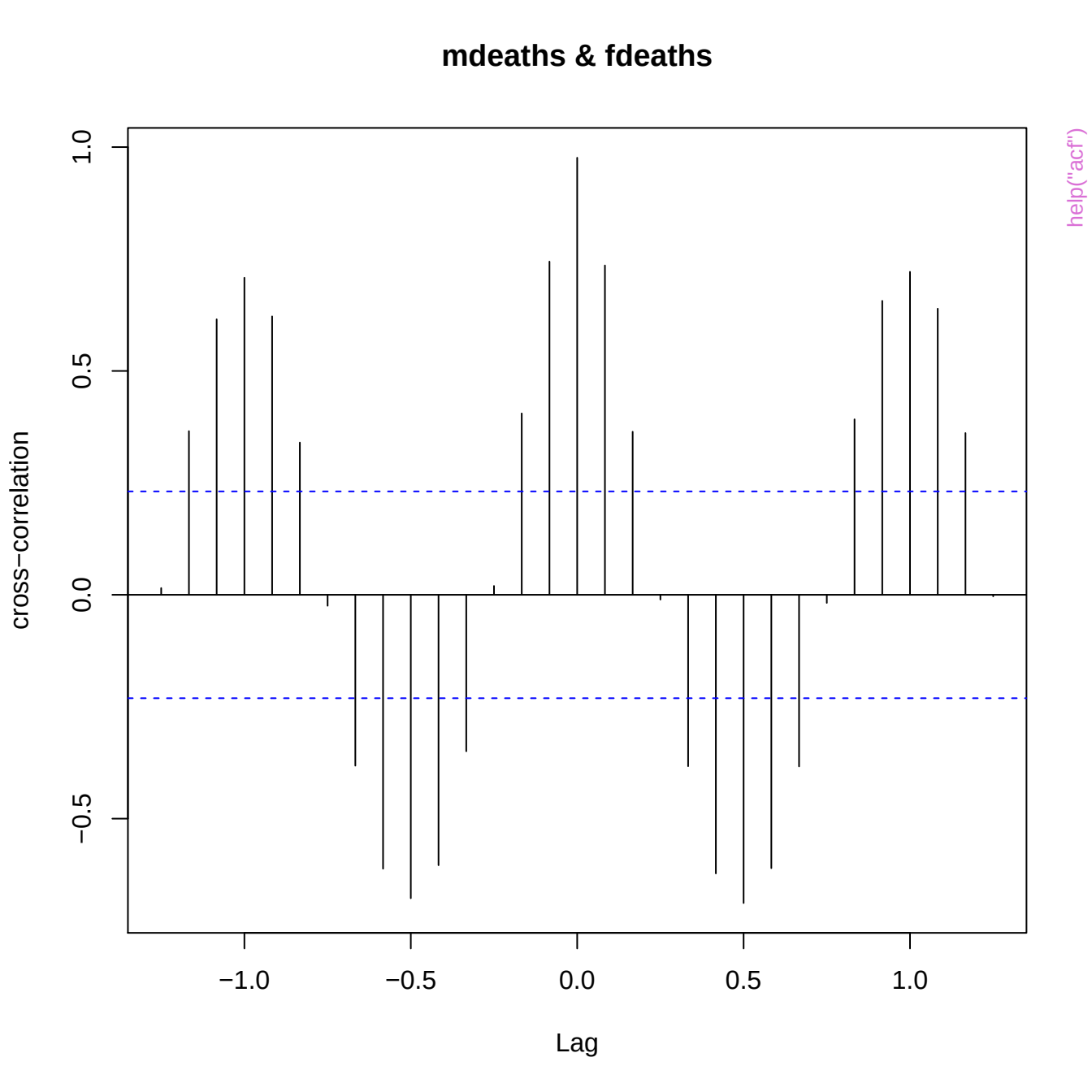

Series lh
ACF (cov)
0.30
0.25
0.20
0.15
0.10
0.05
0.00
−0.05
0
5
10
15
Lag
help("acf")

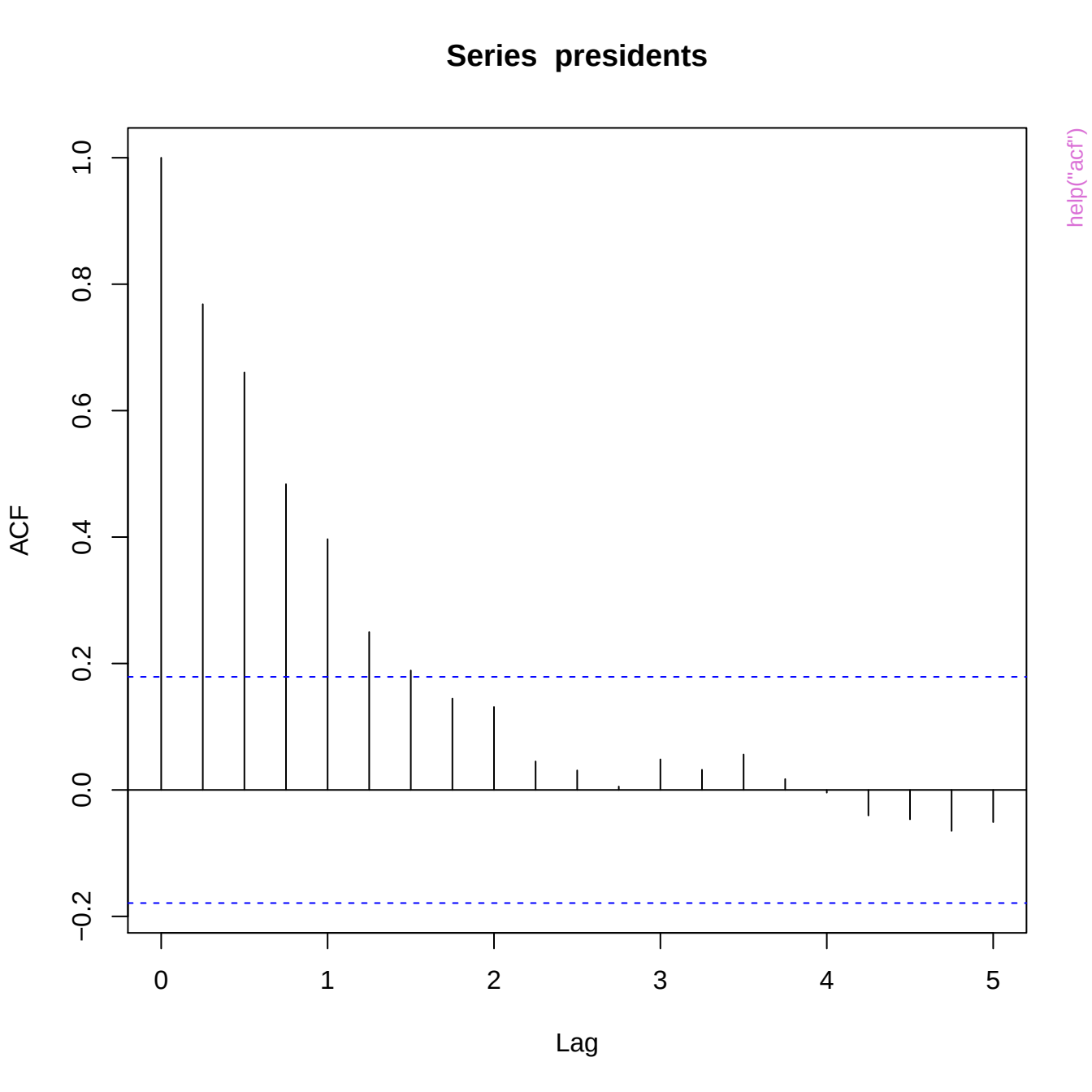

Series lh
Partial ACF
0.6
0.4
0.2
0.0
−0.2
5
10
15
Lag
help("acf")

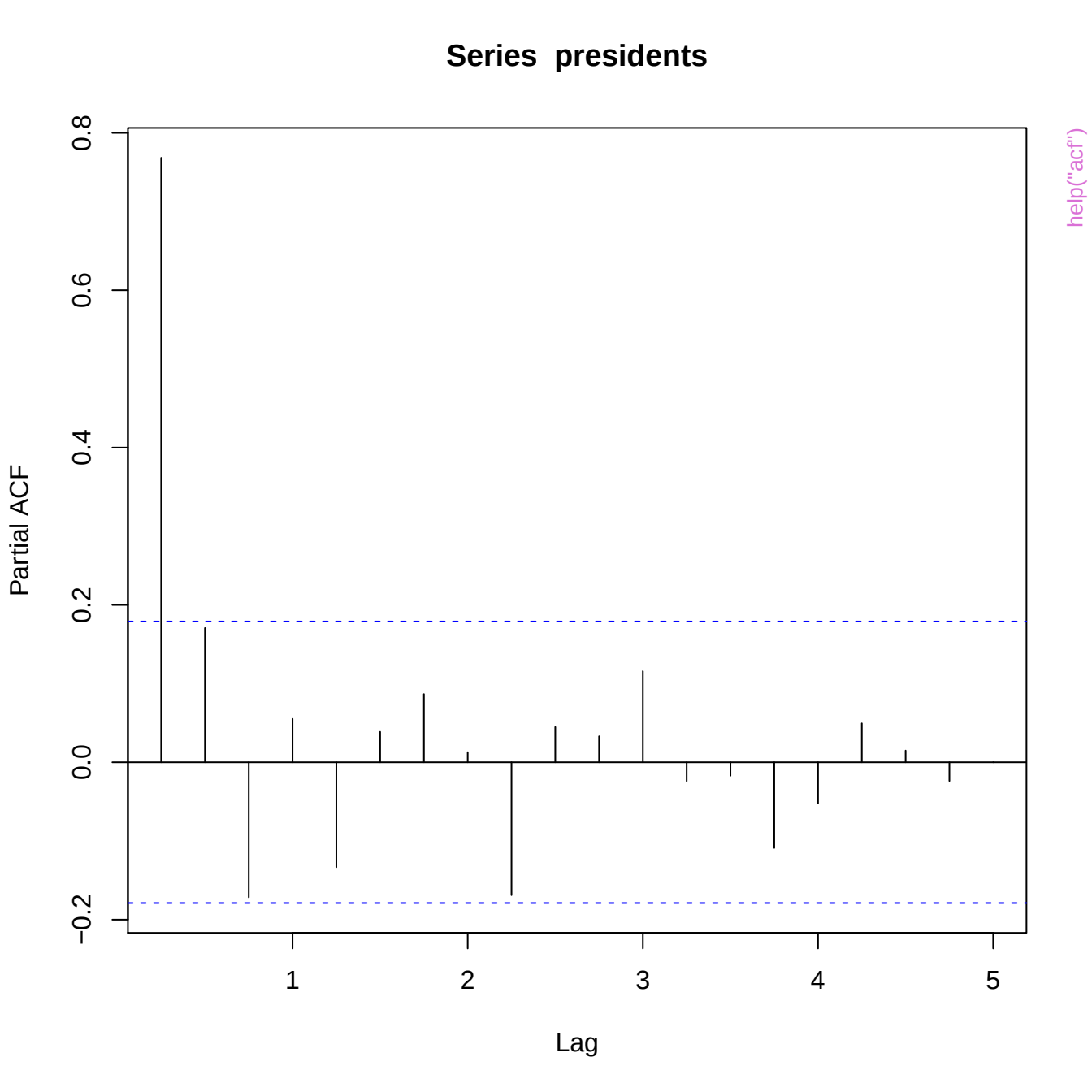

Series Ideaths
ACF
1.0
0.5
0.0
−0.5
0.0
0.5
1.0
1.5
Lag
help("acf")

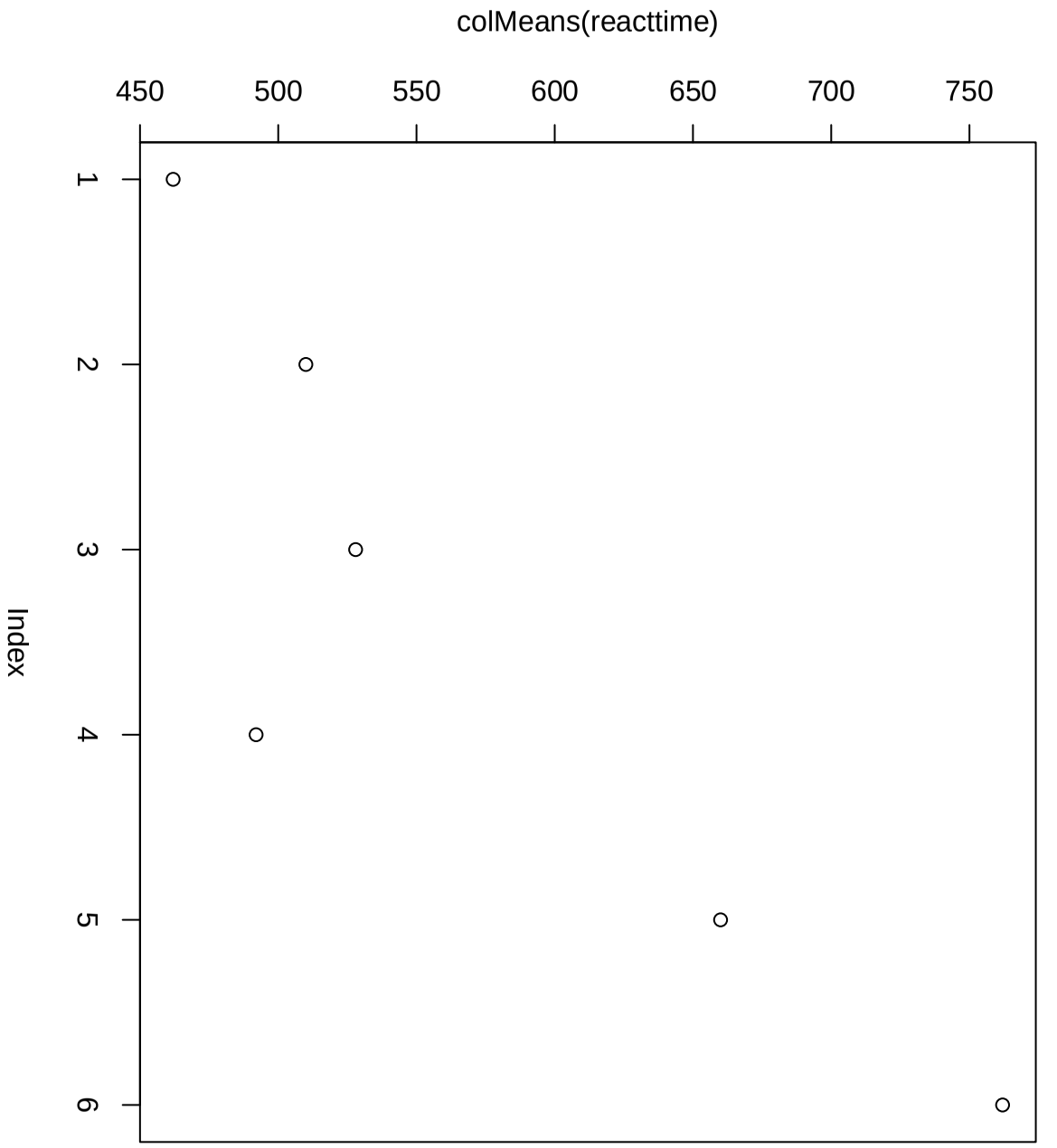

Series Ideaths
ACF
Lag
1.0
0.5
0.0
−0.5
0.0
0.5
1.0
1.5
help("acf")


mdeaths
mdeaths & fdeaths
fdeaths & mdeaths
fdeaths
ACF
Lag
1.0
0.5
0.0
−0.5
0.0
0.2
0.4
0.6
0.8
1.0
1.2
−1.2
−0.8
−0.4
help("acf")

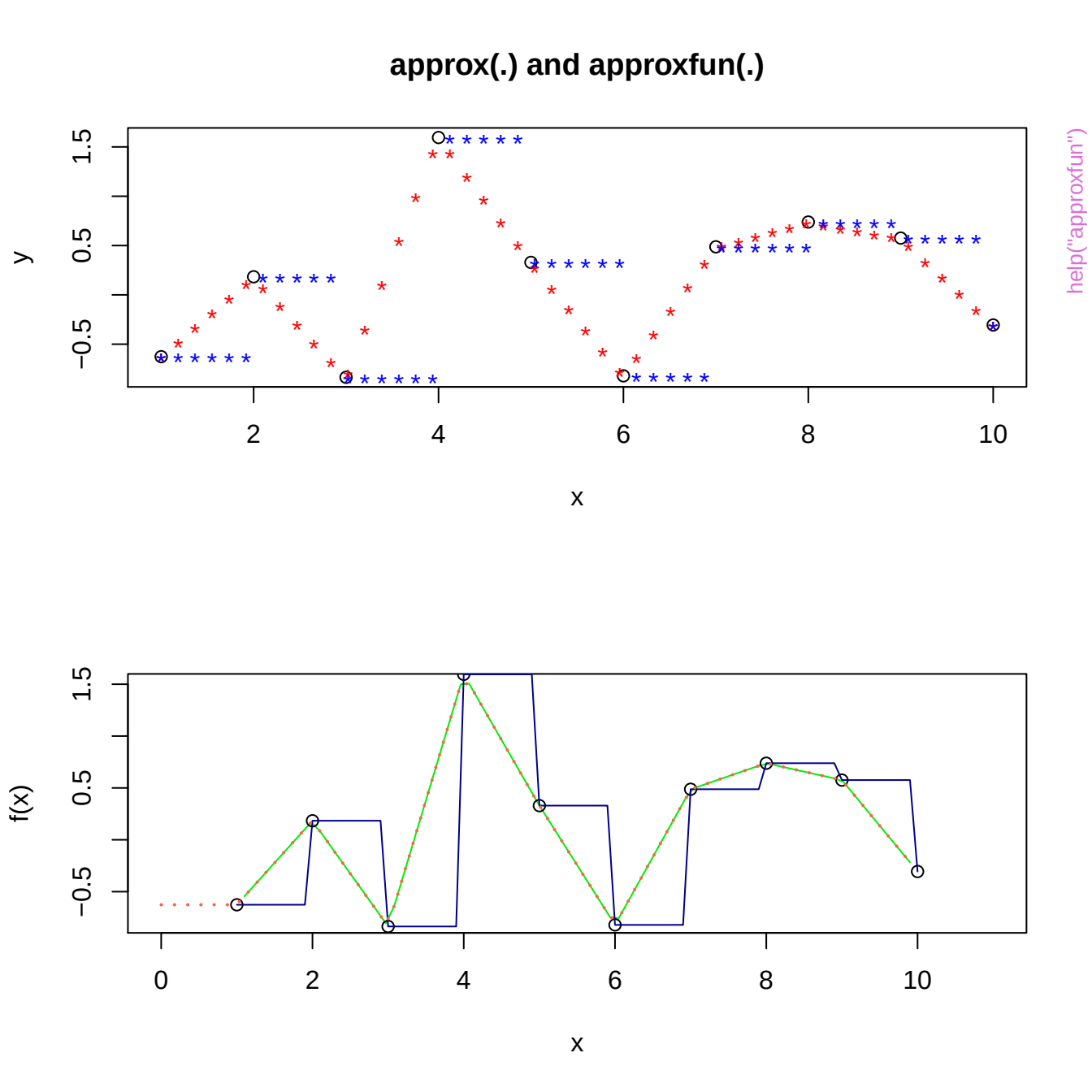

mdeaths & fdeaths
cross−correlation
1.0
0.5
0.0
−0.5
−1.0
−0.5
0.0
0.5
1.0
Lag
help("acf")

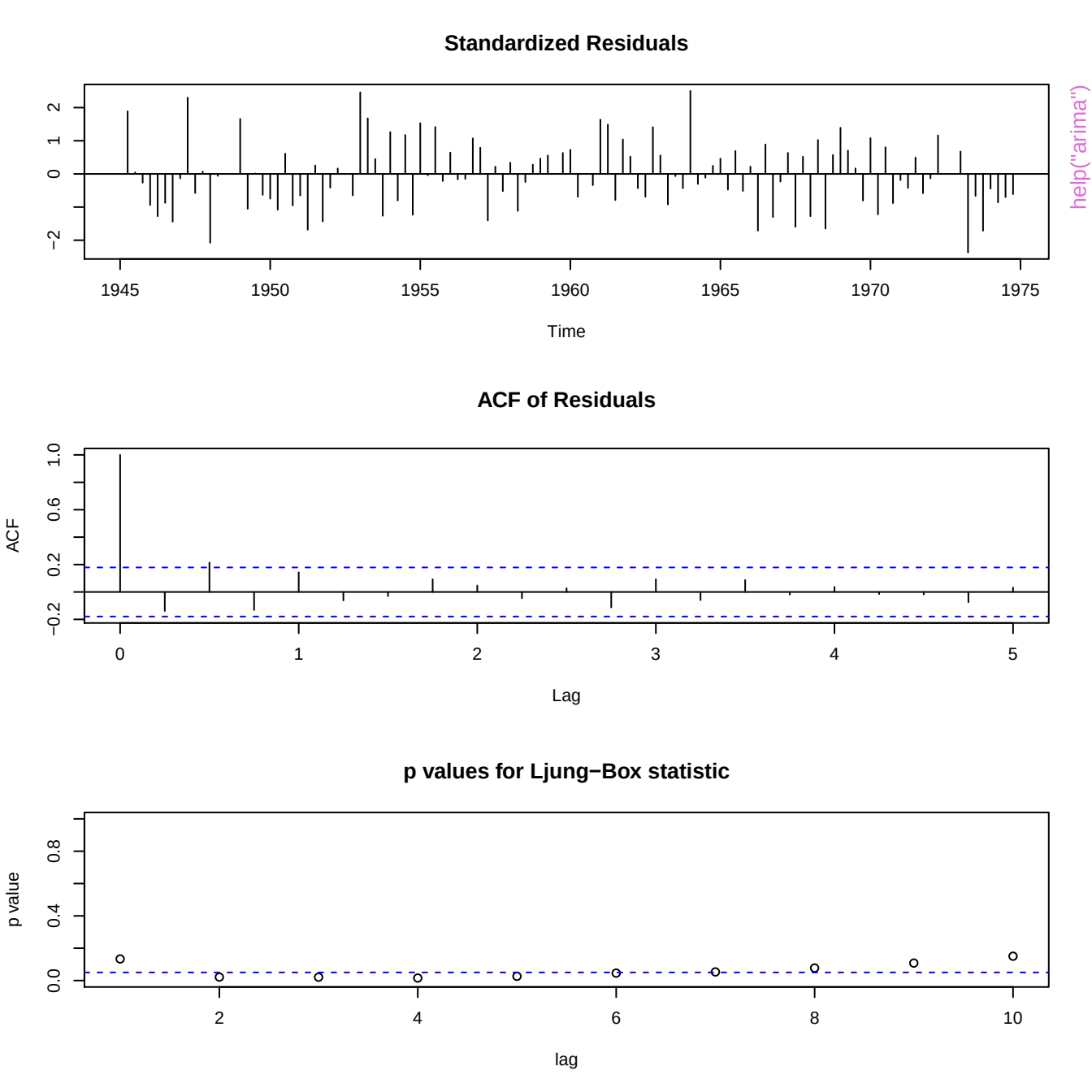

Series presidents
ACF
Lag
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
0
1
2
3
4
5
help("acf")

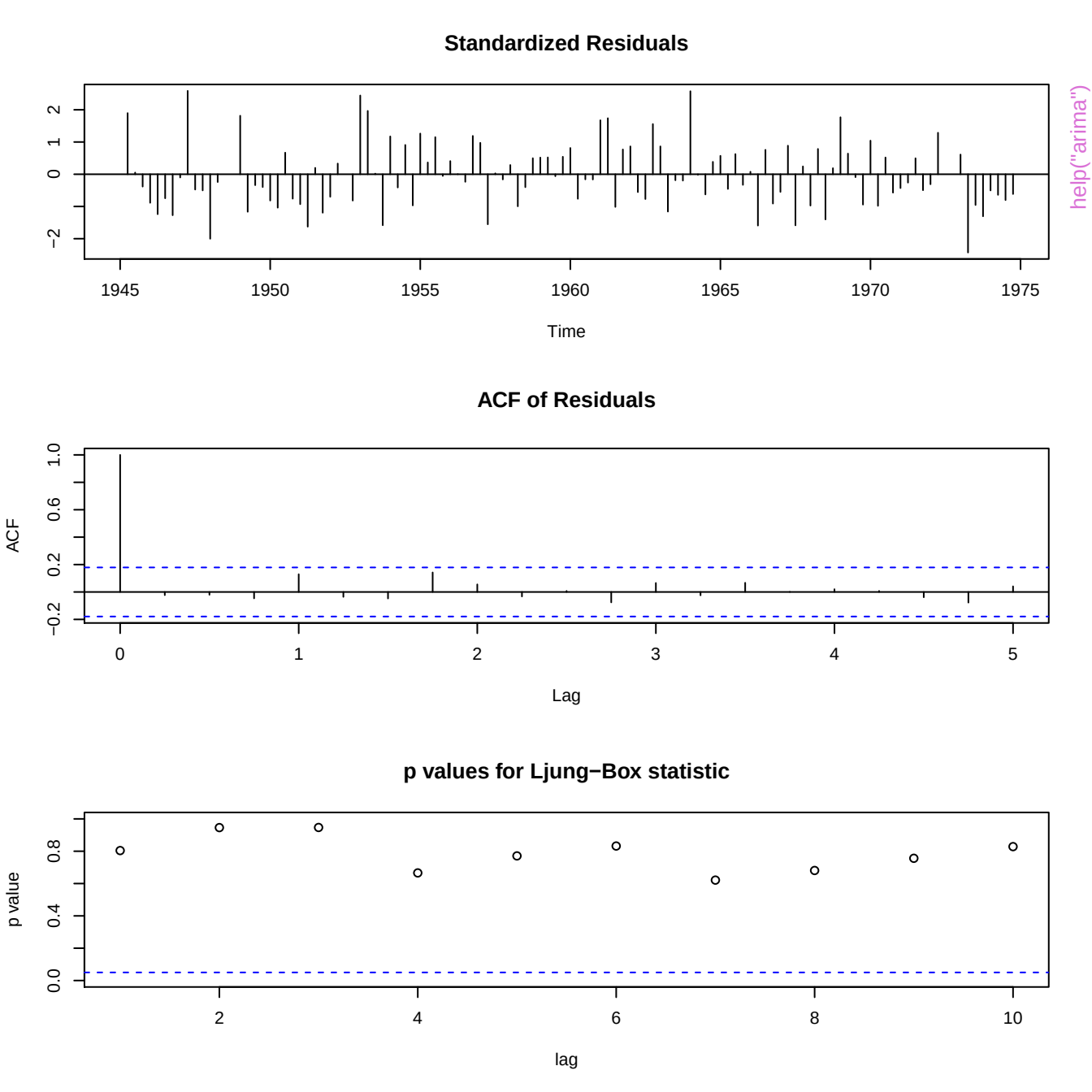

Series presidents
Partial ACF
0.8
0.6
0.4
0.2
0.0
−0.2
1
2
3
4
5
Lag
help("acf")

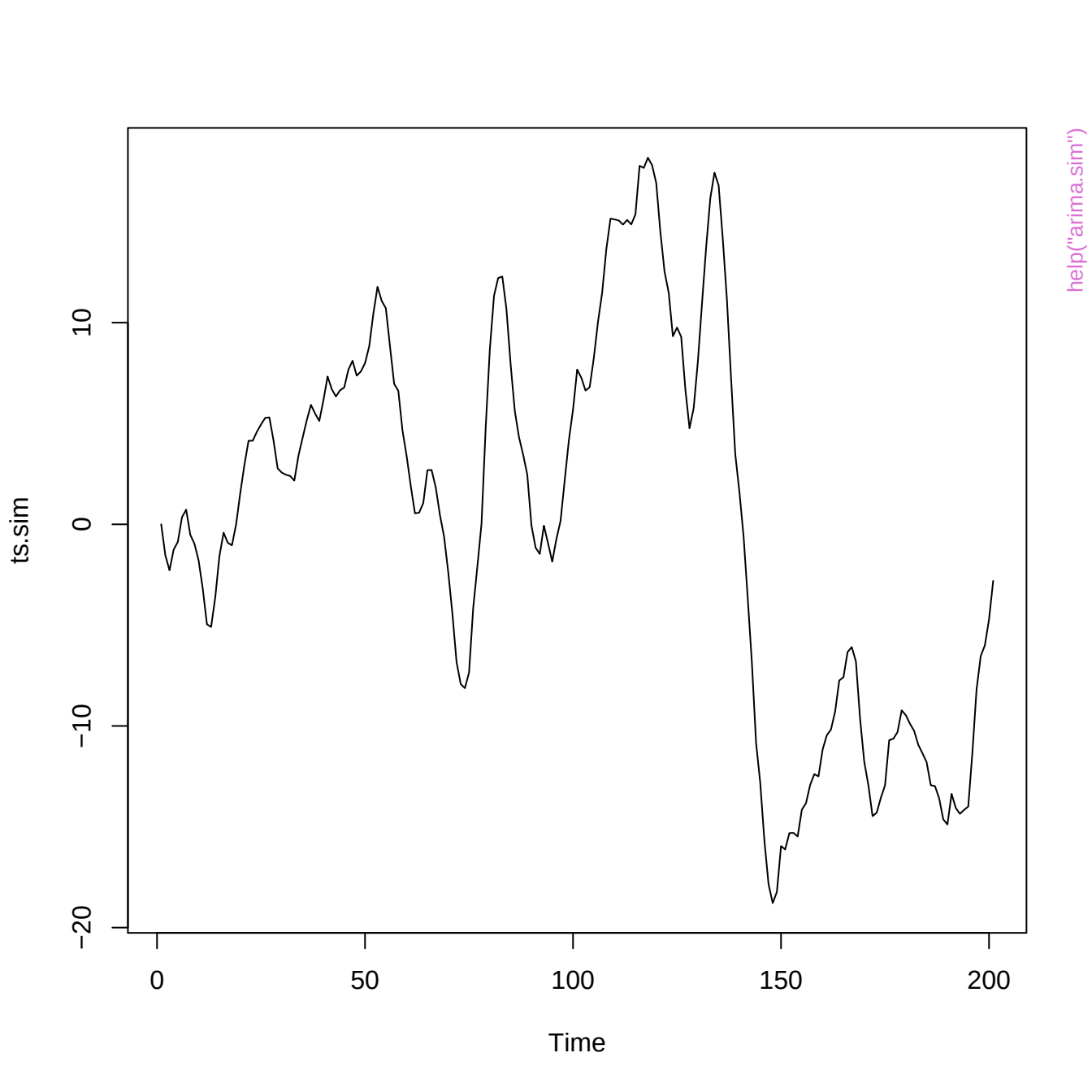


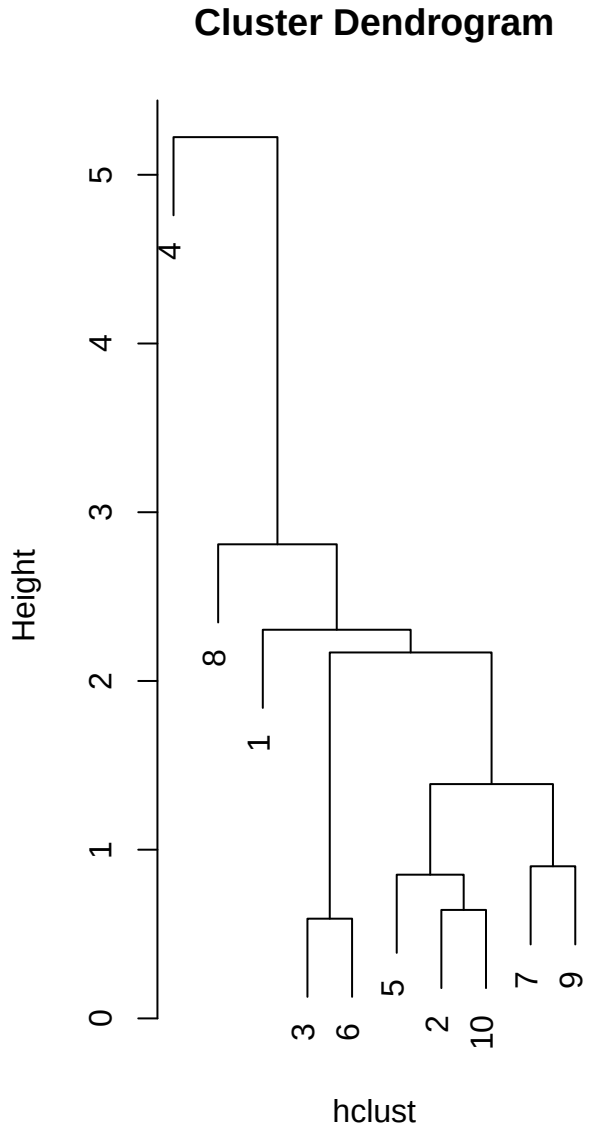
help("anova.mlm")

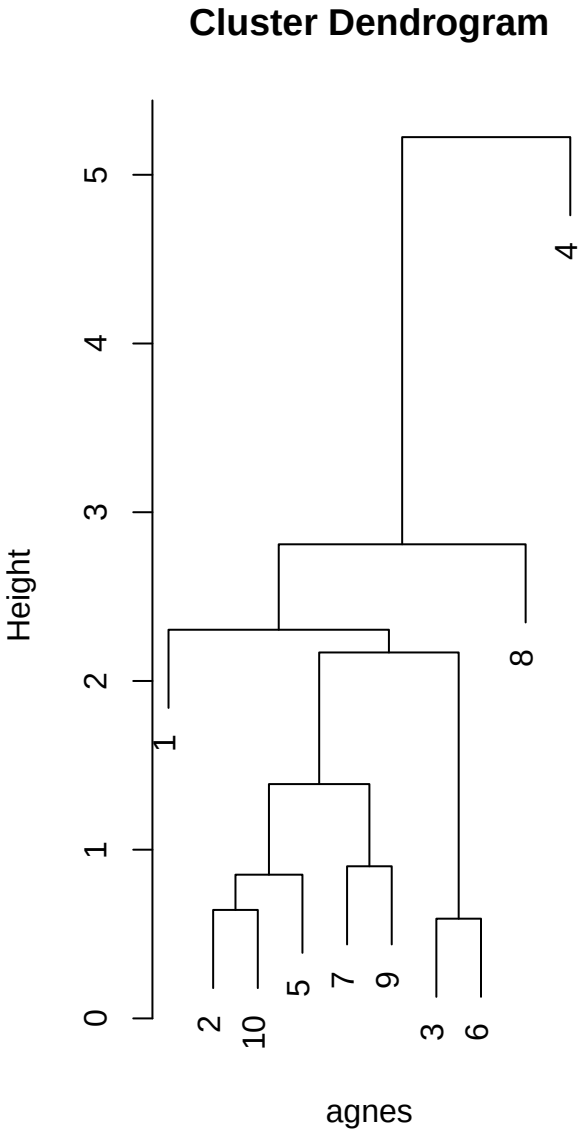

approx(.) and approxfun(.)
y
x
f(x)
help("approxfun")


Standardized Residuals
Time
ACF of Residuals
ACF
Lag
p values for Ljung−Box statistic
p value
lag
help("arima")

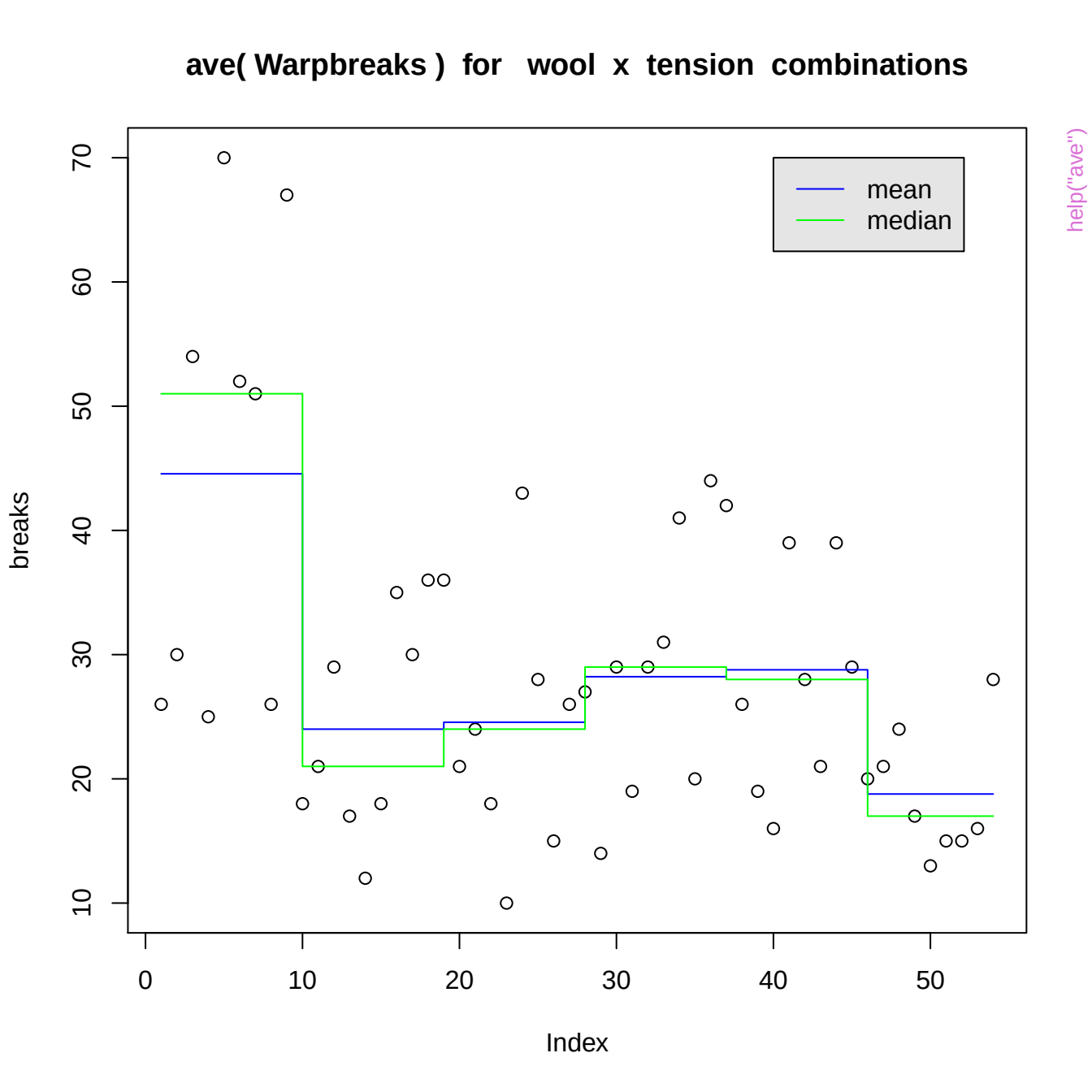

Standardized Residuals
help("arima")
−2
0
1
2
1945
1950
1955
1960
1965
1970
1975
Time
ACF of Residuals
ACF
−0.2
0.2
0.6
1.0
0
1
2
3
4
5
Lag
p values for Ljung−Box statistic
p value
0.0
0.4
0.8
2
4
6
8
10
lag

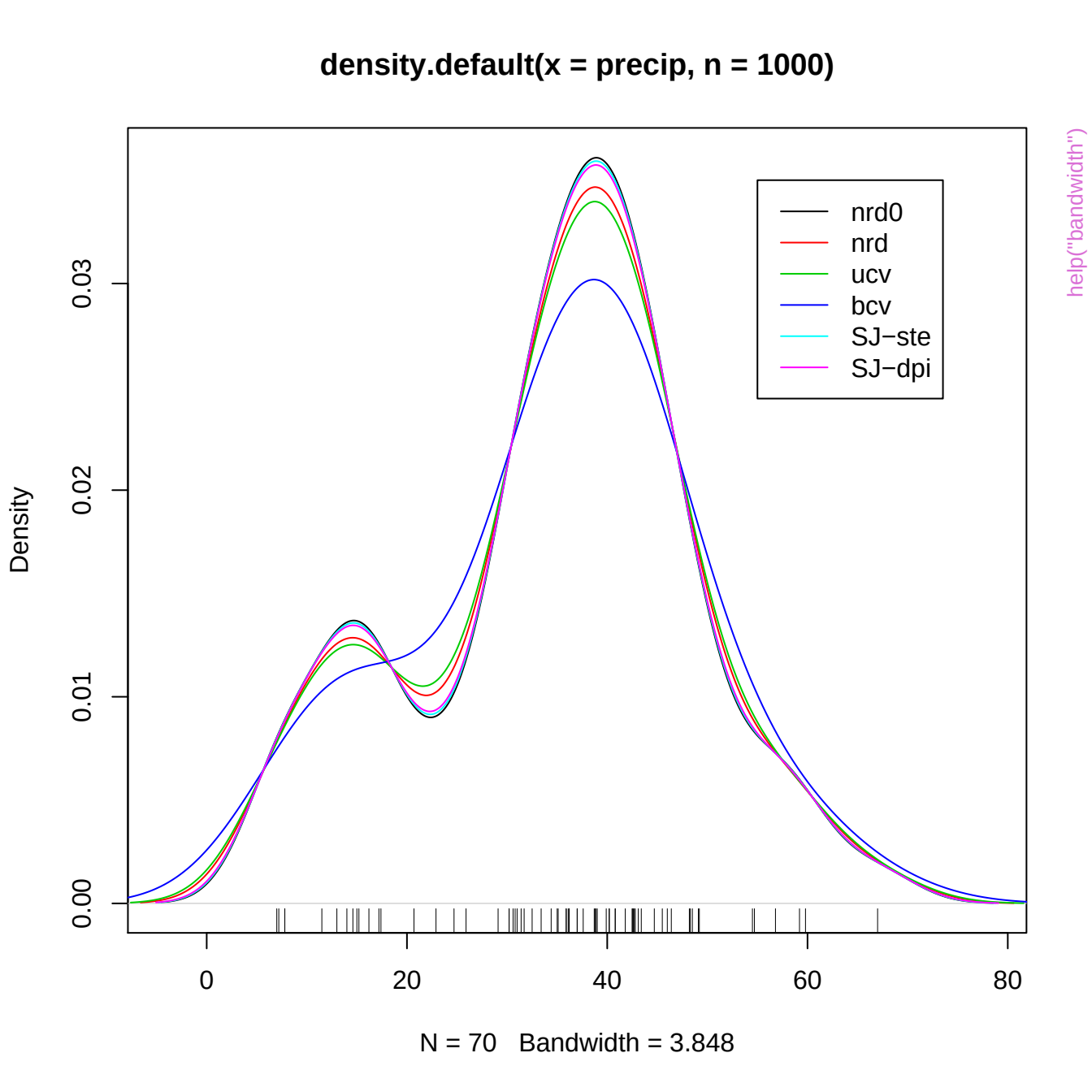

ts.sim
10
0
−10
−20
0
50
100
150
200
Time
help("arima.sim")

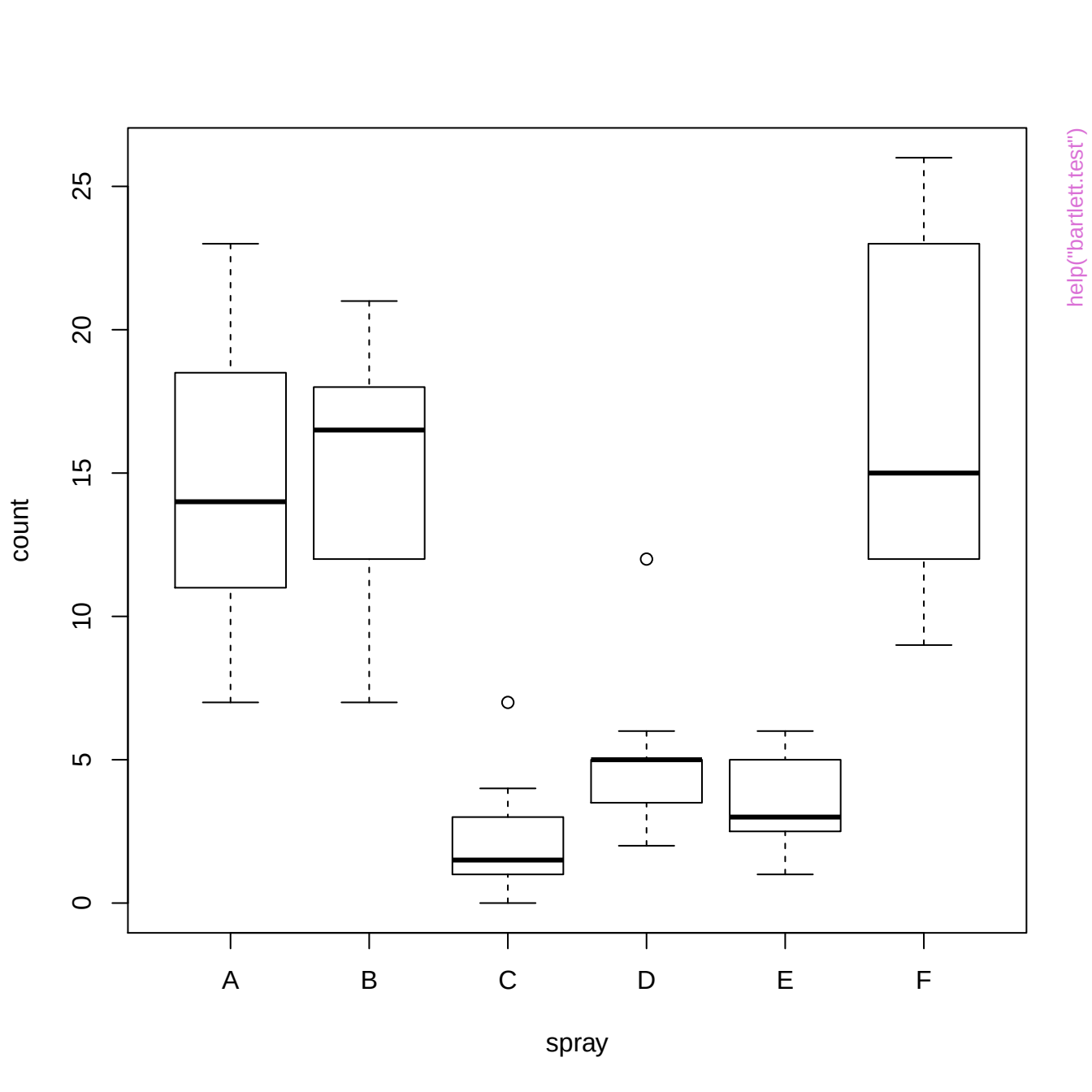


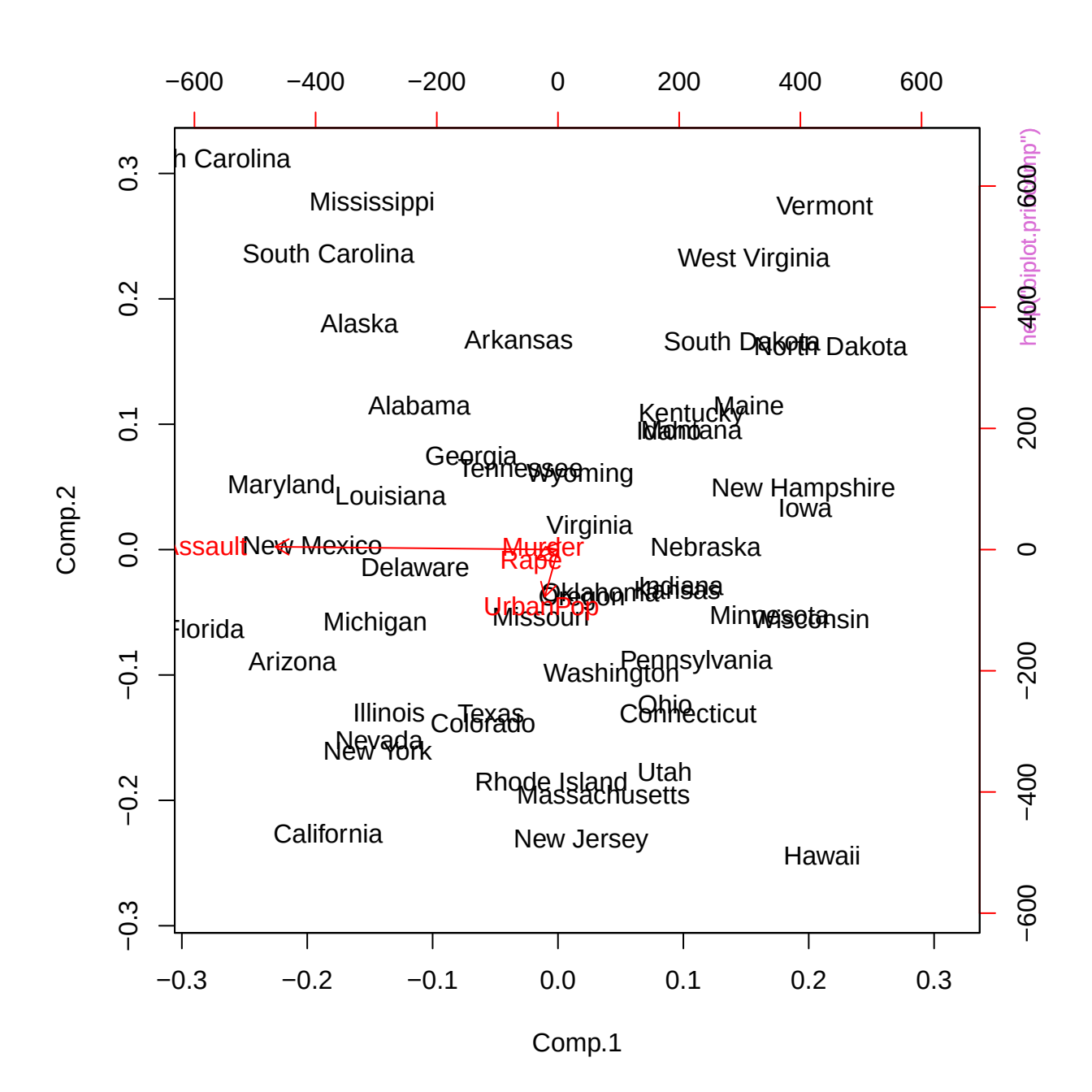


help("as.hclust")


ave(Warpbreaks) for wool x tension combinations
mean
median
breaks
Index
help("ave")

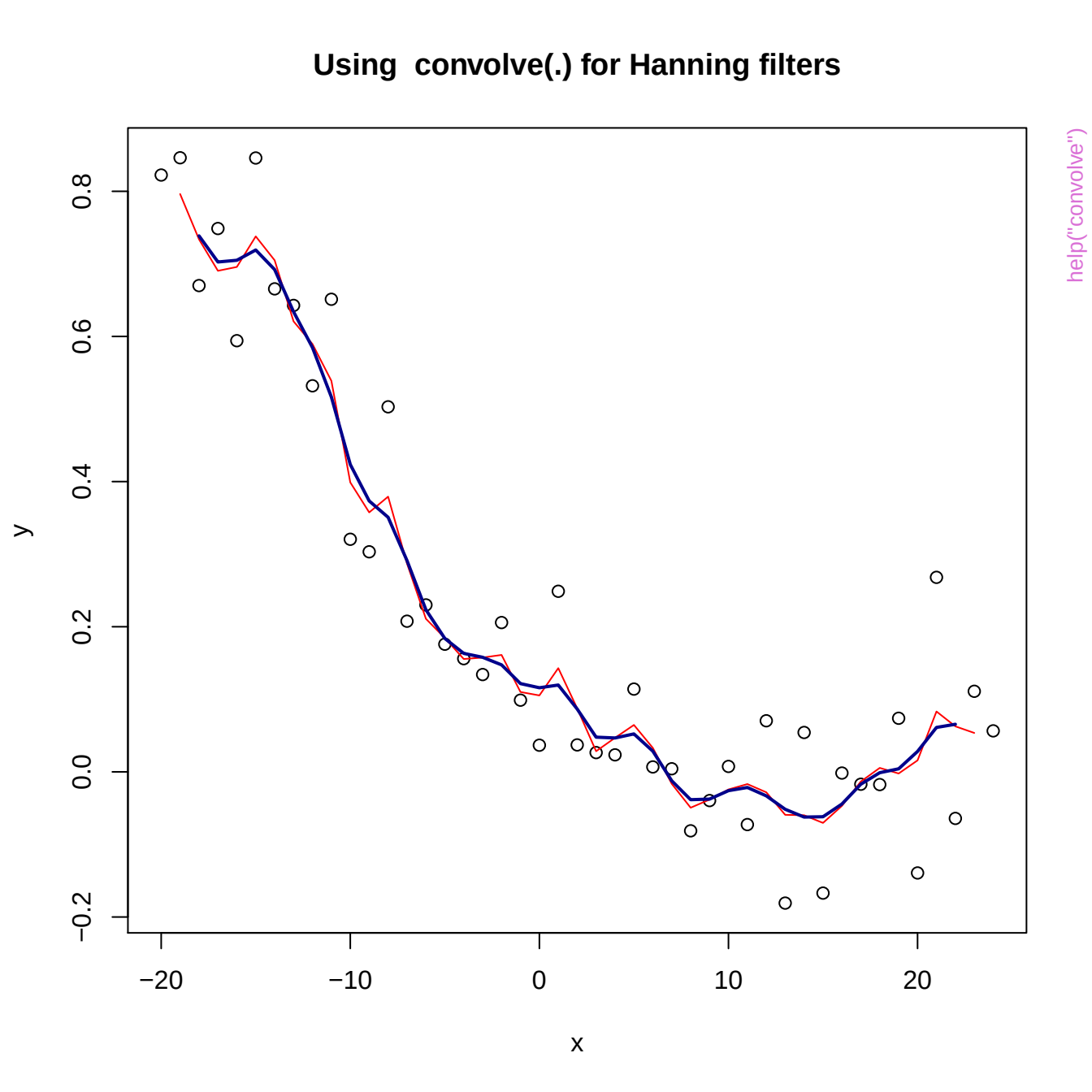

density.default(x = precip, n = 1000)
help("bandwidth")
nrd0
nrd
ucv
bcv
SJ−ste
SJ−dpi
Density
0.00
0.01
0.02
0.03
0
20
40
60
80
N = 70 Bandwidth = 3.848

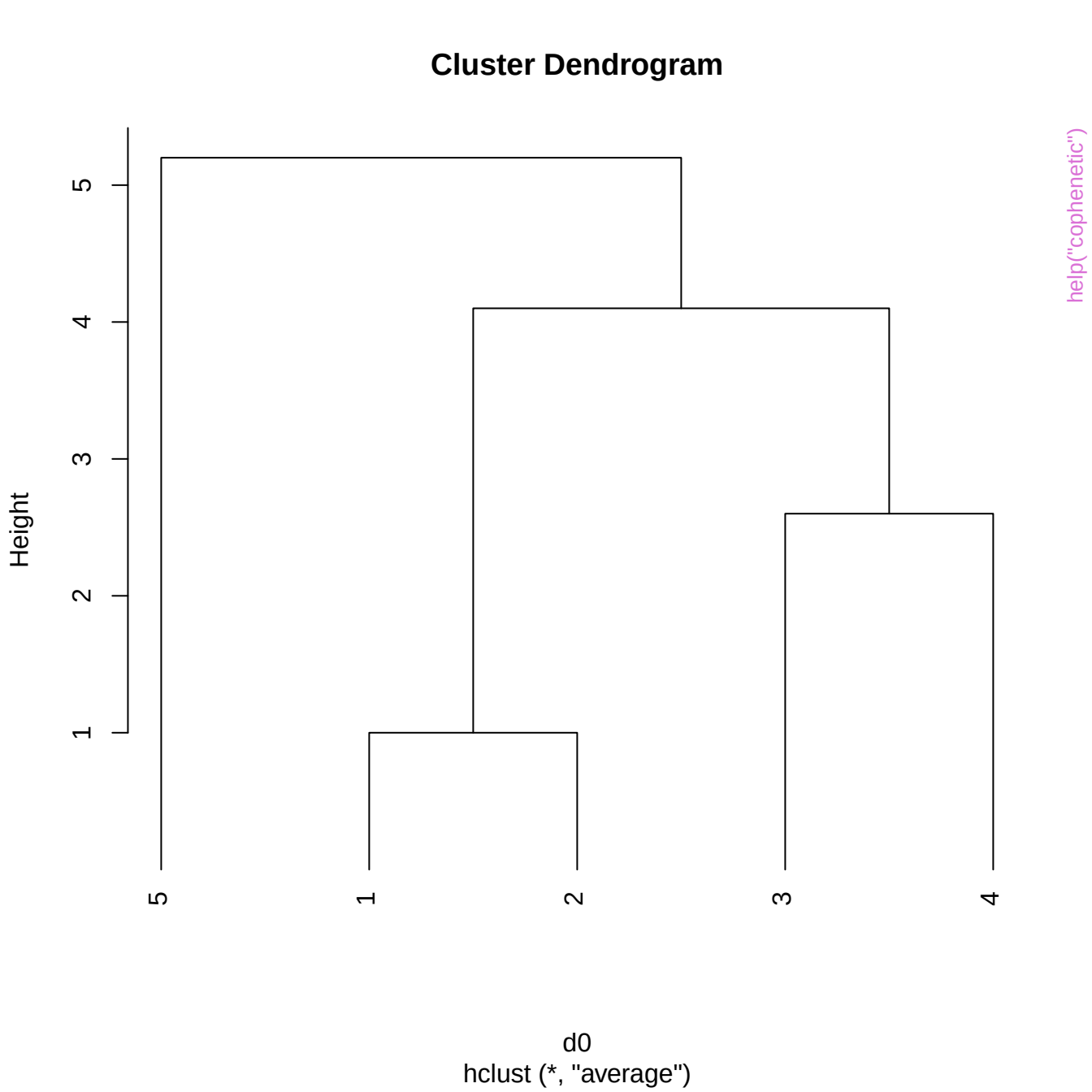

count
0
5
10
15
20
25
A
B
C
D
E
F
spray
help("bartlett.test")

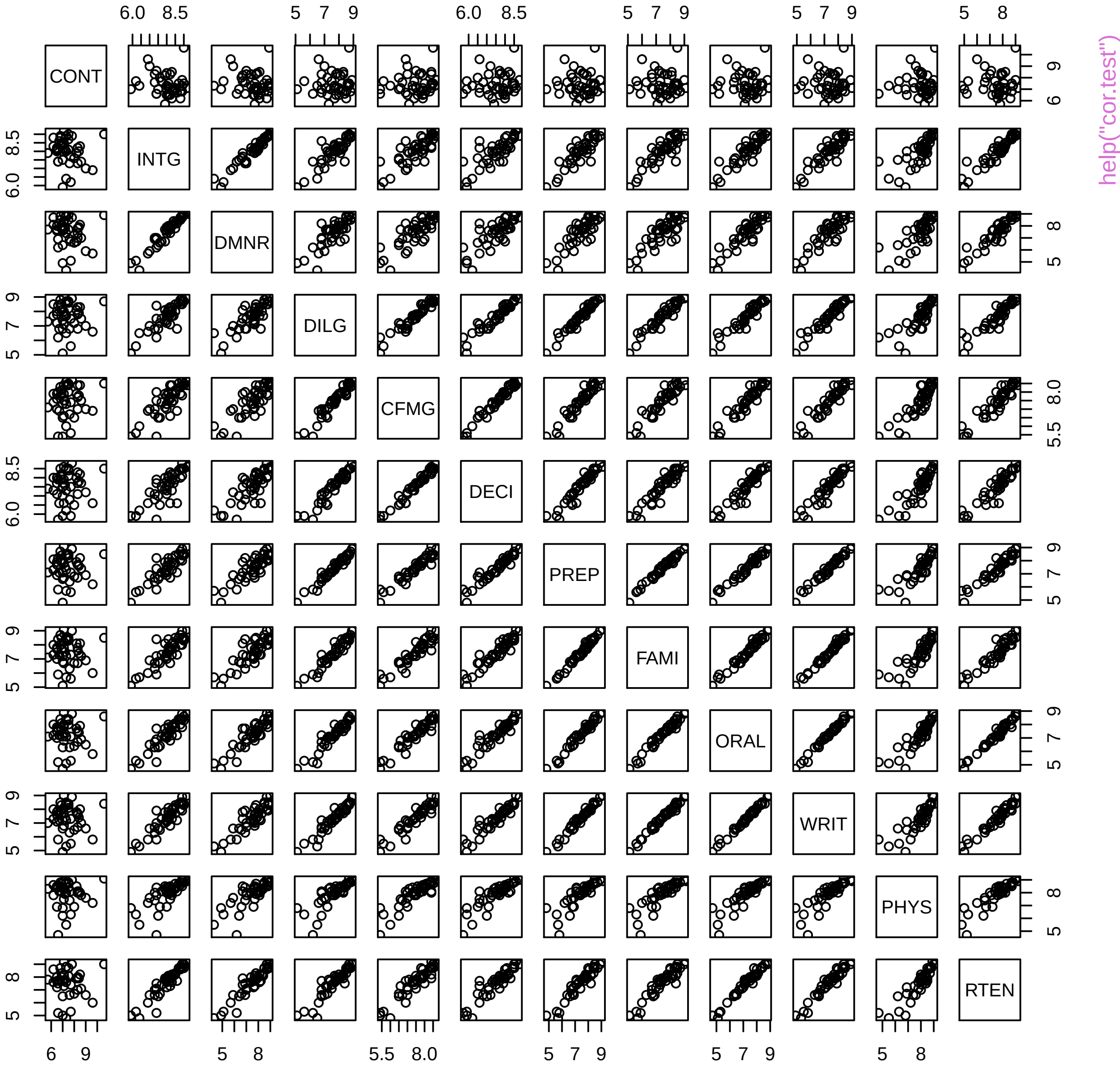

−600
−400
−200
0
200
400
600
h Carolina
Mississippi
Vermont
South Carolina
West Virginia
Alaska
Arkansas
South Dakota
North Dakota
Alabama
Kentucky
Maine
Idaho
Montana
Georgia
Tennessee
Wyoming
Maryland
Louisiana
New Hampshire
Iowa
Virginia
ssault
New Mexico
Murder
Rape
Nebraska
Delaware
Oklahoma
Kansas
Indiana
UrbanPop
Florida
Michigan
Missouri
Minnesota
Wisconsin
Arizona
Pennsylvania
Washington
Ohio
Illinois
Texas
Connecticut
Colorado
Nevada
New York
Utah
Rhode Island
Massachusetts
California
New Jersey
Hawaii
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
Comp.2
Comp.1
hc(biplot.prcomp")

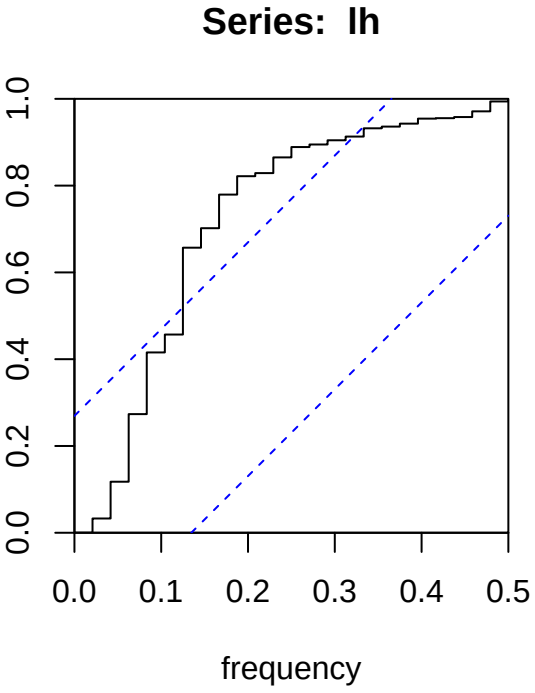
cmdscale(eurodist)

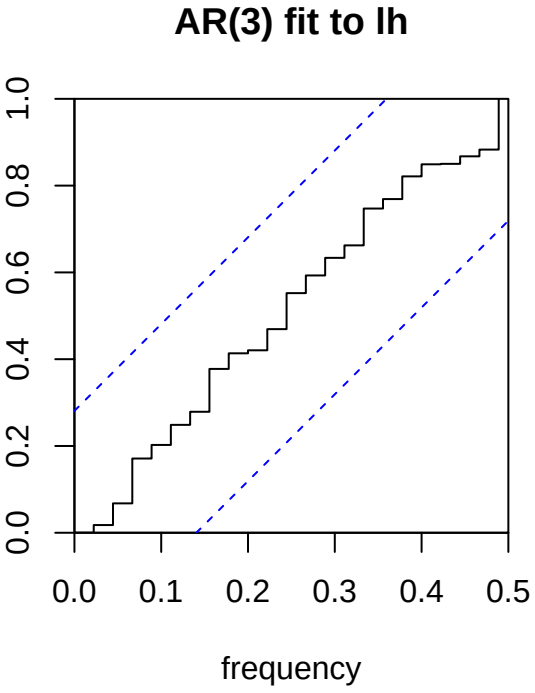
help("cmdscale")


Using convolve(.) for Hanning filters
help("convolve")
y
x
0.8
0.6
0.4
0.2
0.0
−0.2
−20
−10
0
10
20

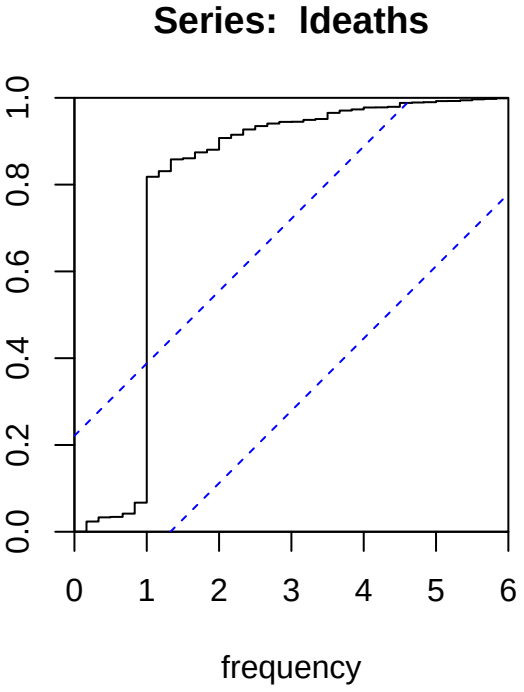

Cluster Dendrogram
Height
1
2
3
4
5
5
1
2
3
4
d0
hclust (*, "average")
help("cophenetic")

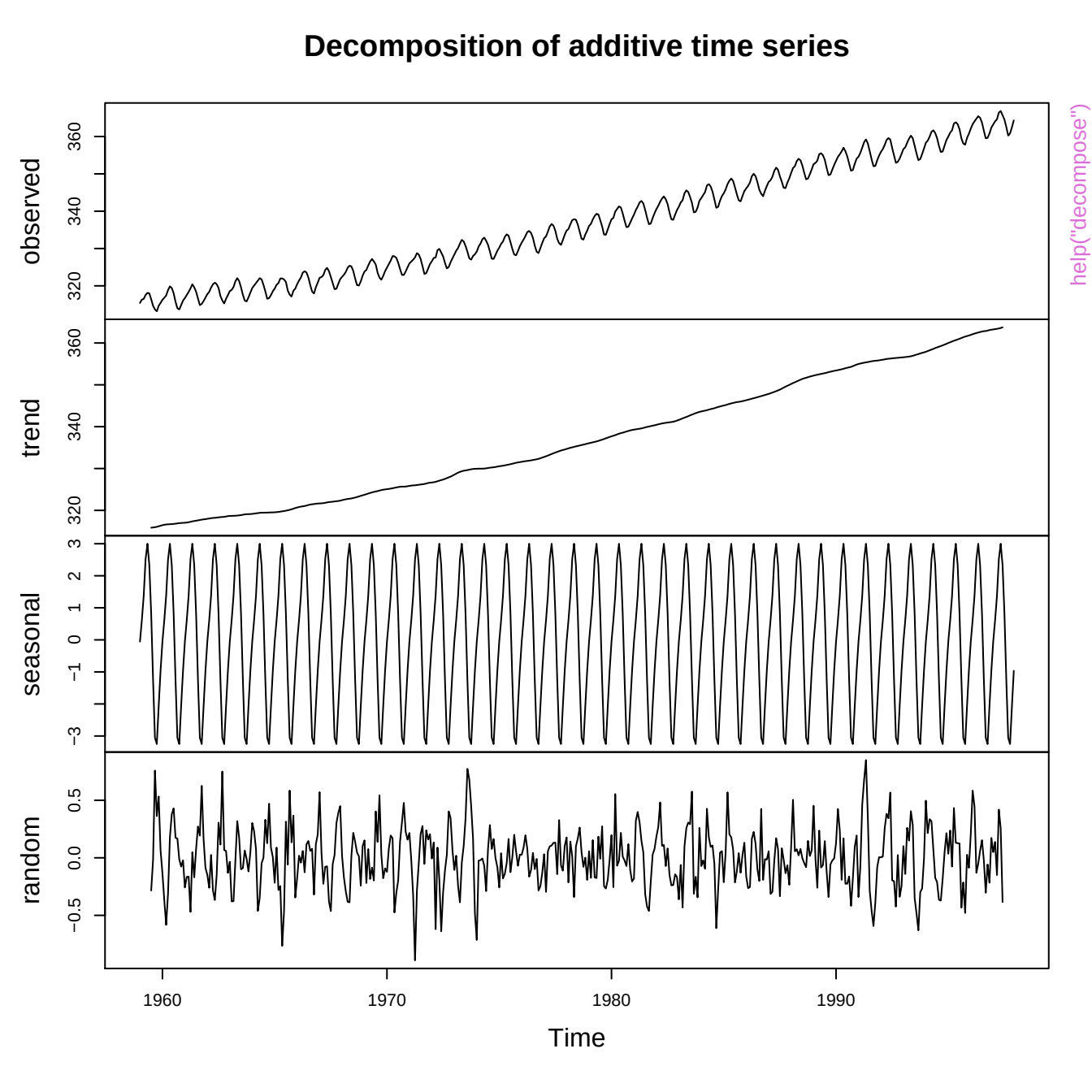

CONT
INTG
DMNR
DILG
CFMG
DECI
PREP
FAMI
ORAL
WRIT
PHYS
RTEN
help("cor.test")

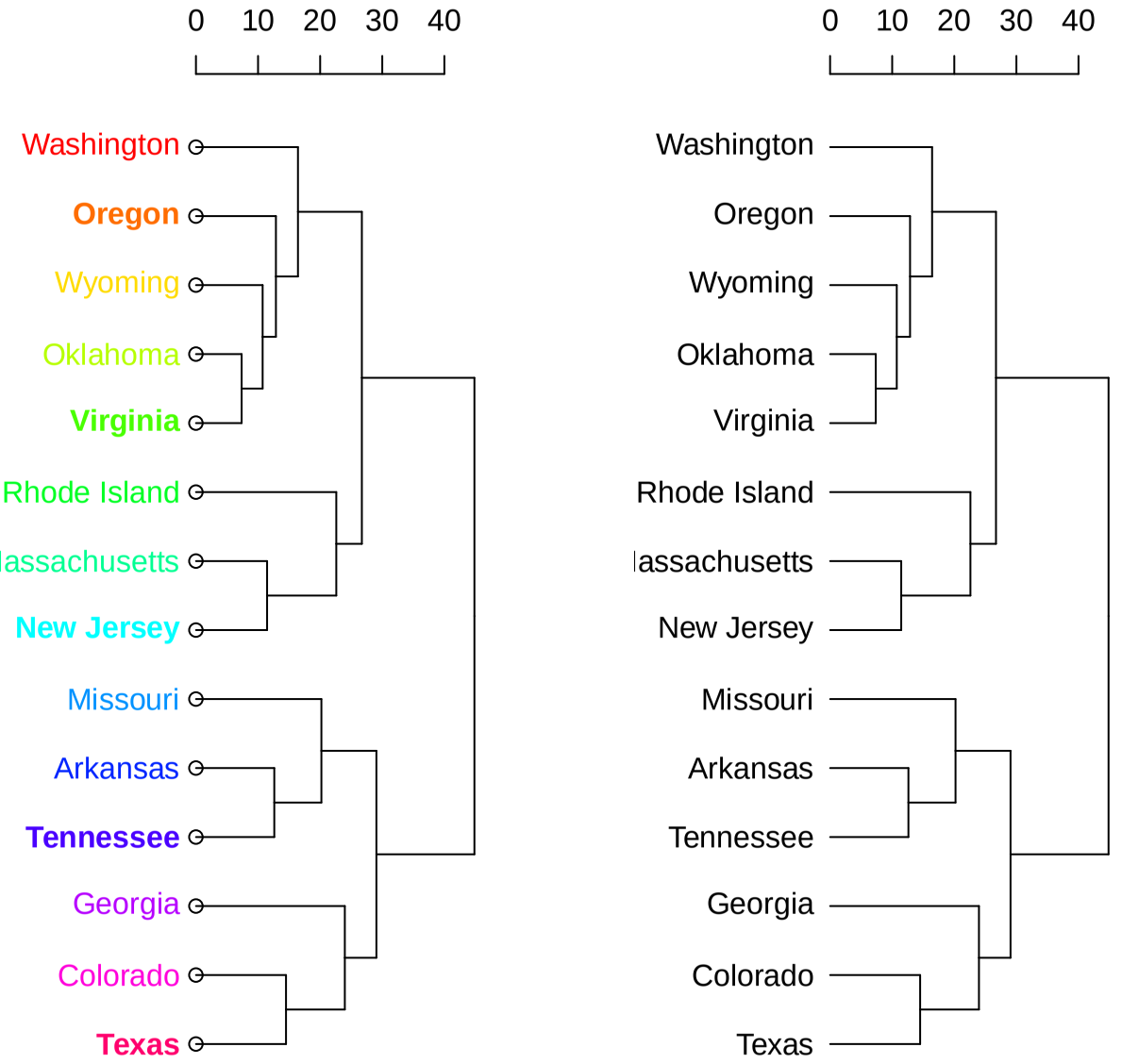

Series: lh
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.1
0.2
0.3
0.4
0.5
frequency


AR(3) fit to lh
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

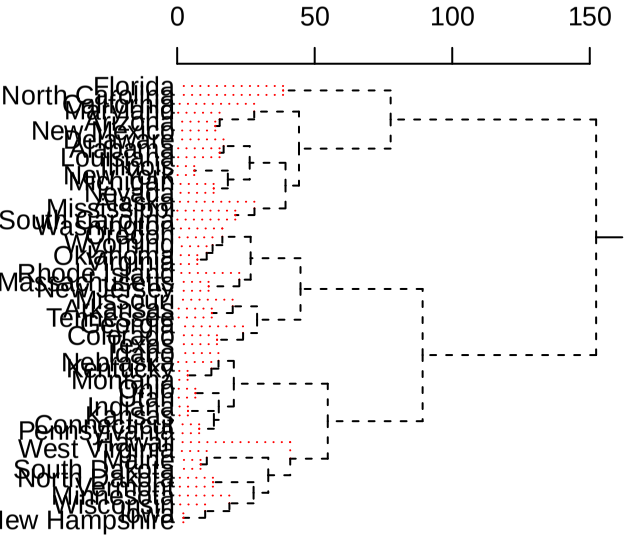
help("cpgram")

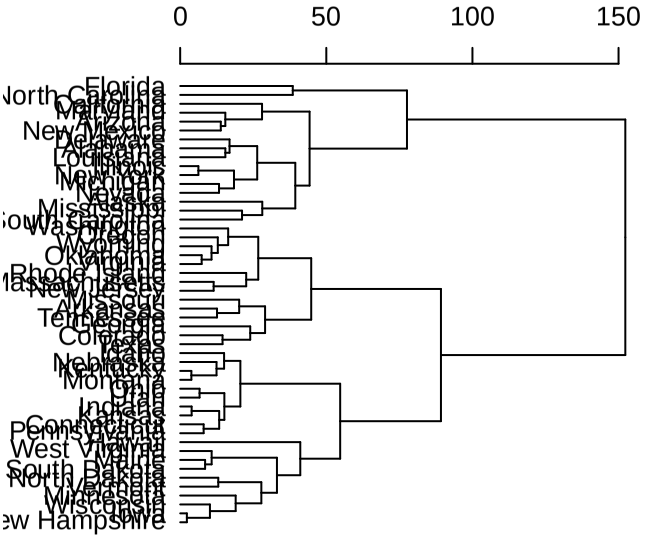

Series: ldeaths
0.0
0.2
0.4
0.6
0.8
1.0
0
1
2
3
4
5
6
frequency

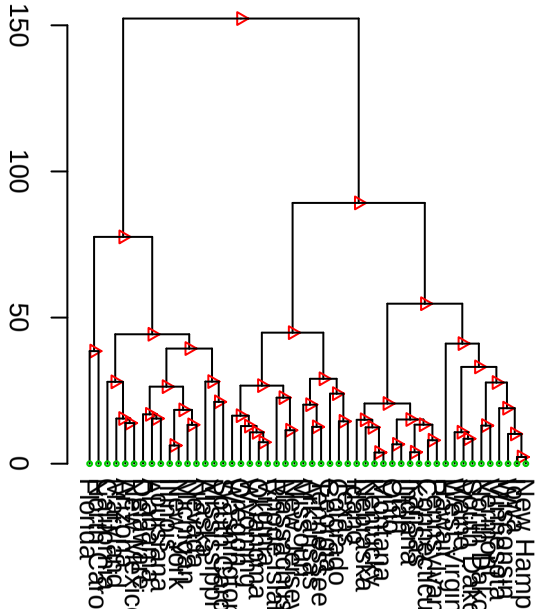

Decomposition of additive time series
observed
trend
seasonal
random
360
340
320
3
2
1
0
−1
−3
0.5
0.0
−0.5
1960
1970
1980
1990
Time
help("decompose")

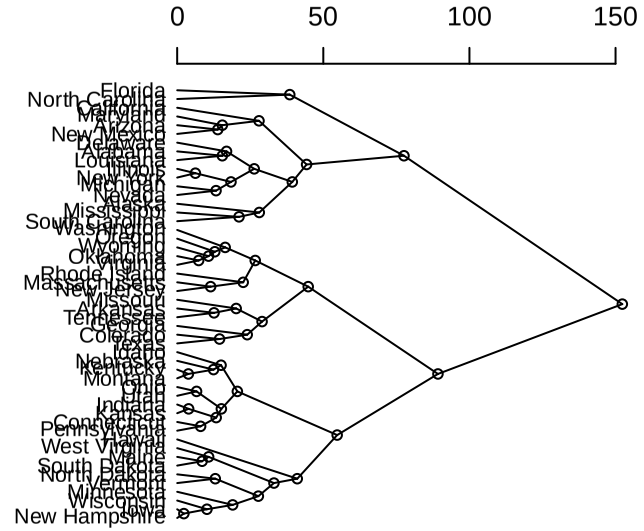


help("dendrapply")

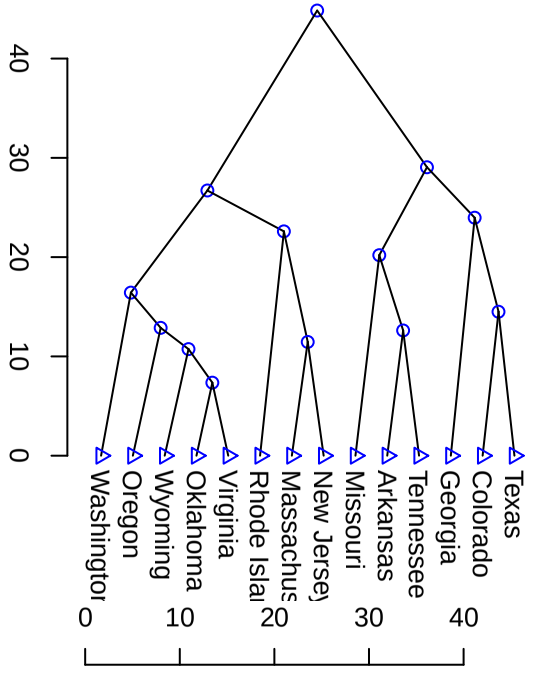


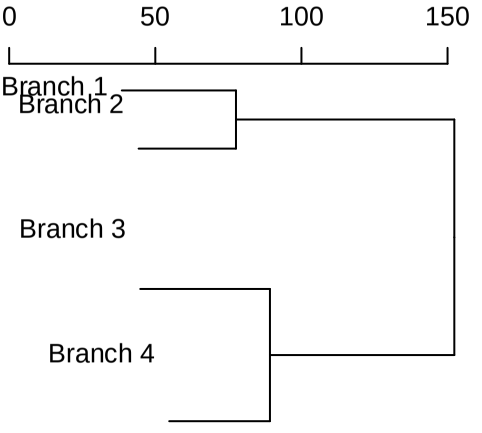


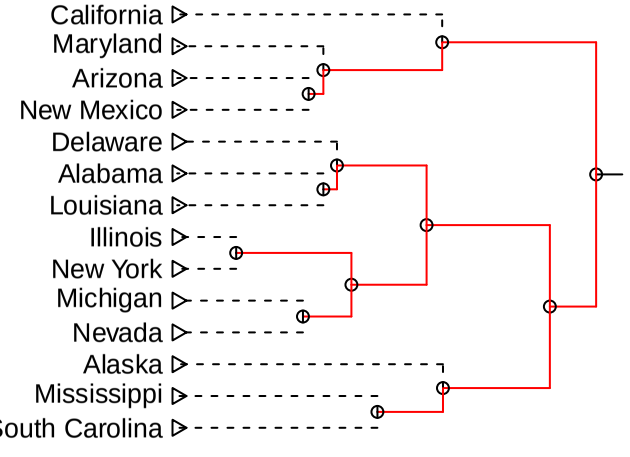


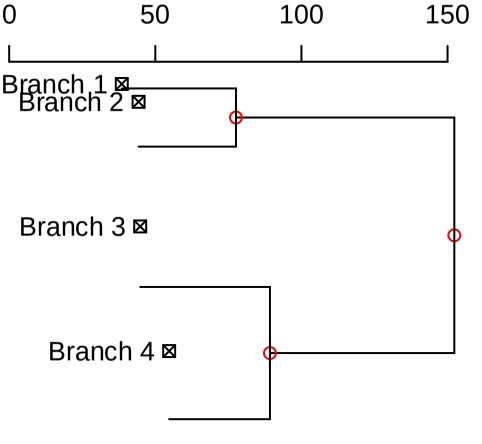


help("dendrogram")

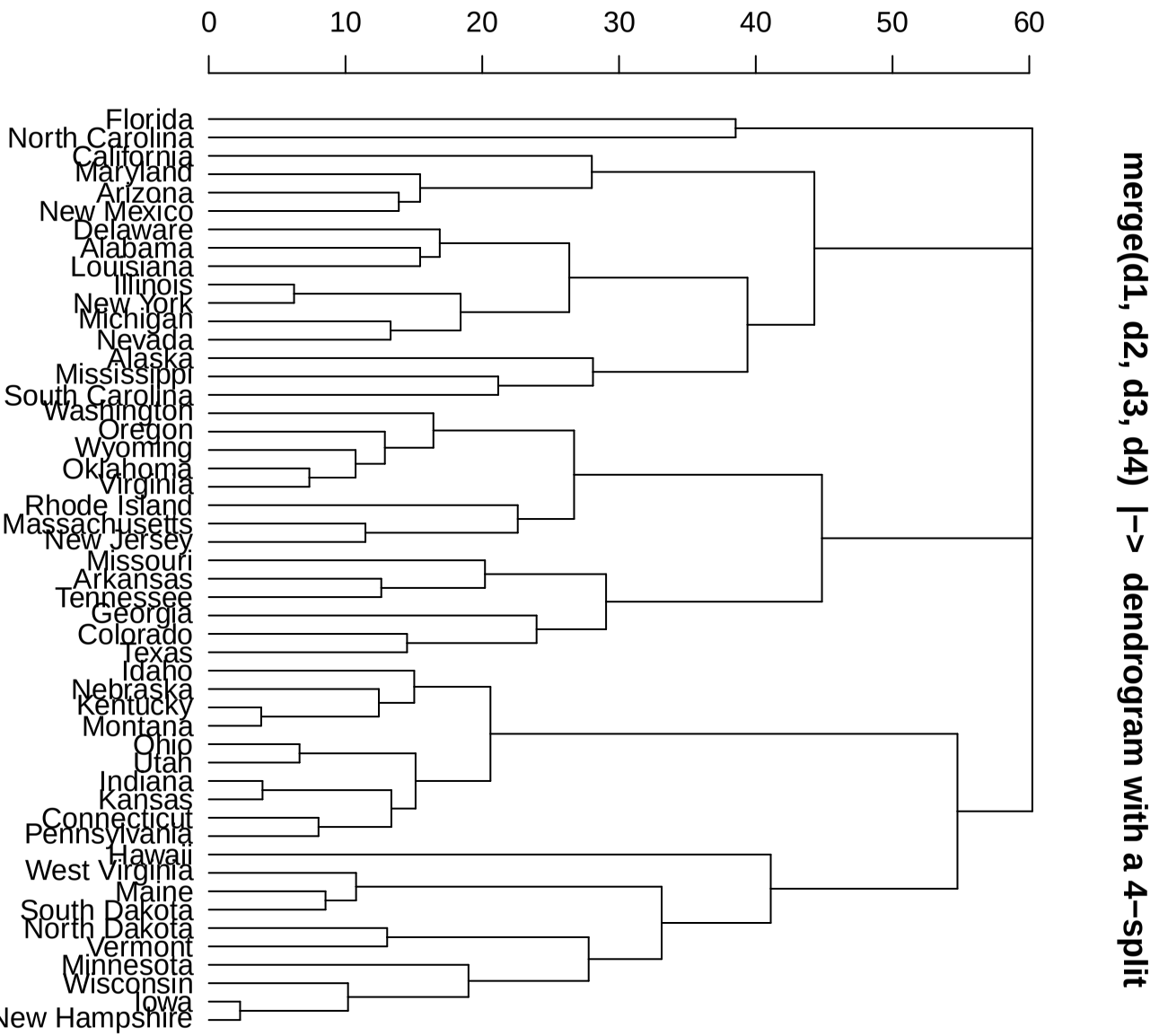




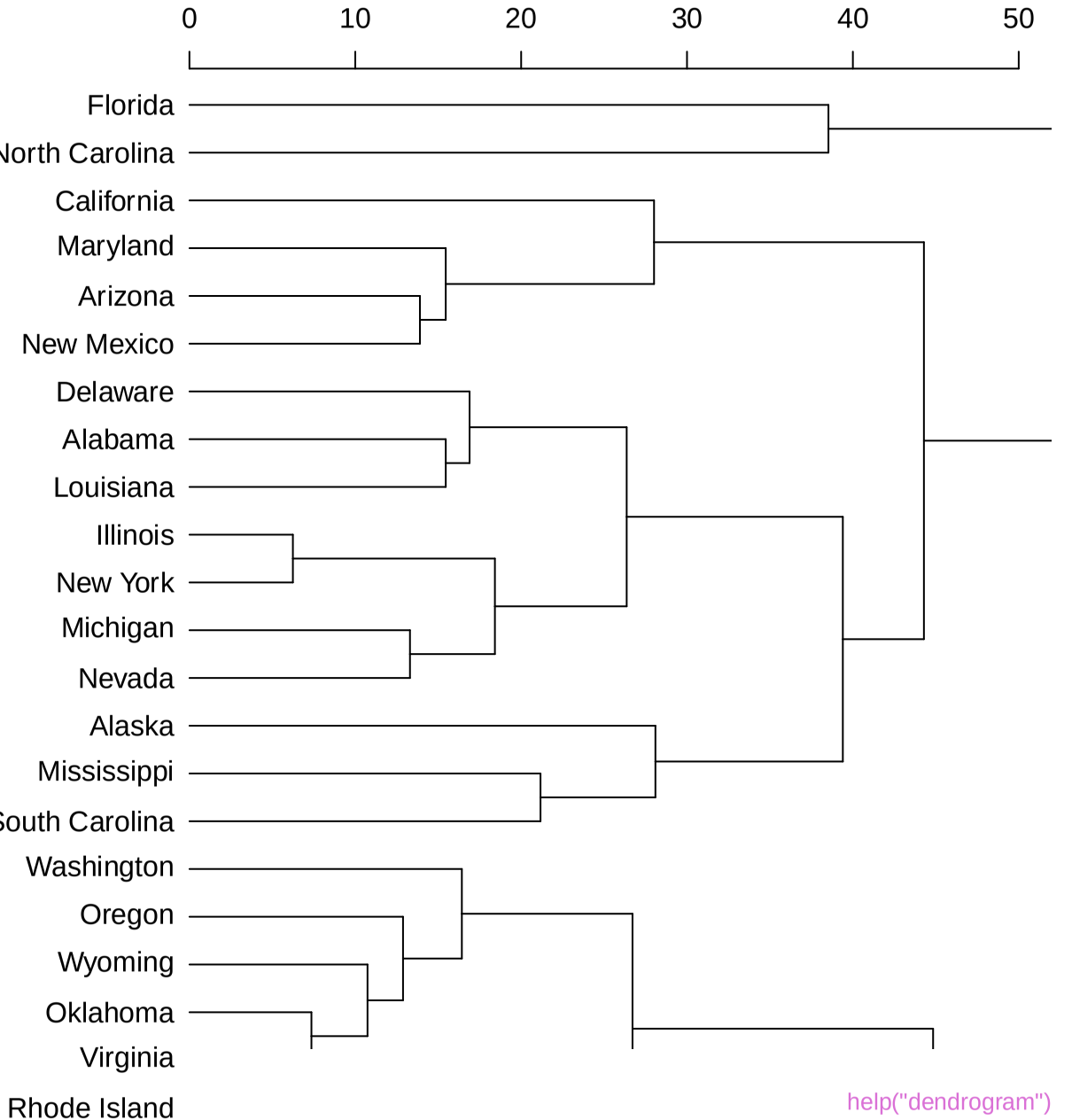


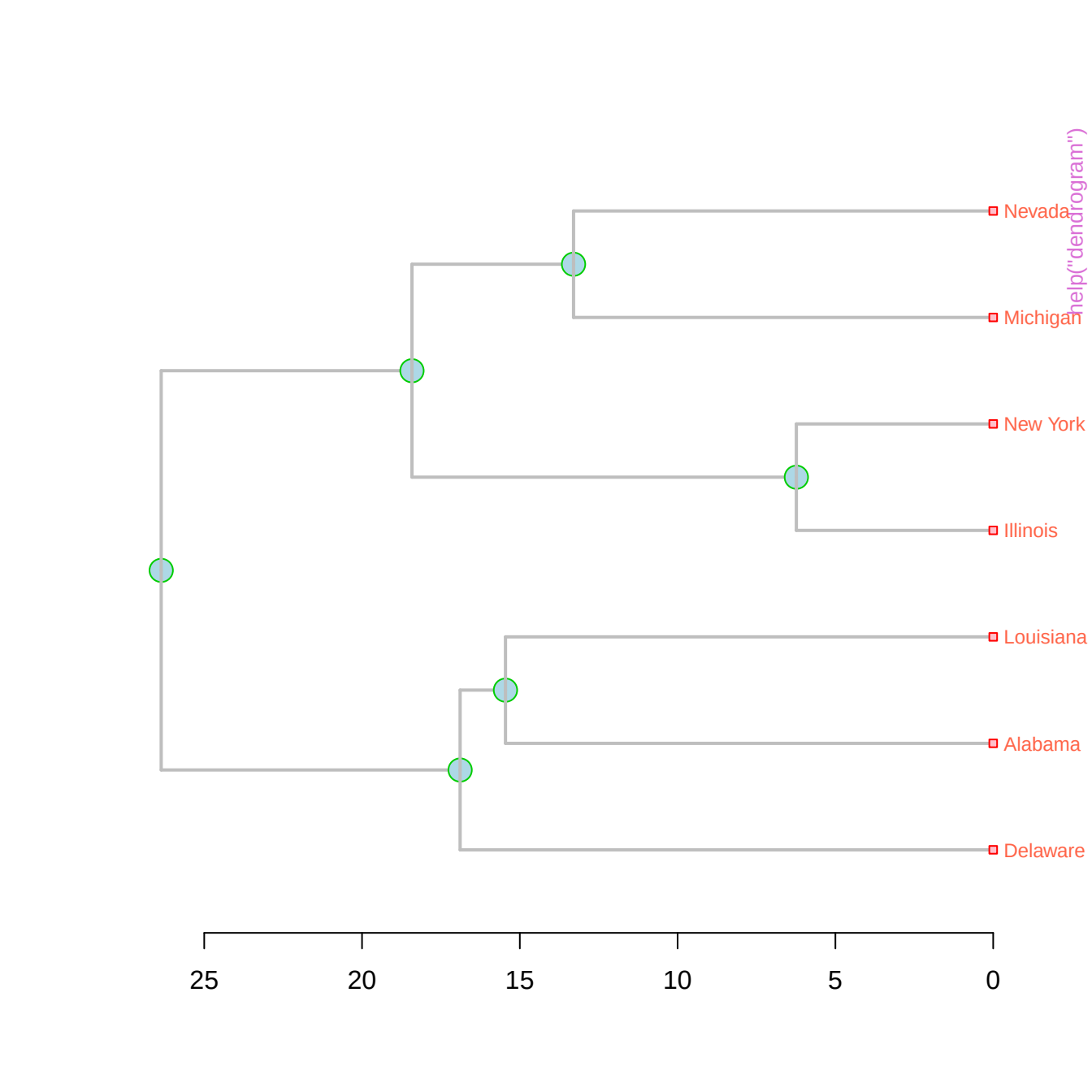


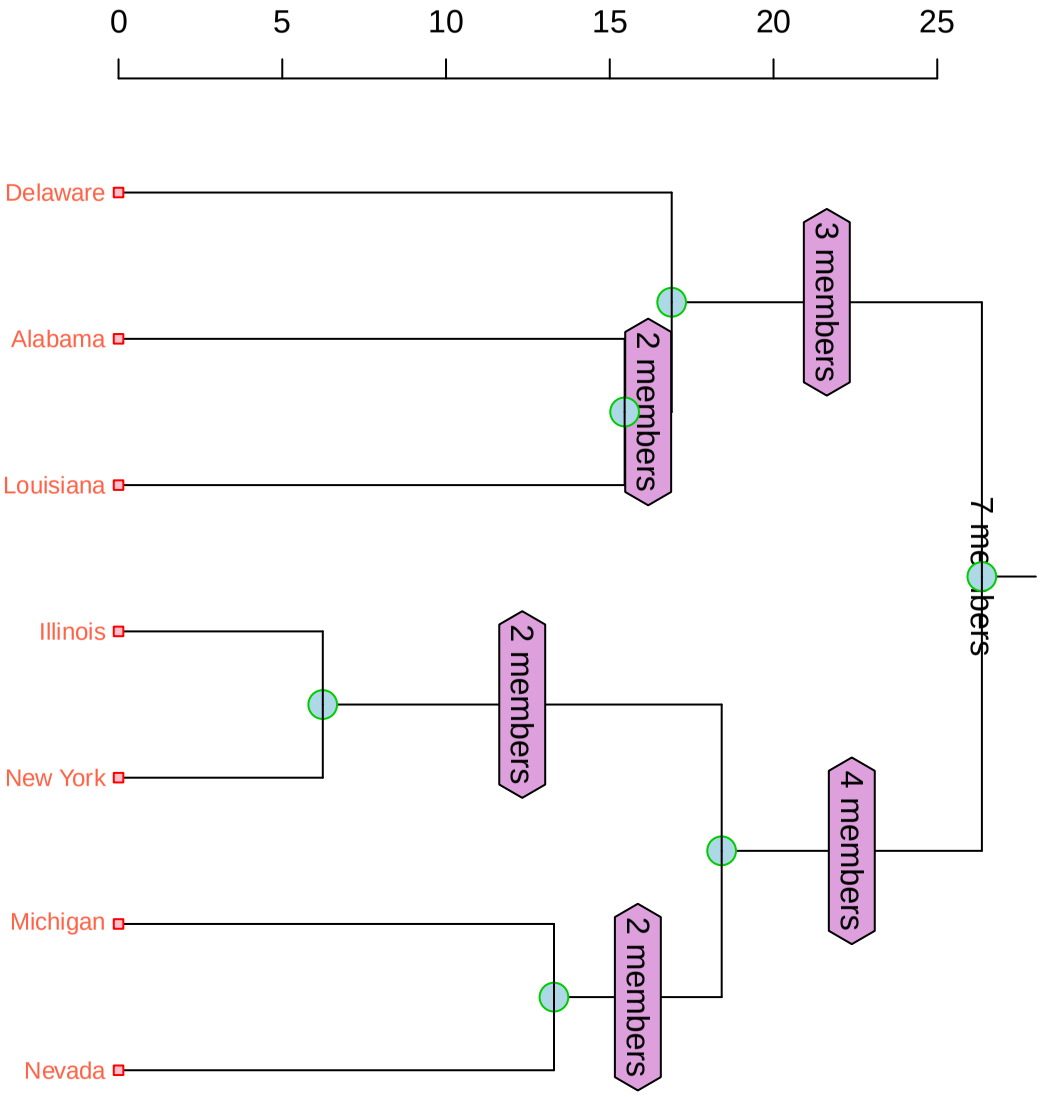
help("dendrogram")



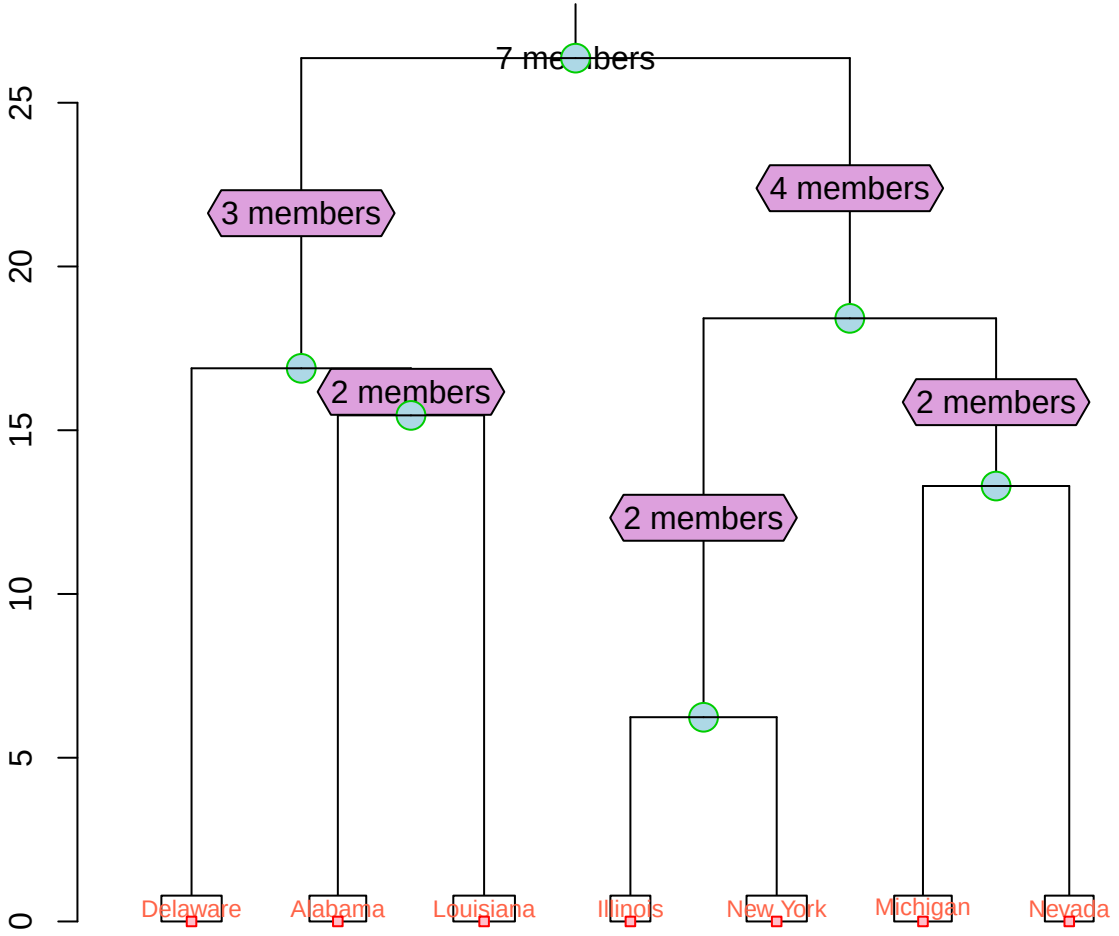
help("dendrogram")


0
10
20
30
40
50
Florida
North Carolina
California
Maryland
Arizona
New Mexico
Delaware
Alabama
Louisiana
Illinois
New York
Michigan
Nevada
Alaska
Mississippi
South Carolina
Washington
Oregon
Wyoming
Oklahoma
Virginia
Rhode Island
help("dendrogram")

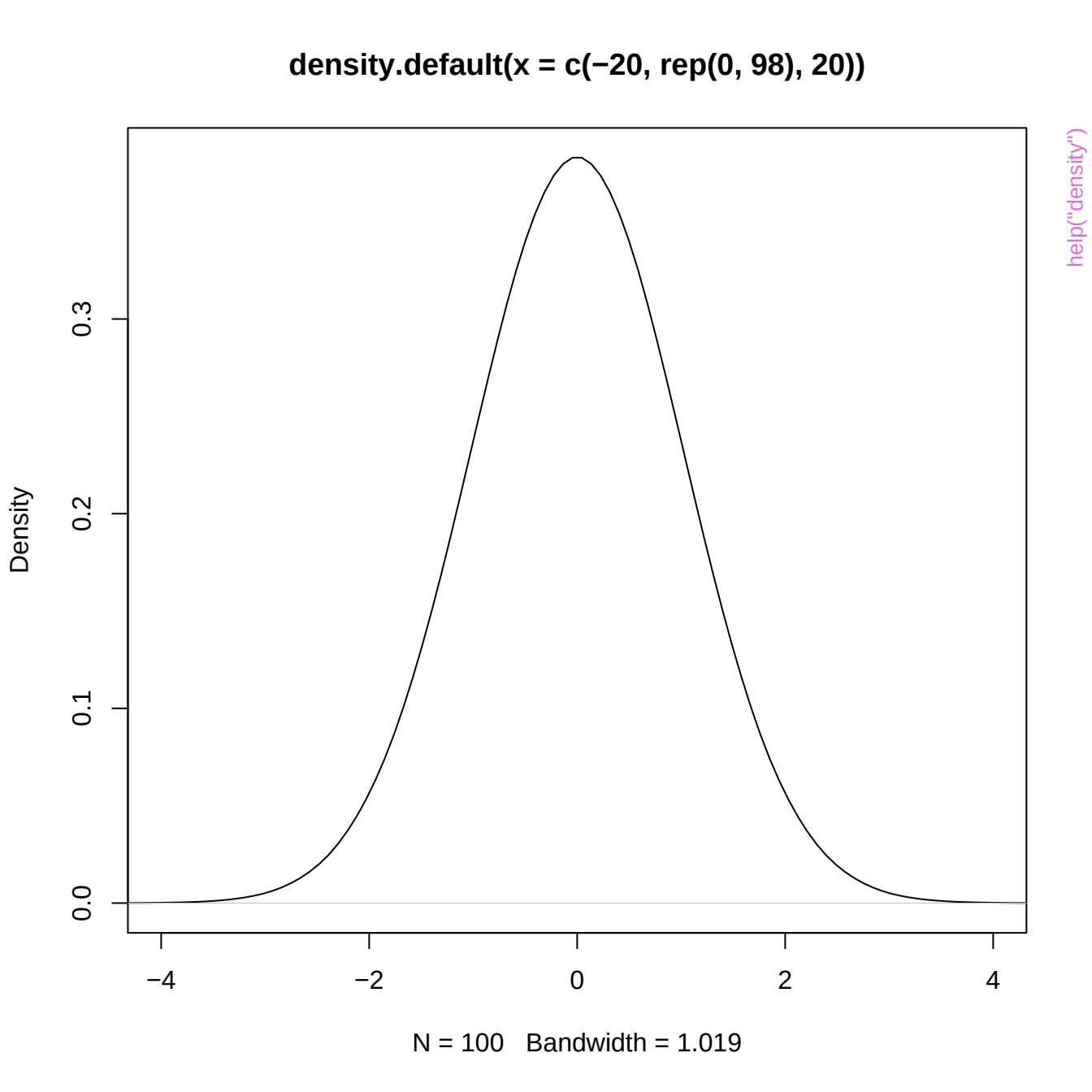

help("dendrogram")
Nevada
Michigan
New York
Illinois
Louisiana
Alabama
Delaware
25
20
15
10
5
0

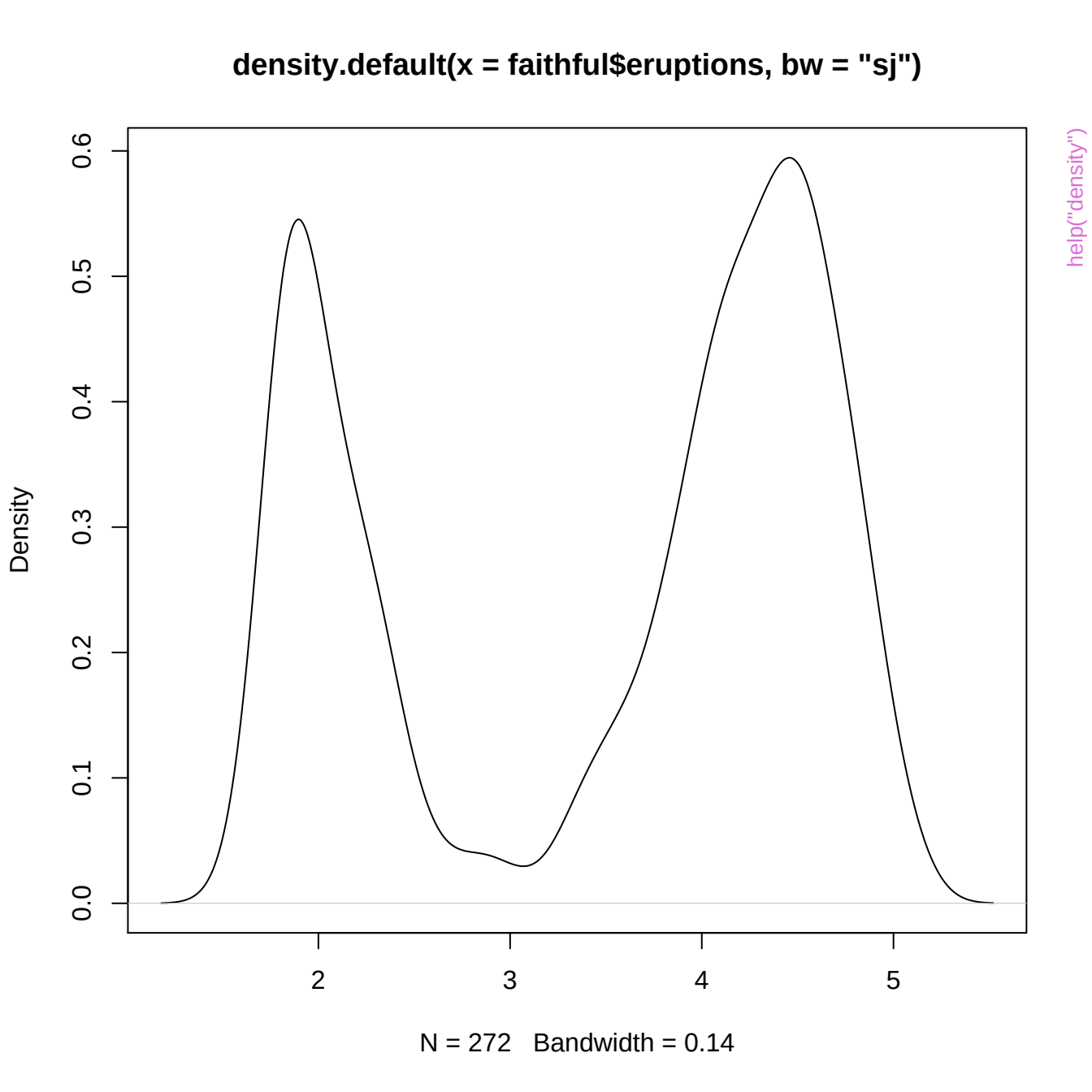


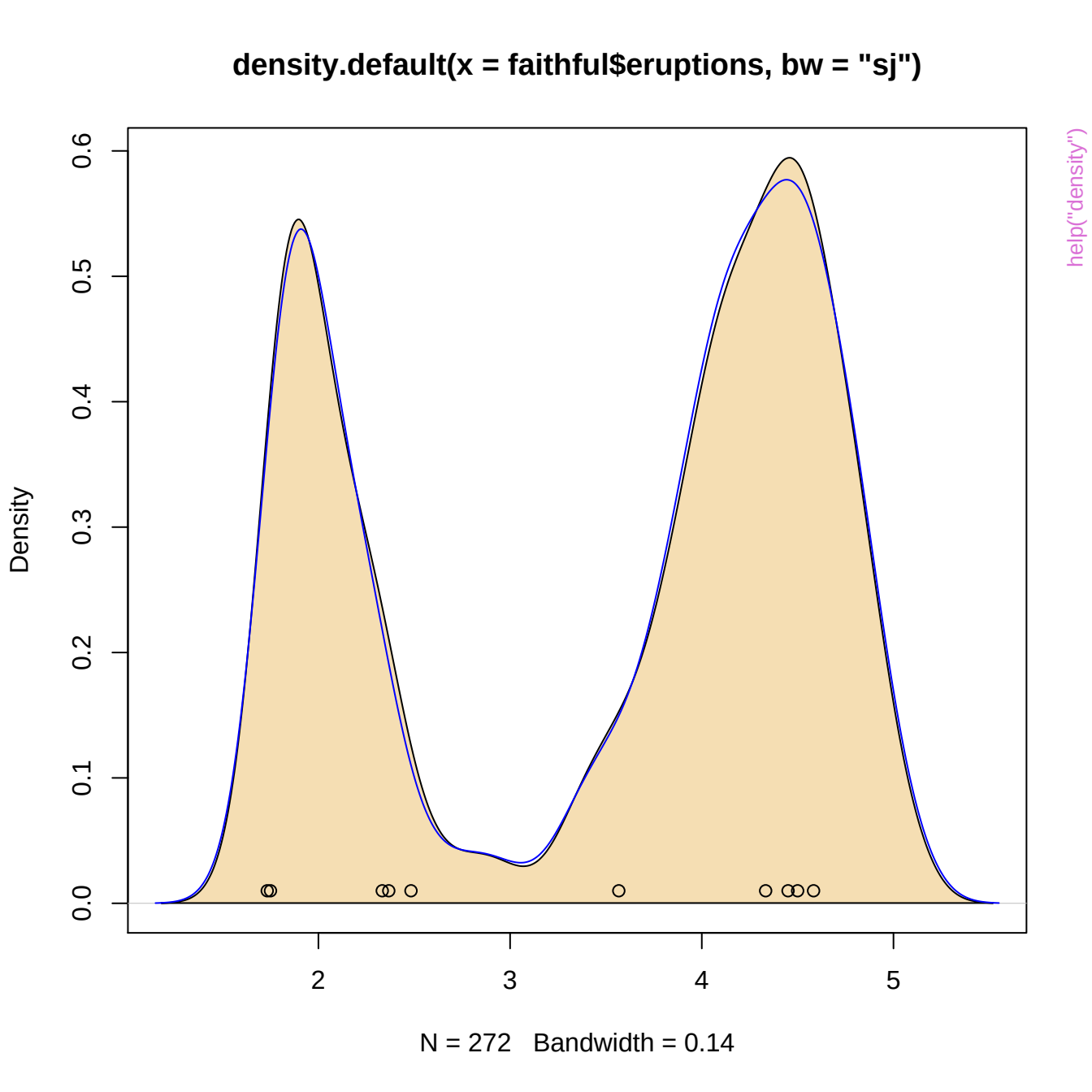
help("dendrogram")

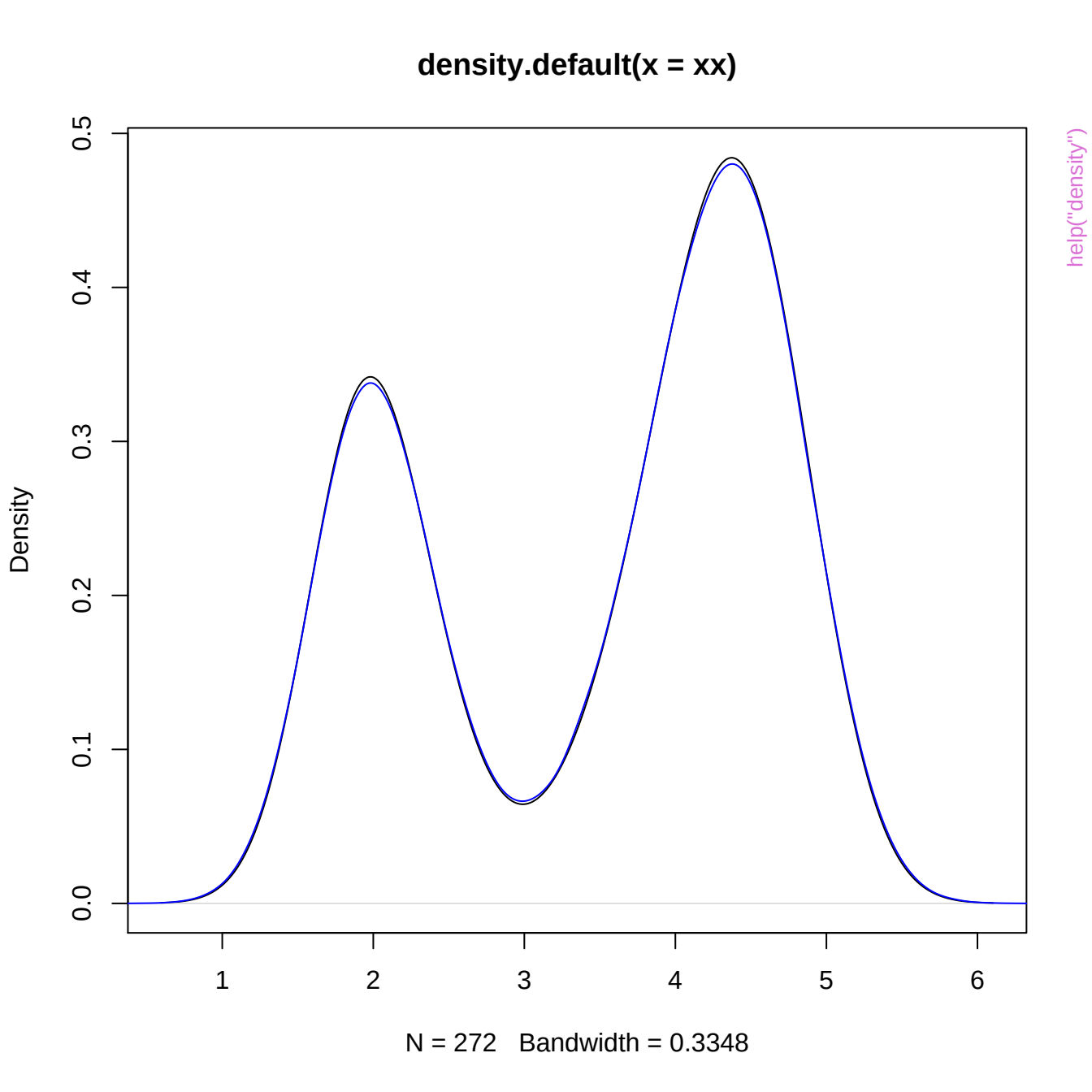


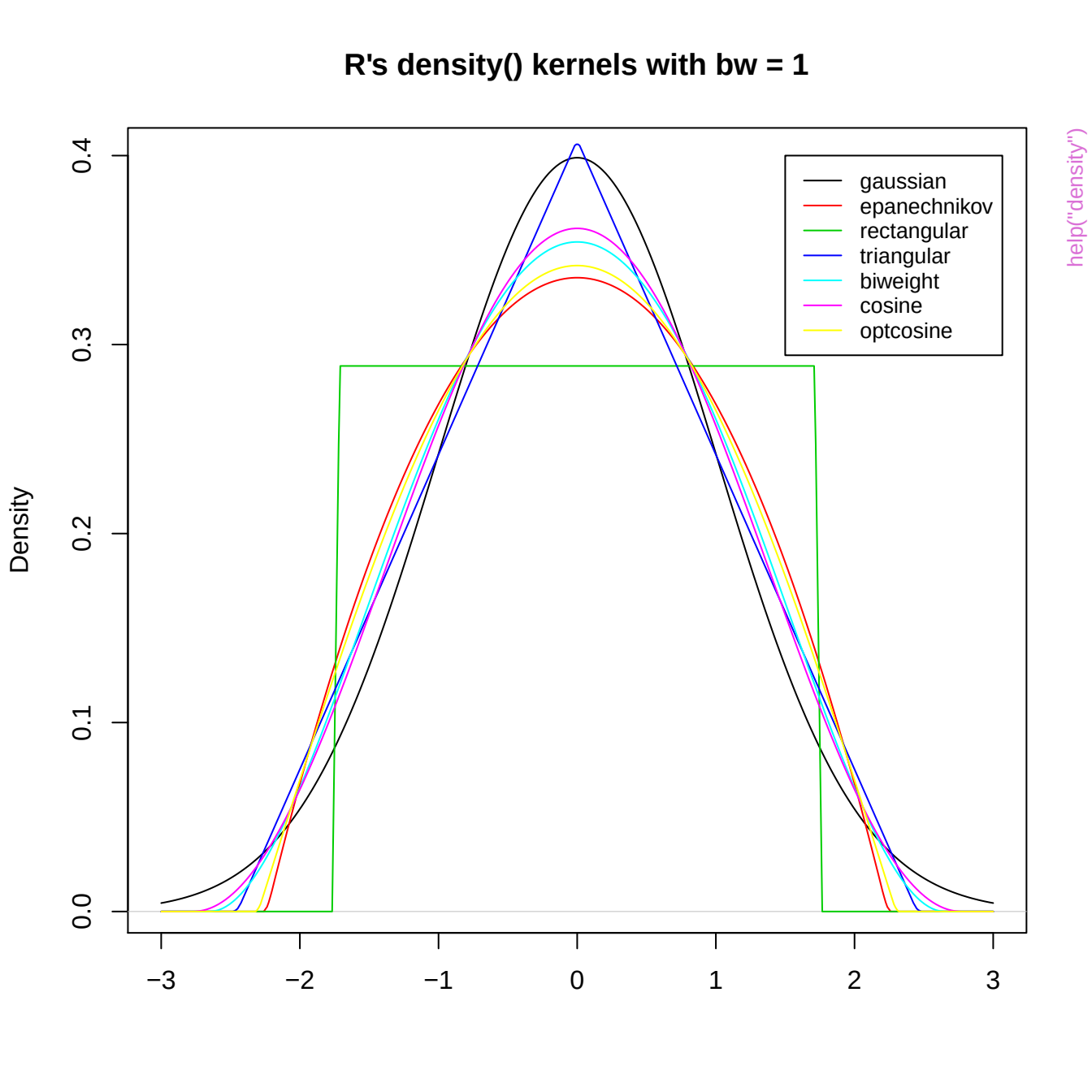
help("dendrogram")

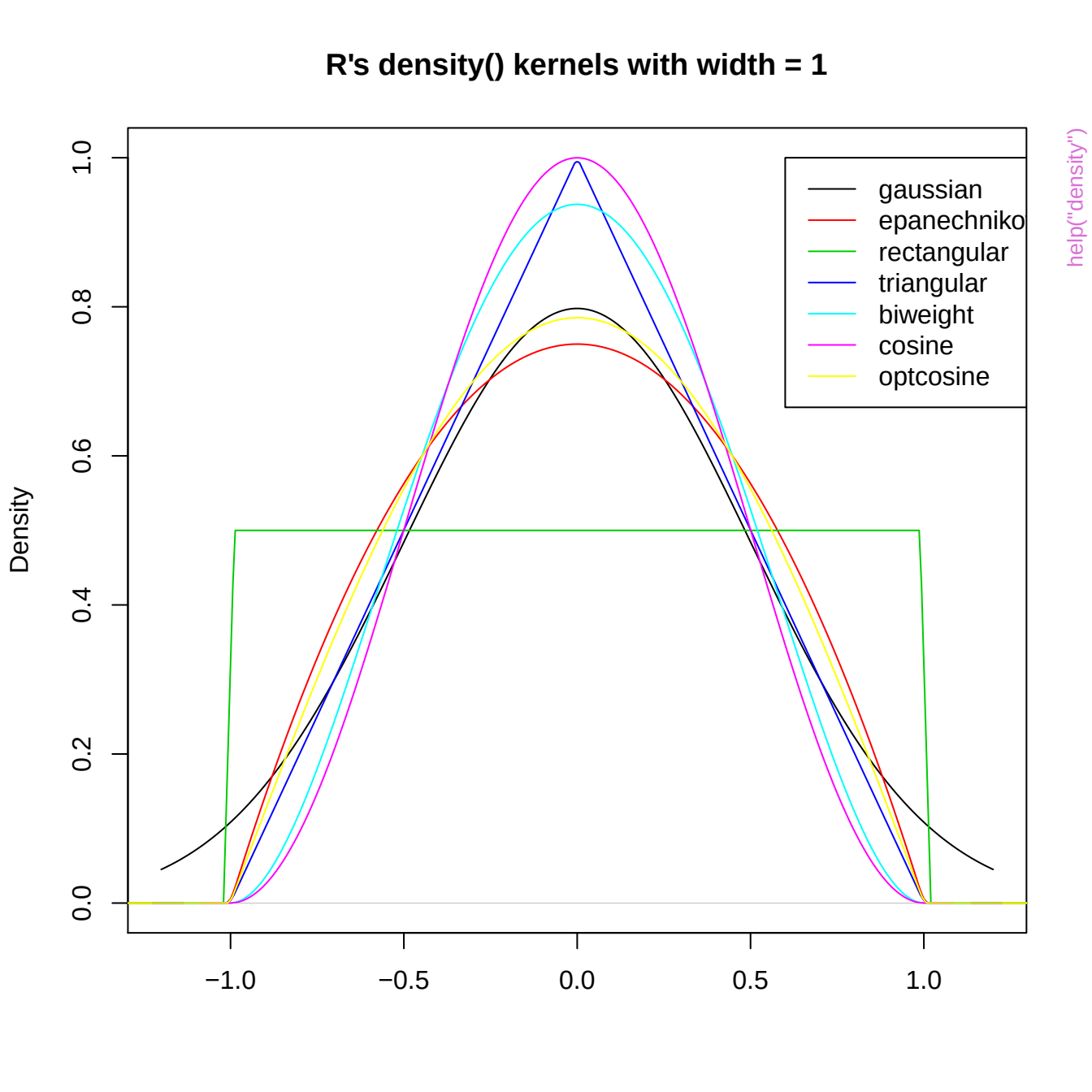

density.default(x = c(−20, rep(0, 98), 20))
help("density")
Density
0.0
0.1
0.2
0.3
−4
−2
0
2
4
N = 100 Bandwidth = 1.019

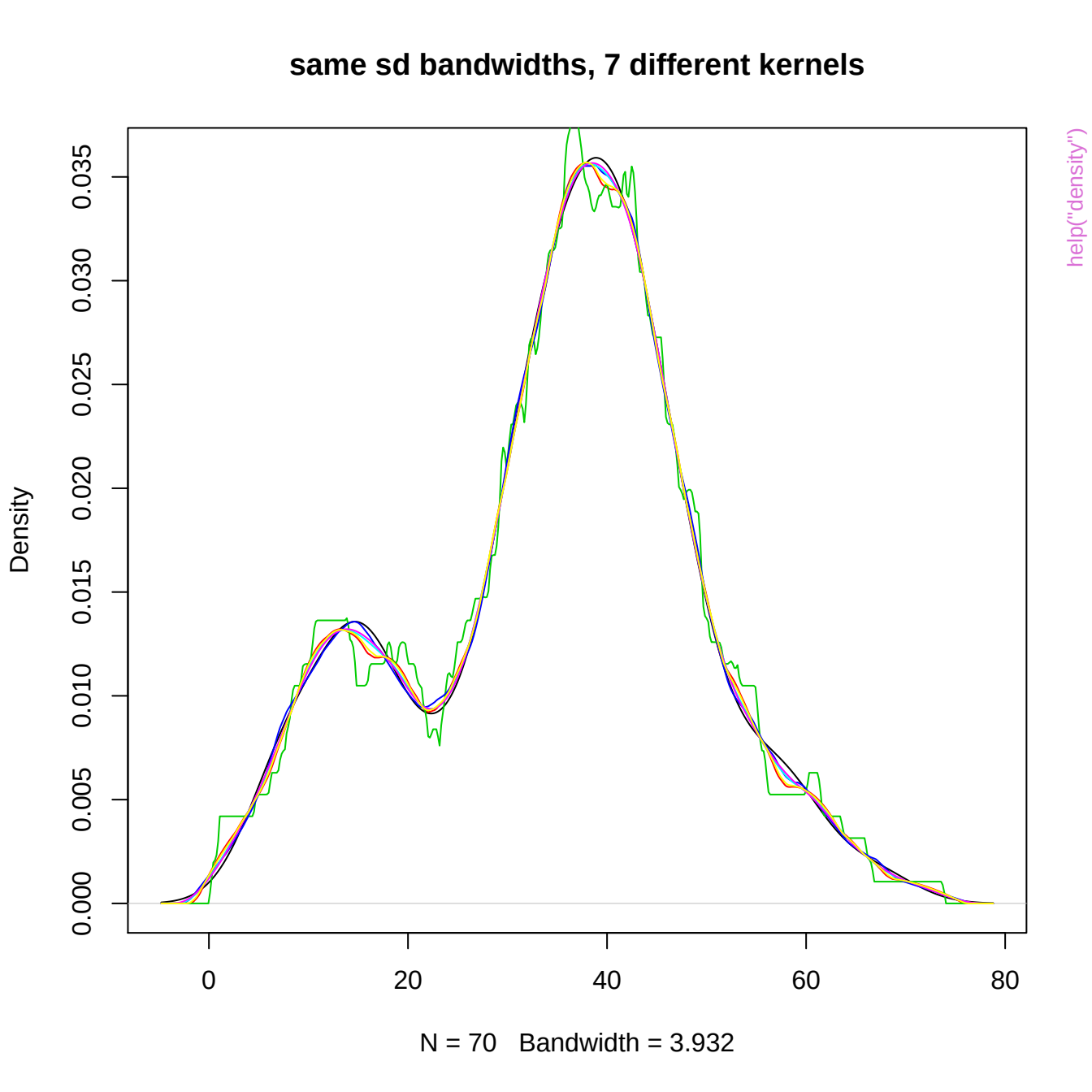

density.default(x = faithful$eruptions, bw = "sj")
Density
0.0
0.1
0.2
0.3
0.4
0.5
0.6
2
3
4
5
N = 272 Bandwidth = 0.14
help("density")

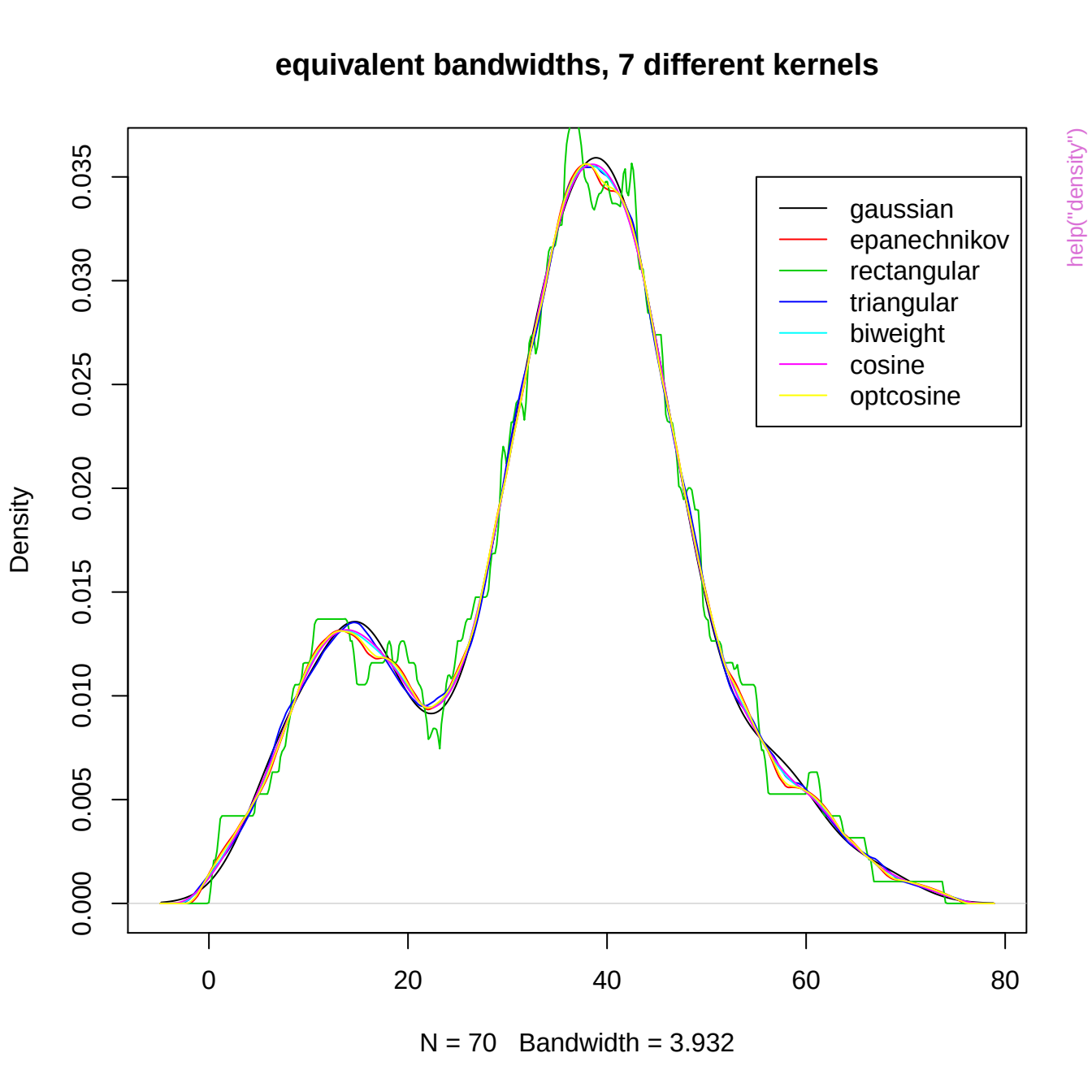

density.default(x = faithful$eruptions, bw = "sj")
Density
0.0
0.1
0.2
0.3
0.4
0.5
0.6
2
3
4
5
N = 272 Bandwidth = 0.14
help("density")

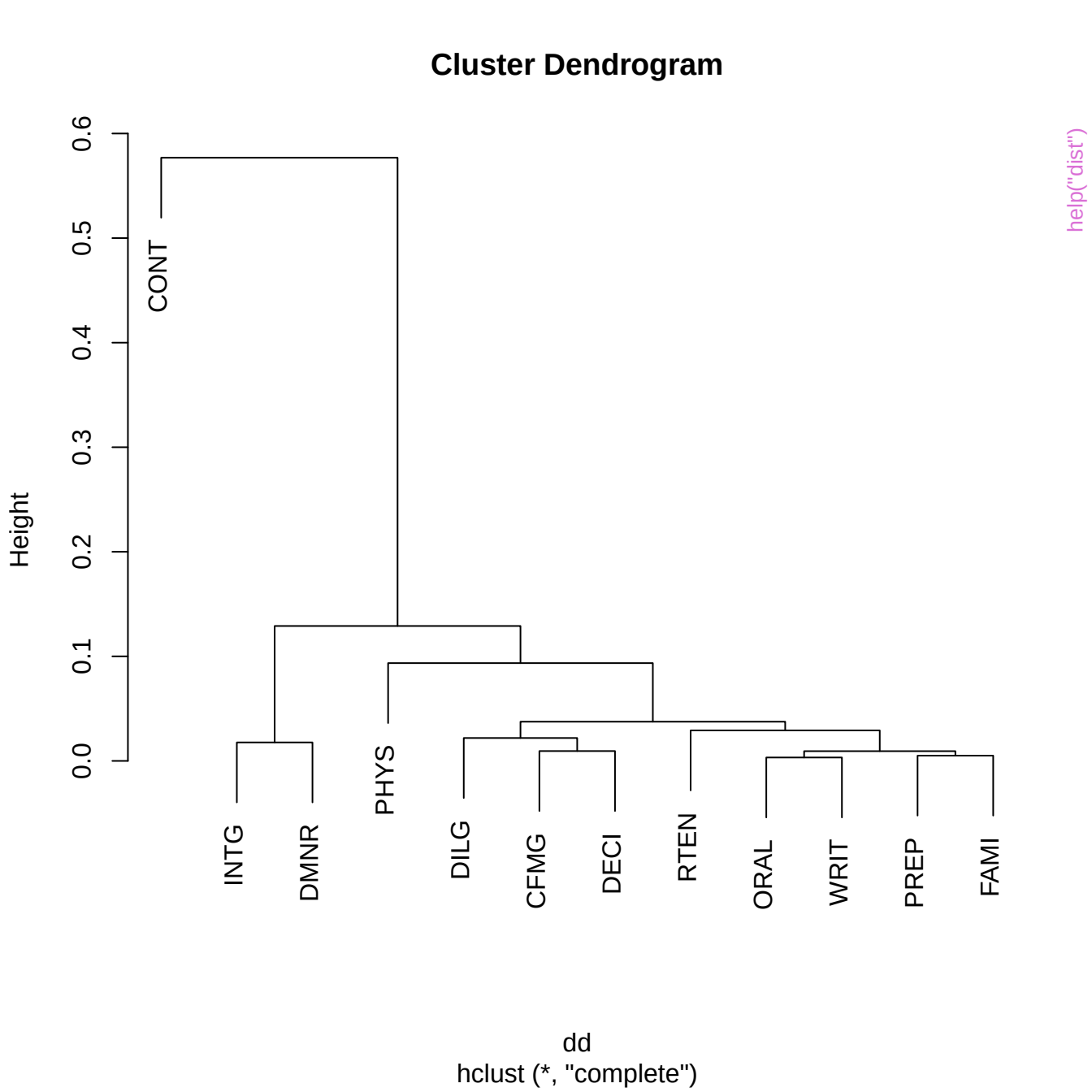

density.default(x = xx)
Density
0.0
0.1
0.2
0.3
0.4
0.5
1
2
3
4
5
6
N = 272 Bandwidth = 0.3348
help("density")

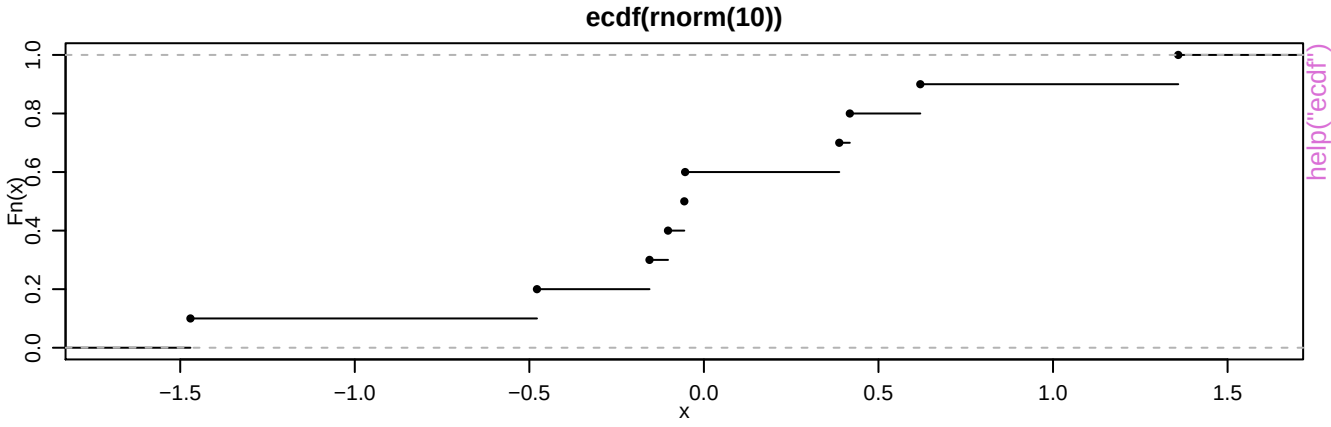

R's density() kernels with bw = 1
Density
0.0
0.1
0.2
0.3
0.4
−3
−2
−1
0
1
2
3
gaussian
epanechnikov
rectangular
triangular
biweight
cosine
optcosine
help("density")

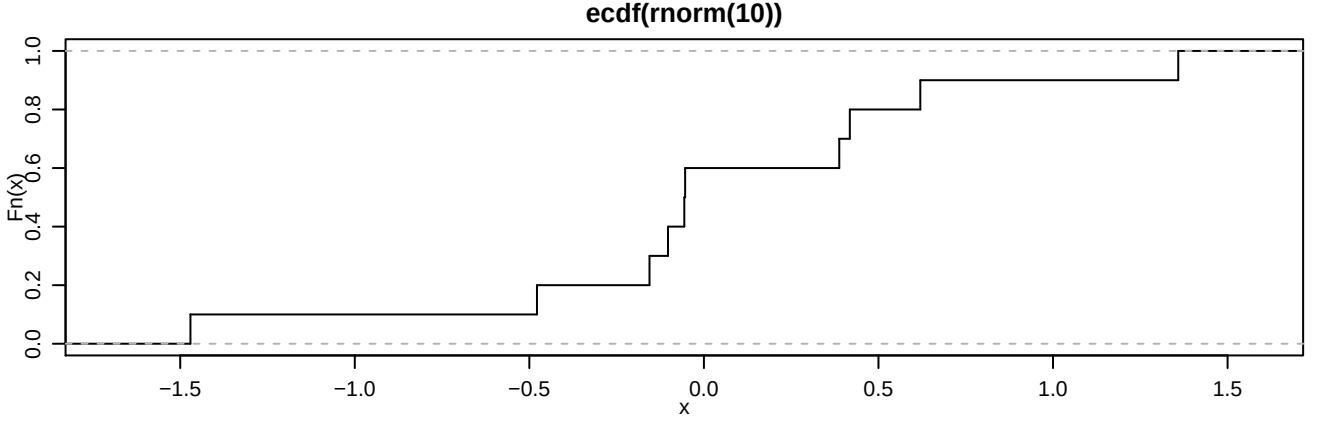

R's density() kernels with width = 1
gaussian
epanechniko
rectangular
triangular
biweight
cosine
optcosine
Density
0.0
0.2
0.4
0.6
0.8
1.0
−1.0
−0.5
0.0
0.5
1.0
help("density")

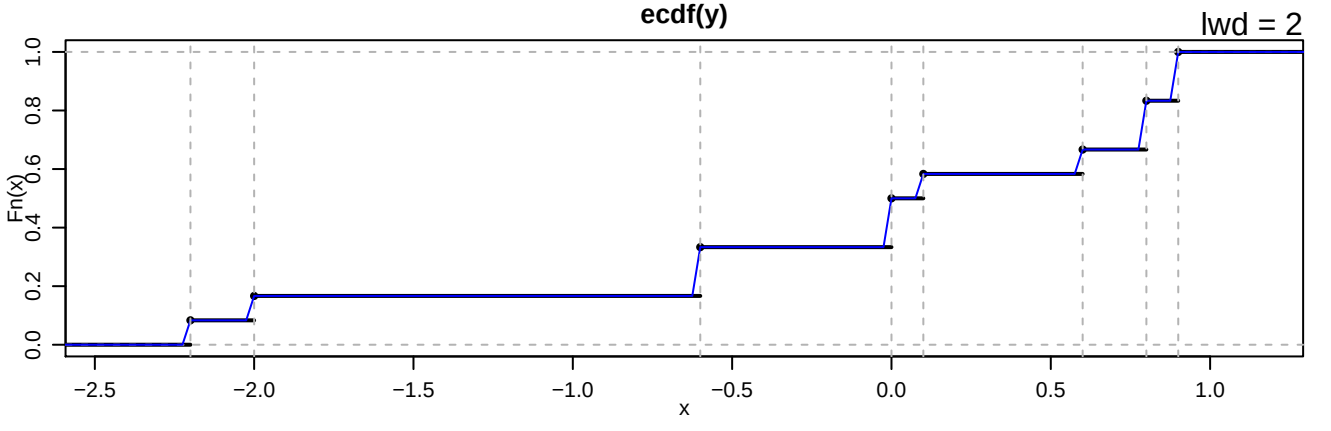

same sd bandwidths, 7 different kernels
Density
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0
20
40
60
80
N = 70 Bandwidth = 3.932
help("density")

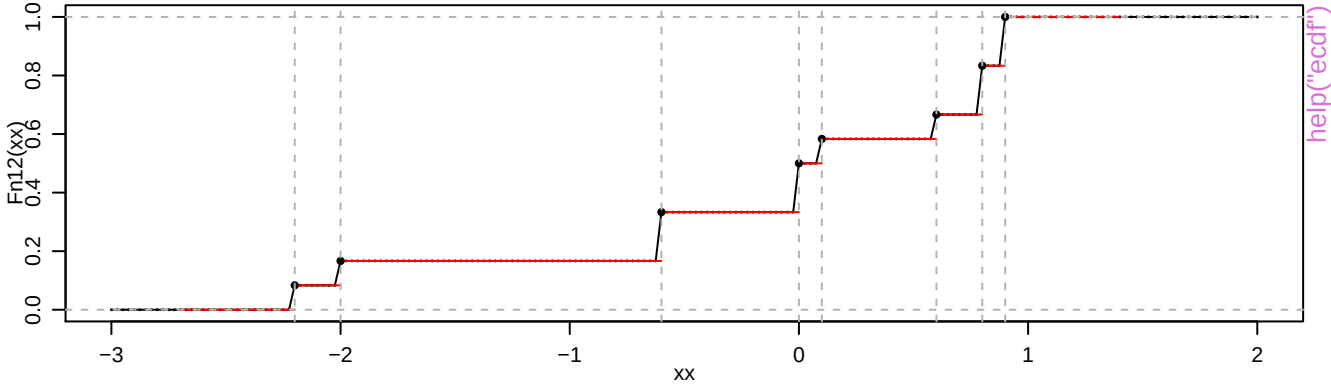

equivalent bandwidths, 7 different kernels
Density
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0
20
40
60
80
N = 70 Bandwidth = 3.932
gaussian
epanechnikov
rectangular
triangular
biweight
cosine
optcosine
help("density")

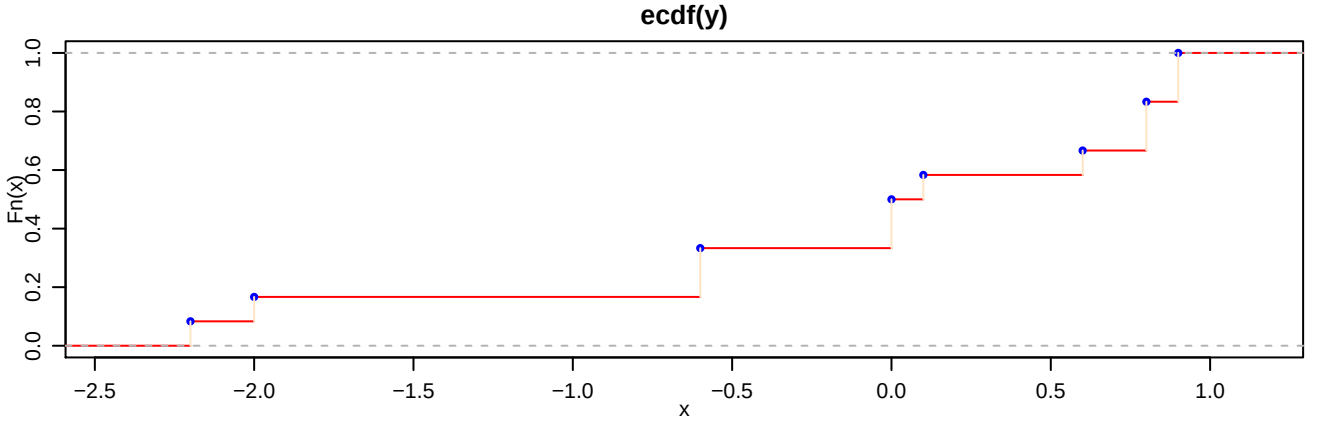

Cluster Dendrogram
Height
0.0
0.1
0.2
0.3
0.4
0.5
0.6
CONT
INTG
DMNR
PHYS
DILG
CFMG
DECI
RTEN
ORAL
WRIT
PREP
FAMI
dd
hclust (*, "complete")
help("dist")

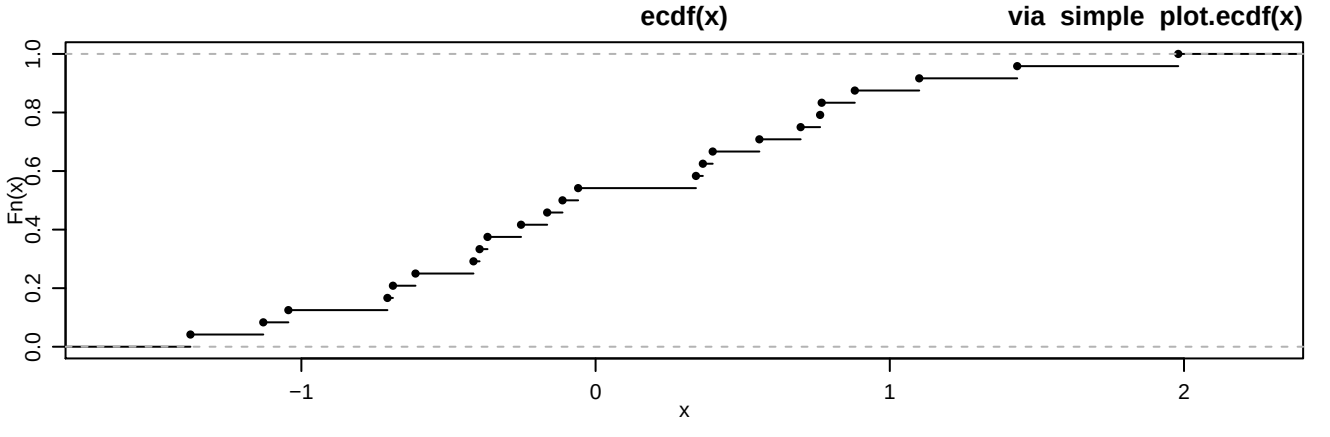

ecdf(rnorm(10))
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5
x
help("ecdf")

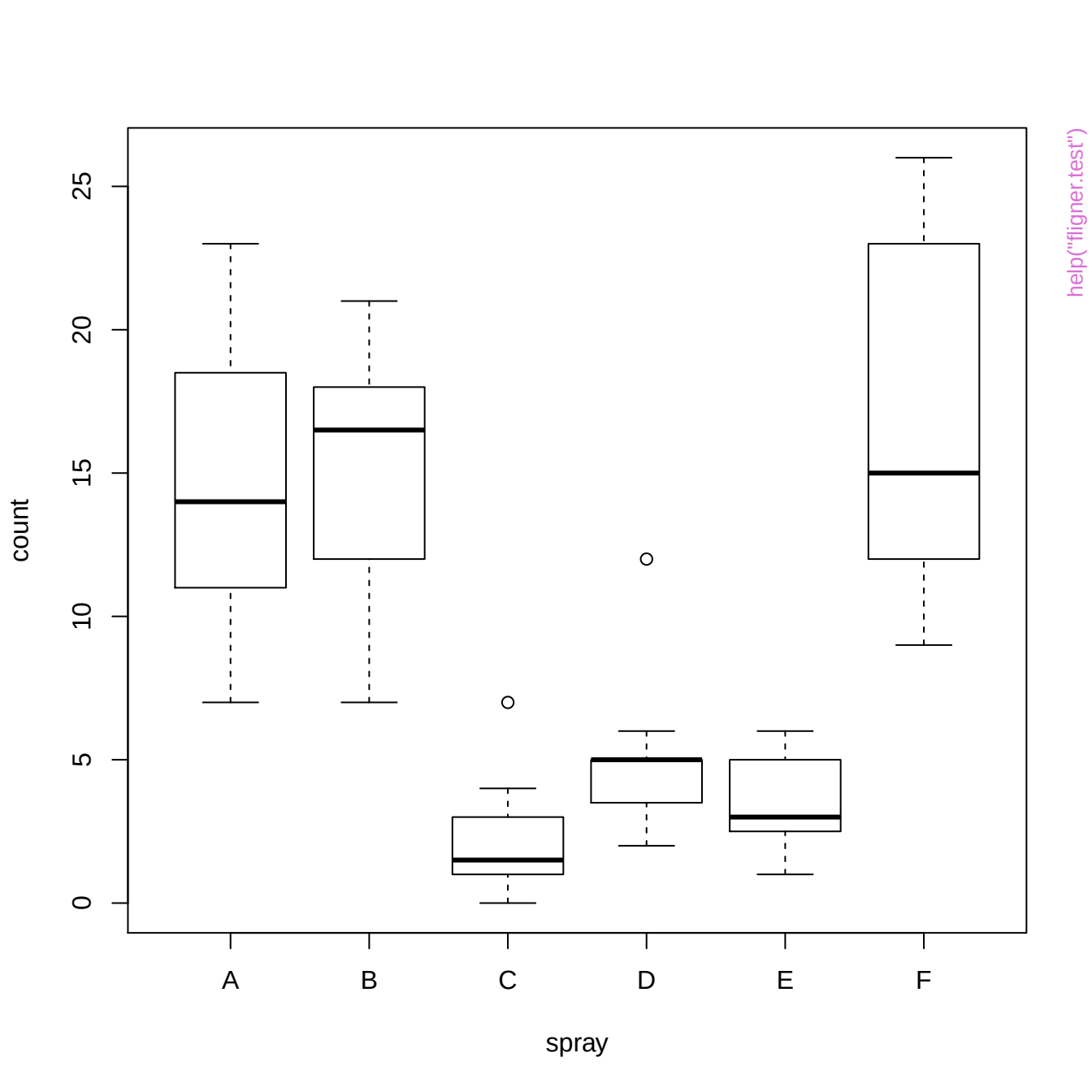

ecdf(rnorm(10))
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5
x

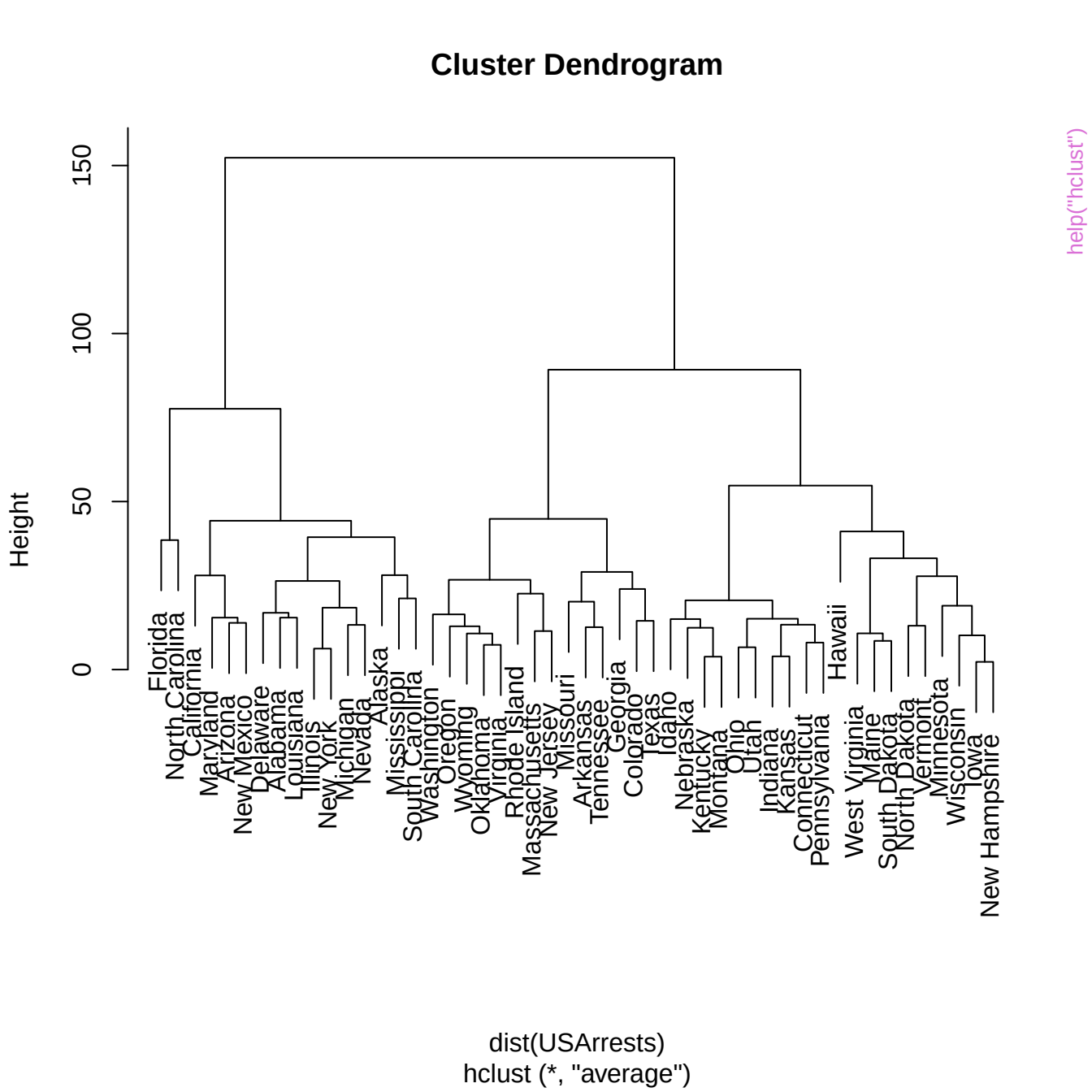

ecdf(y)
lwd = 2
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−2.5
−2.0
−1.5
−1.0
−0.5
0.0
0.5
1.0
x

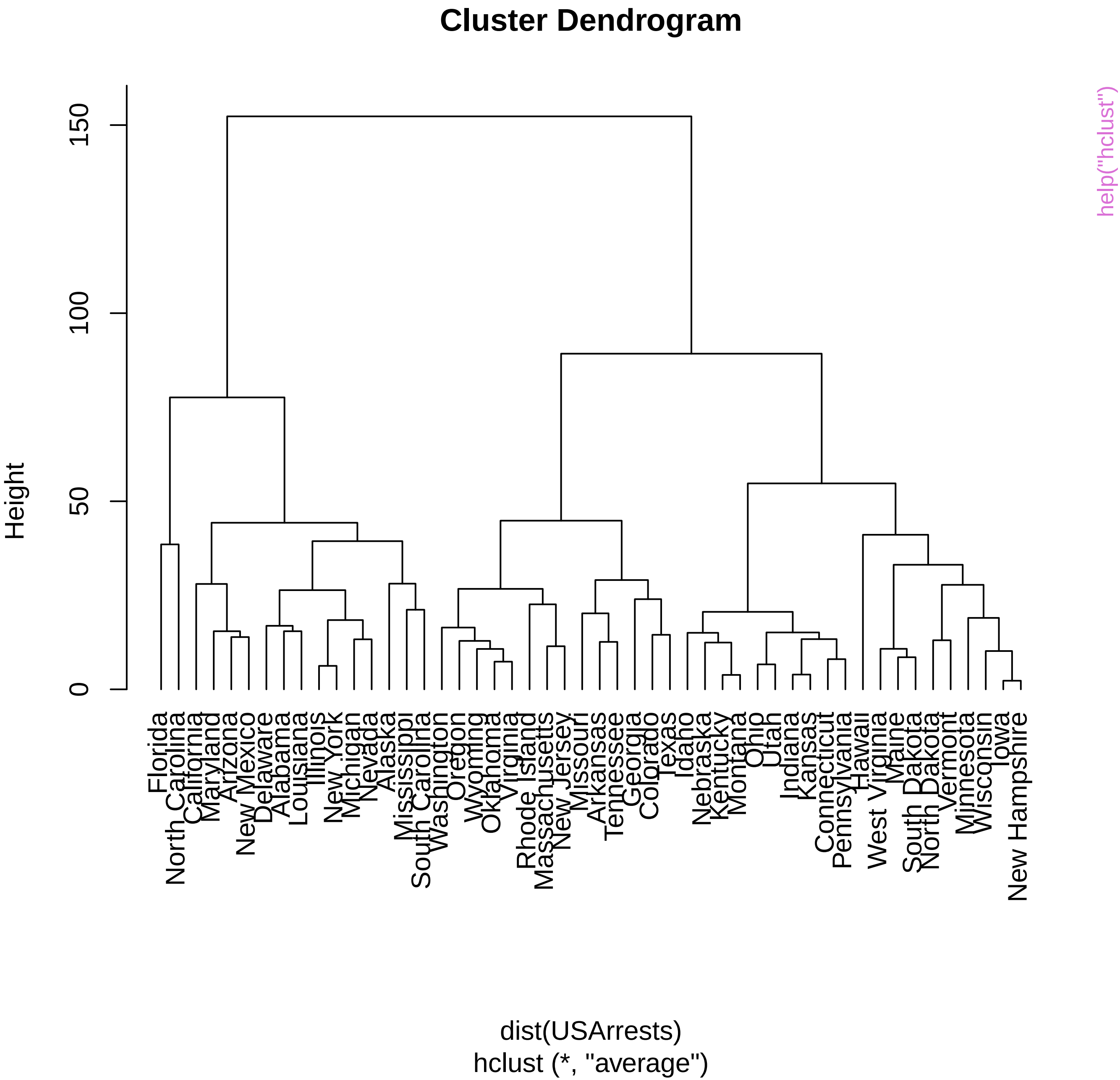

Fn12(xx)
0.0
0.2
0.4
0.6
0.8
1.0
−3
−2
−1
0
1
2
xx
help("ecdf")

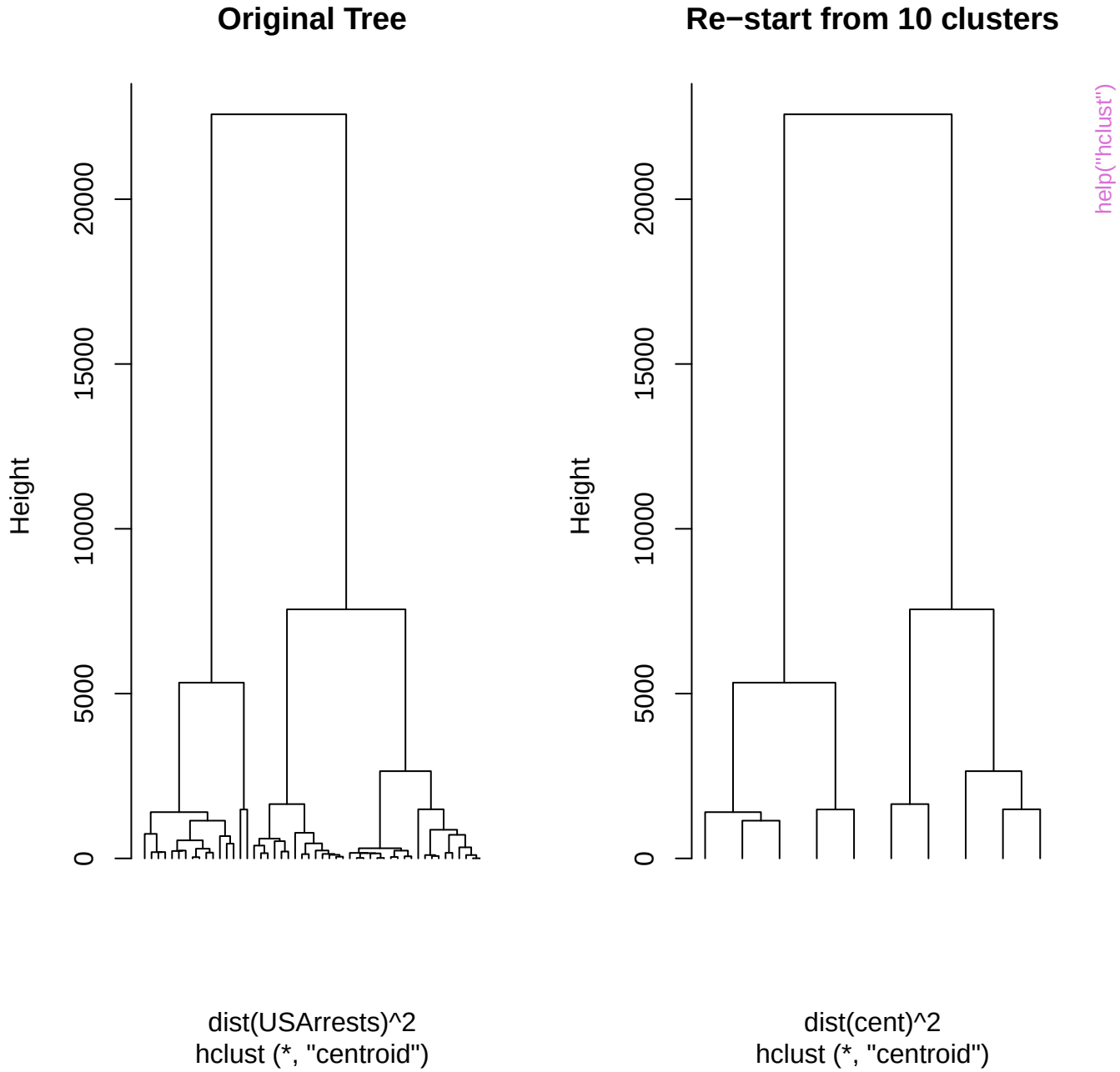

ecdf(y)
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−2.5
−2.0
−1.5
−1.0
−0.5
0.0
0.5
1.0
x

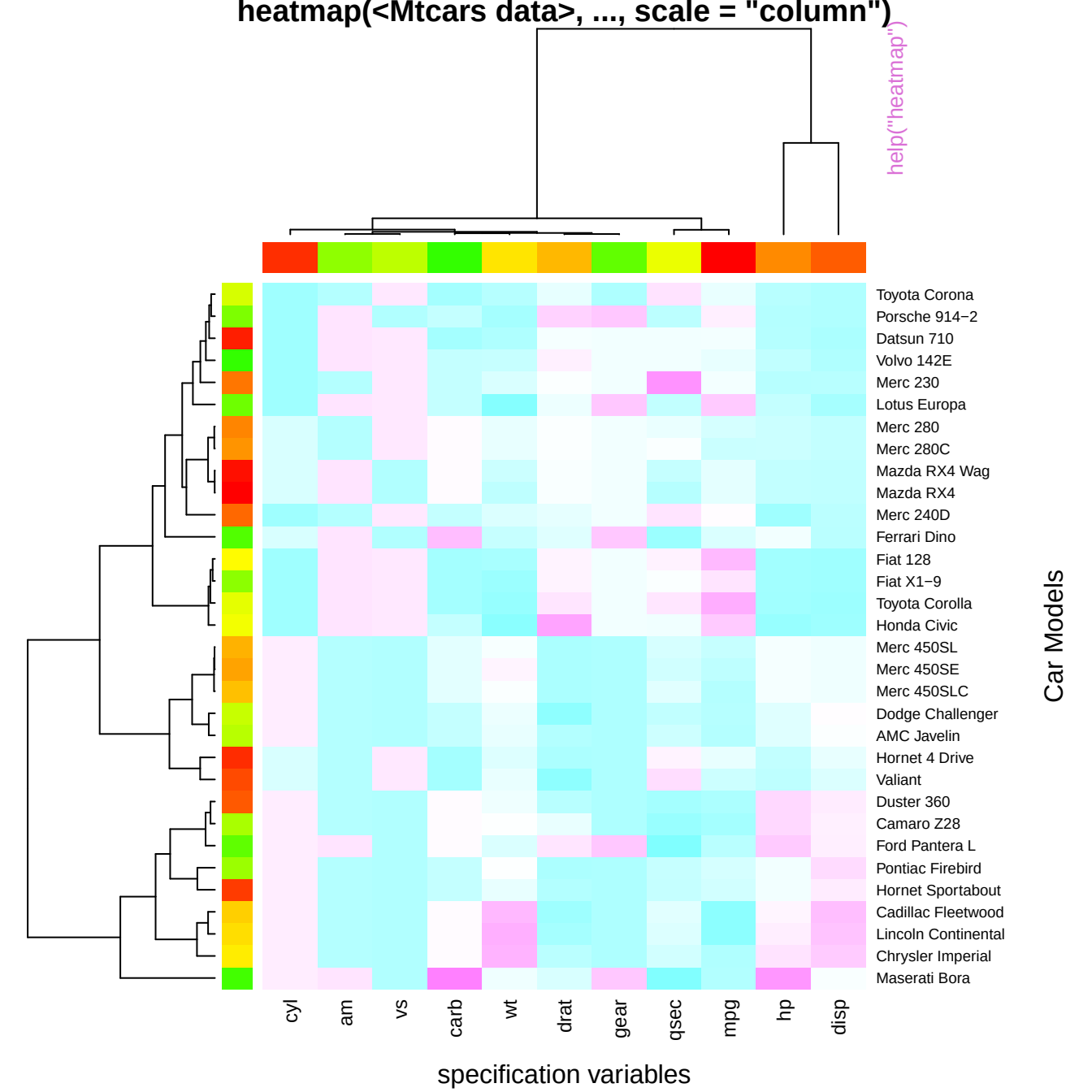

ecdf(x)
via simple plot.ecdf(x)
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−1
0
1
2
x

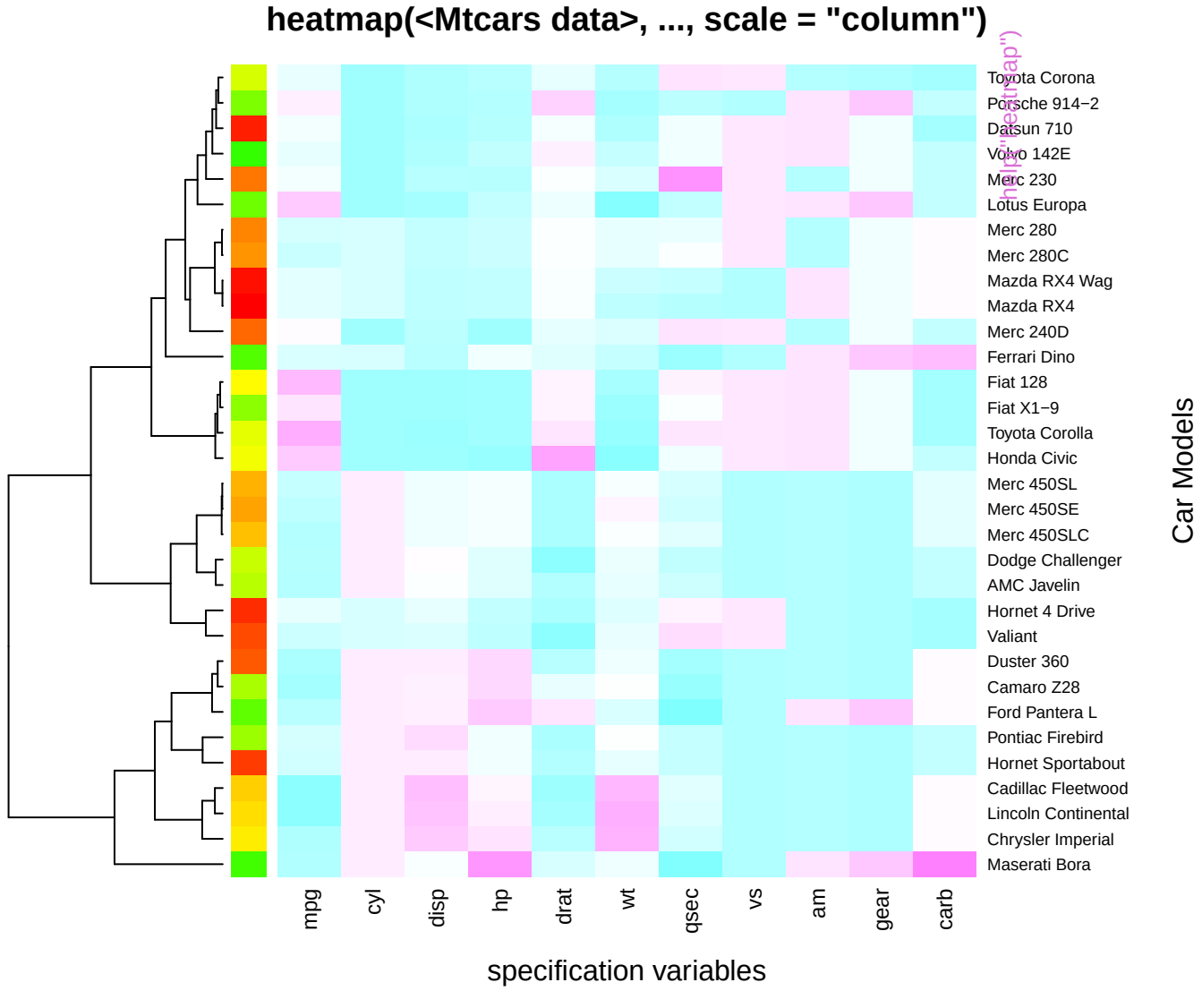

count
0
5
10
15
20
25
A
B
C
D
E
F
spray
help("fligner.test")

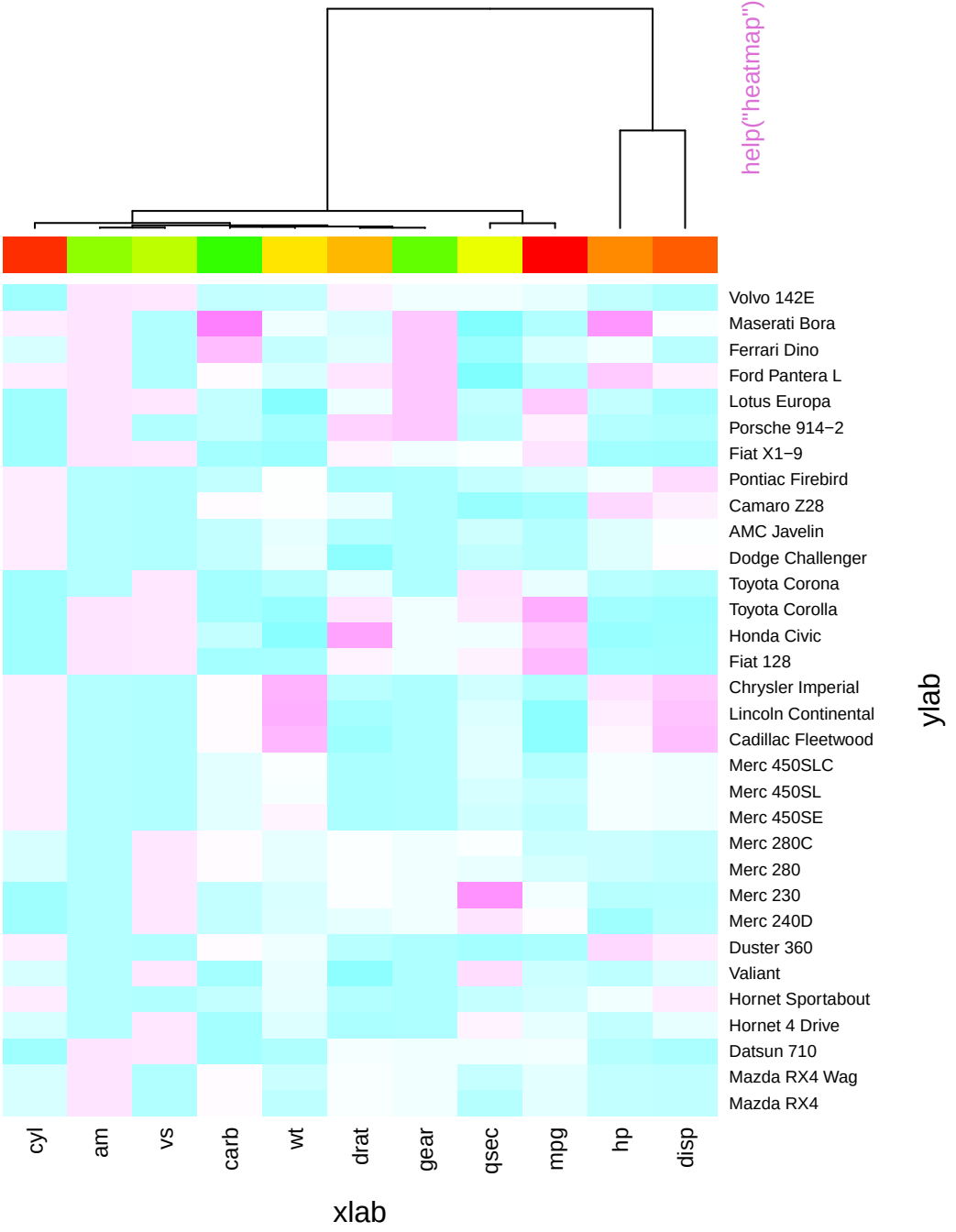

Cluster Dendrogram
Height
0
50
100
150
Florida
North Carolina
California
Maryland
Arizona
New Mexico
Delaware
Alabama
Louisiana
Illinois
New York
Michigan
Nevada
Alaska
Mississippi
South Carolina
Washington
Oregon
Wyoming
Oklahoma
Virginia
Rhode Island
Massachusetts
New Jersey
Missouri
Arkansas
Tennessee
Georgia
Colorado
Texas
Idaho
Nebraska
Kentucky
Montana
Ohio
Utah
Indiana
Kansas
Connecticut
Pennsylvania
Hawaii
West Virginia
Maine
South Dakota
North Dakota
Vermont
Minnesota
Wisconsin
Iowa
New Hampshire
dist(USArrests)
hclust (*, "average")
help("hclust")

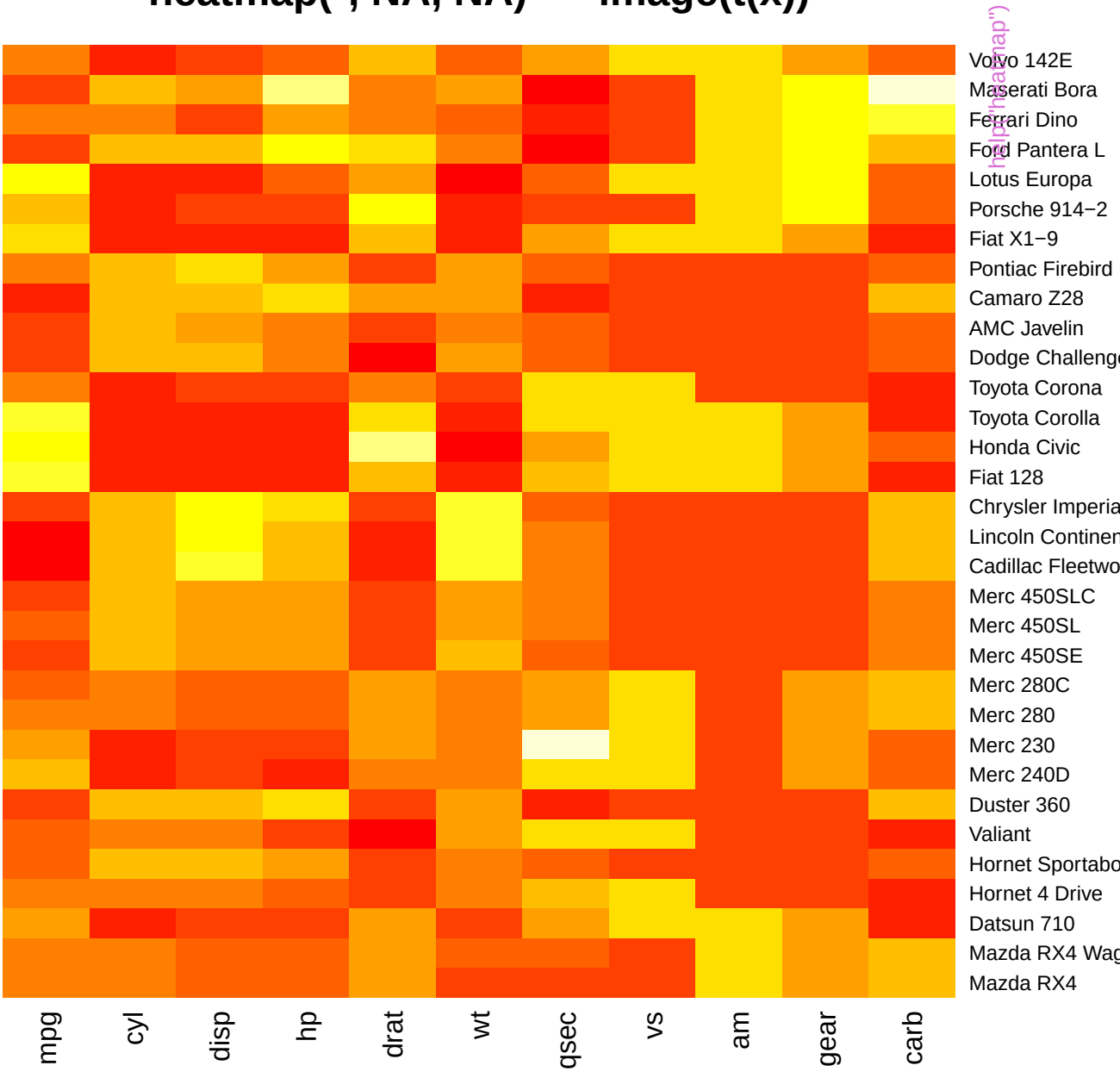

Cluster Dendrogram
Height
0
50
100
150
Florida
North Carolina
California
Maryland
Arizona
New Mexico
Delaware
Alabama
Louisiana
Illinois
New York
Michigan
Nevada
Alaska
Mississippi
South Carolina
Washington
Oregon
Wyoming
Oklahoma
Virginia
Rhode Island
Massachusetts
New Jersey
Missouri
Arkansas
Tennessee
Georgia
Colorado
Texas
Idaho
Nebraska
Kentucky
Montana
Ohio
Utah
Indiana
Kansas
Connecticut
Pennsylvania
Hawaii
West Virginia
Maine
South Dakota
North Dakota
Vermont
Minnesota
Wisconsin
Iowa
New Hampshire
dist(USArrests)
hclust (*, "average")
help("hclust")

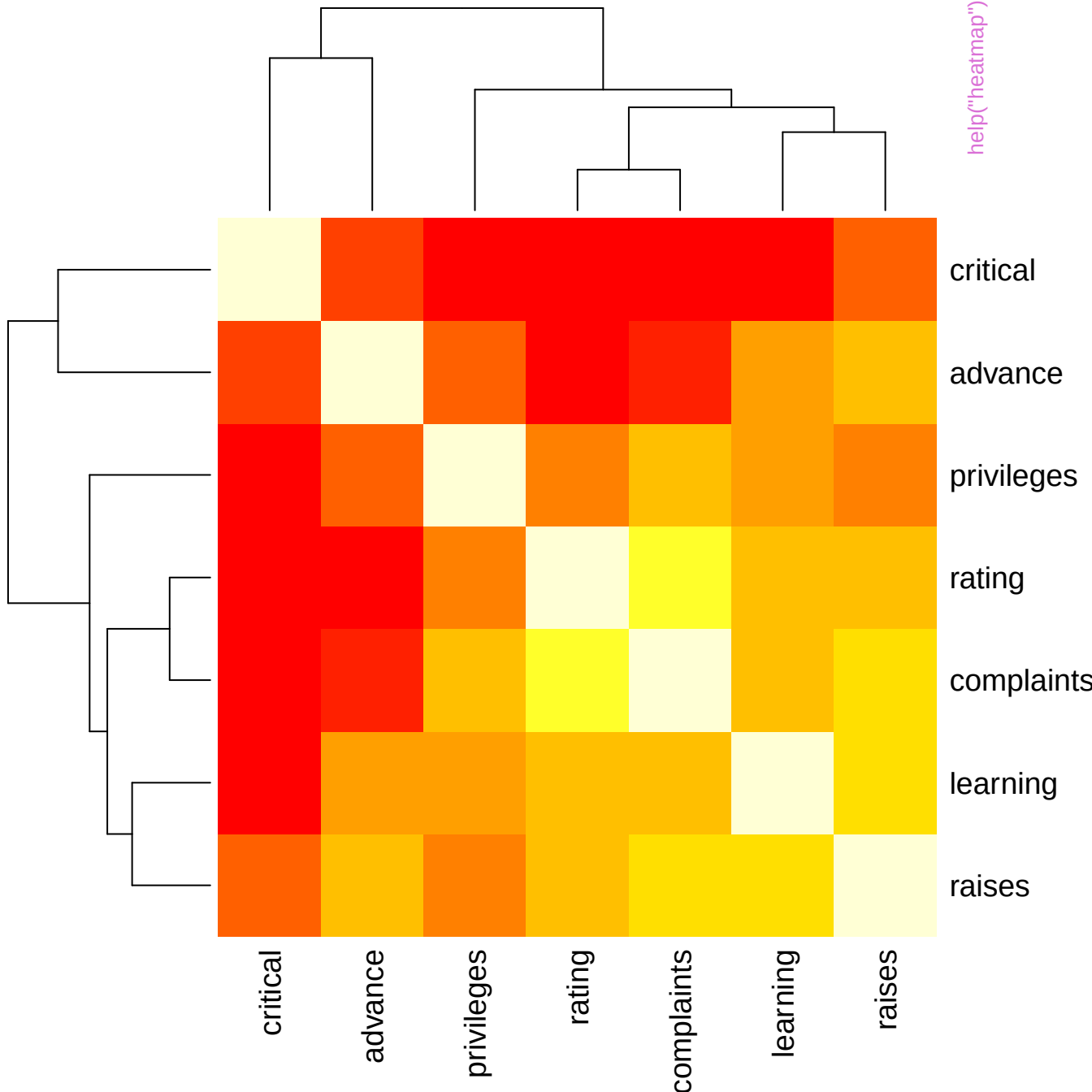

Original Tree
Re−start from 10 clusters
Height
0
5000
10000
15000
20000
dist(USArrests)^2
hclust (*, "centroid")
dist(cent)^2
hclust (*, "centroid")
help("hclust")

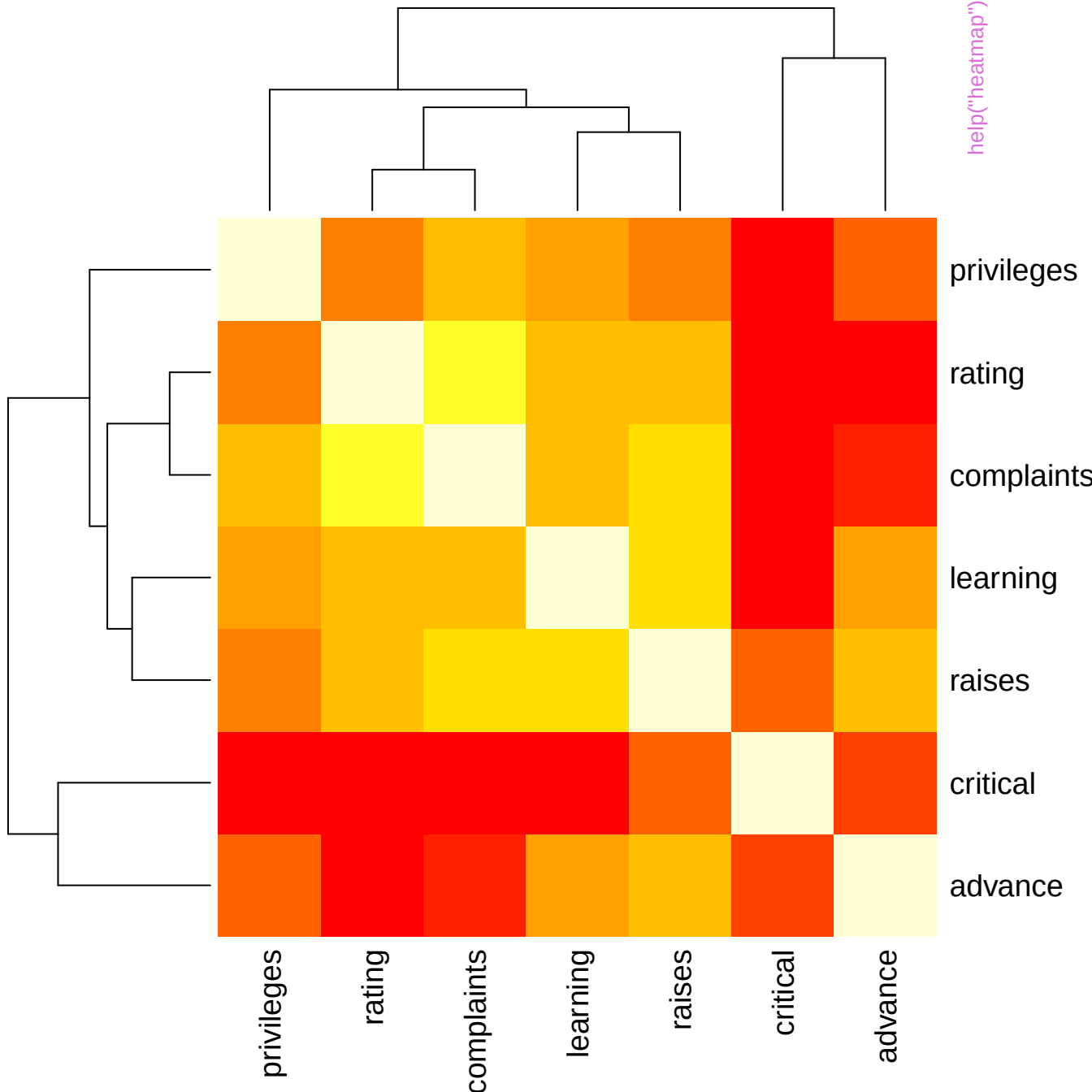

heatmap(<Mtcars data>, ..., scale = "column")
help("heatmap")
Toyota Corona
Porsche 914−2
Datsun 710
Volvo 142E
Merc 230
Lotus Europa
Merc 280
Merc 280C
Mazda RX4 Wag
Mazda RX4
Merc 240D
Ferrari Dino
Fiat 128
Fiat X1−9
Toyota Corolla
Honda Civic
Merc 450SL
Merc 450SE
Merc 450SLC
Dodge Challenger
AMC Javelin
Hornet 4 Drive
Valiant
Duster 360
Camaro Z28
Ford Pantera L
Pontiac Firebird
Hornet Sportabout
Cadillac Fleetwood
Lincoln Continental
Chrysler Imperial
Maserati Bora
Car Models
cyl
am
vs
carb
wt
drat
gear
qsec
mpg
hp
disp
specification variables

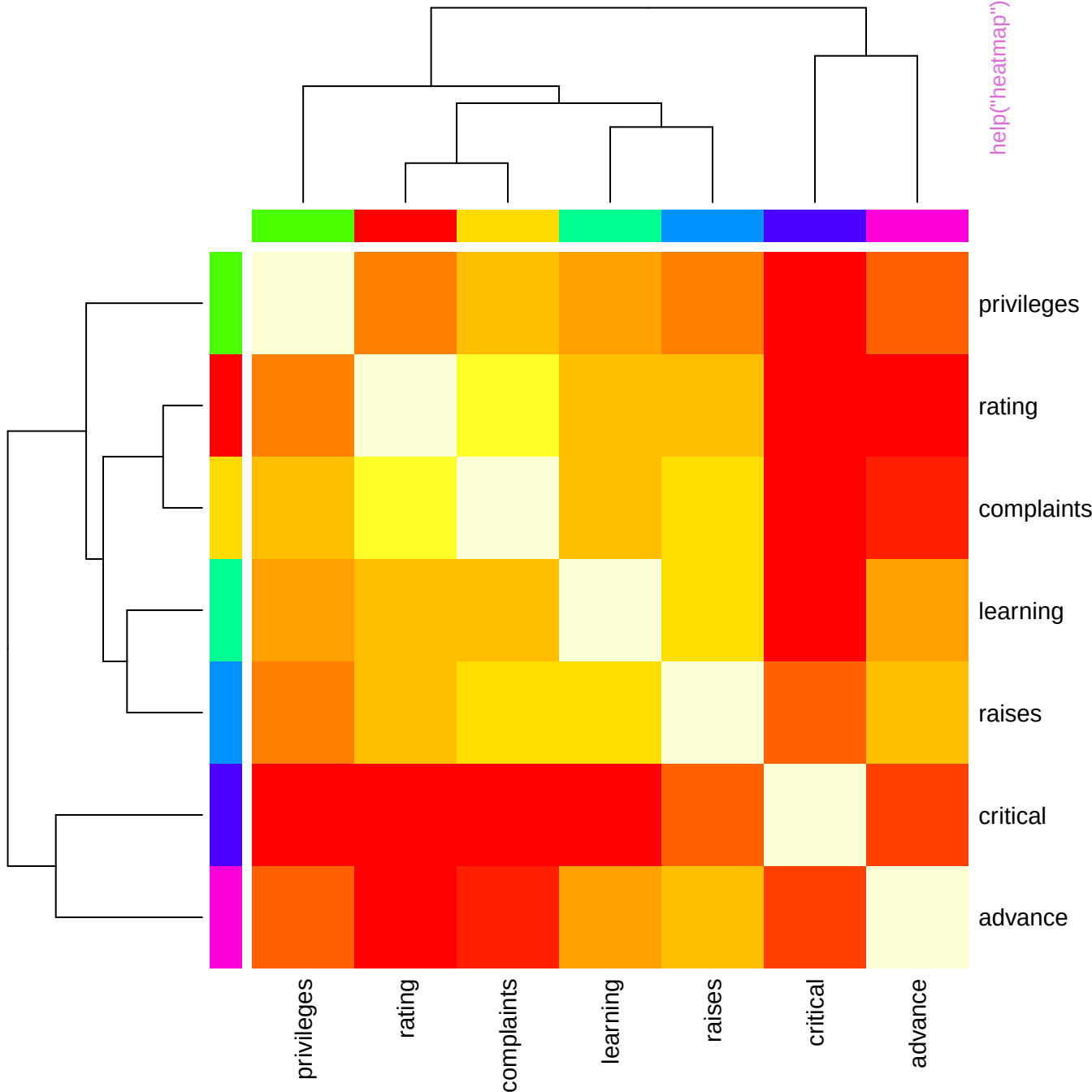

heatmap(<Mtcars data>, ..., scale = "column")
help("heatmap")
Toyota Corona
Porsche 914−2
Datsun 710
Volvo 142E
Merc 230
Lotus Europa
Merc 280
Merc 280C
Mazda RX4 Wag
Mazda RX4
Merc 240D
Ferrari Dino
Fiat 128
Fiat X1−9
Toyota Corolla
Honda Civic
Merc 450SL
Merc 450SE
Merc 450SLC
Dodge Challenger
AMC Javelin
Hornet 4 Drive
Valiant
Duster 360
Camaro Z28
Ford Pantera L
Pontiac Firebird
Hornet Sportabout
Cadillac Fleetwood
Lincoln Continental
Chrysler Imperial
Maserati Bora
Car Models
mpg
cyl
disp
hp
drat
wt
qsec
vs
am
gear
carb
specification variables

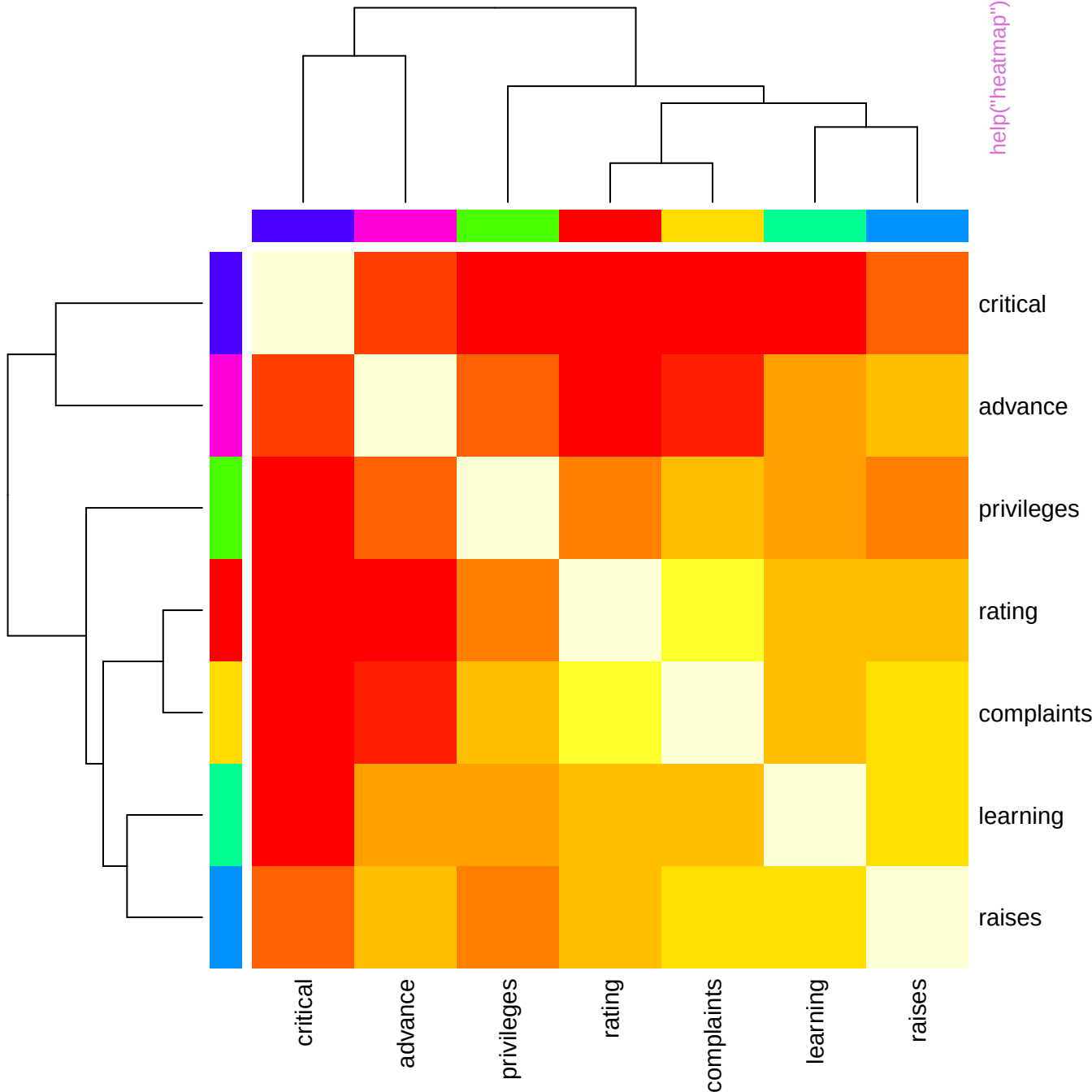

help("heatmap")
Volvo 142E
Maserati Bora
Ferrari Dino
Ford Pantera L
Lotus Europa
Porsche 914−2
Fiat X1−9
Pontiac Firebird
Camaro Z28
AMC Javelin
Dodge Challenger
Toyota Corona
Toyota Corolla
Honda Civic
Fiat 128
Chrysler Imperial
Lincoln Continental
Cadillac Fleetwood
Merc 450SLC
Merc 450SL
Merc 450SE
Merc 280C
Merc 280
Merc 230
Merc 240D
Duster 360
Valiant
Hornet Sportabout
Hornet 4 Drive
Datsun 710
Mazda RX4 Wag
Mazda RX4
cyl
am
vs
carb
wt
drat
gear
qsec
mpg
hp
disp
xlab
ylab

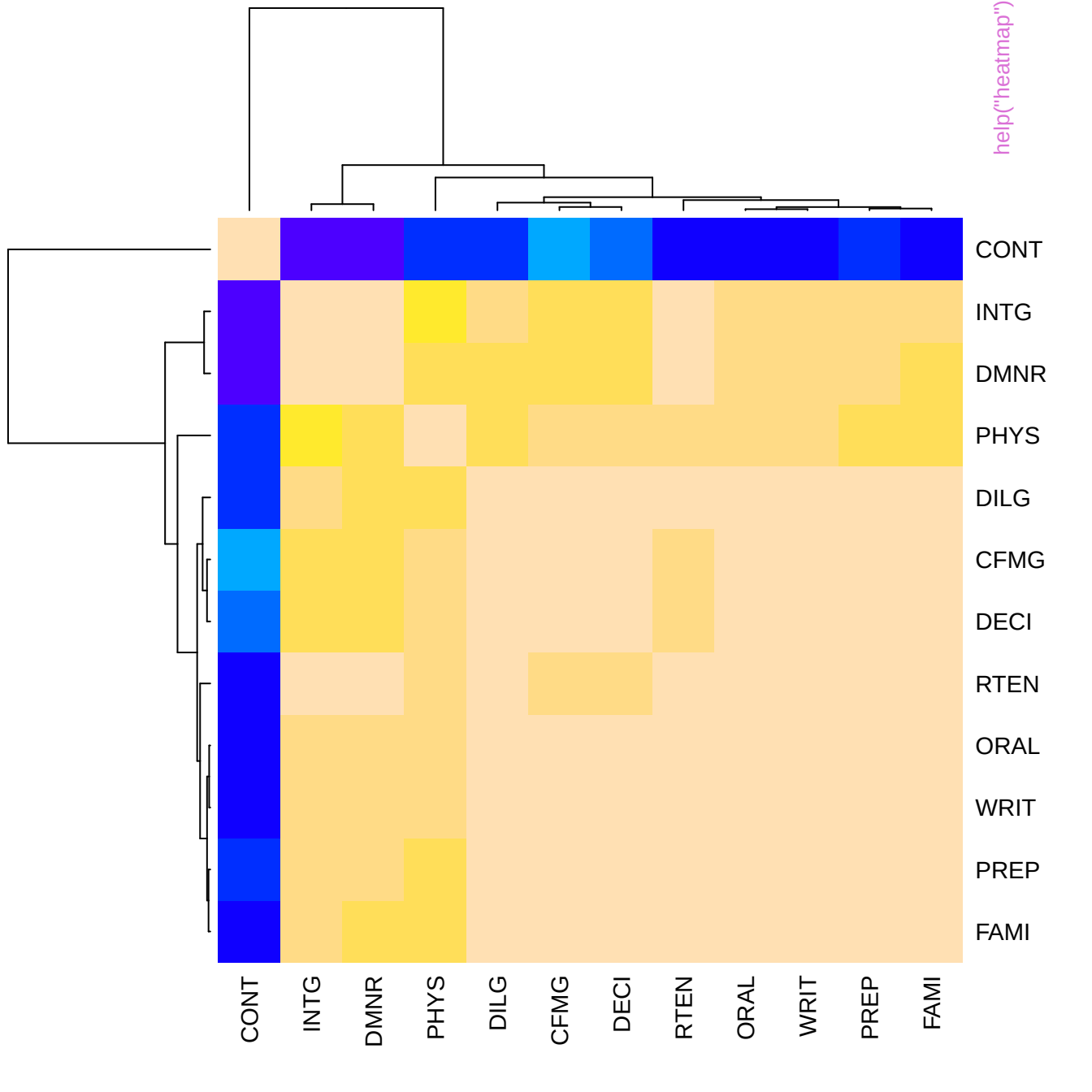

heatmap(*, NA, NA) ~= image(t(x))
Volvo 142E
Maserati Bora
Ferrari Dino
Ford Pantera L
Lotus Europa
Porsche 914−2
Fiat X1−9
Pontiac Firebird
Camaro Z28
AMC Javelin
Dodge Challeng
Toyota Corona
Toyota Corolla
Honda Civic
Fiat 128
Chrysler Imperia
Lincoln Continen
Cadillac Fleetwo
Merc 450SLC
Merc 450SL
Merc 450SE
Merc 280C
Merc 280
Merc 230
Merc 240D
Duster 360
Valiant
Hornet Sportabo
Hornet 4 Drive
Datsun 710
Mazda RX4 Wag
Mazda RX4
mpg
cyl
disp
hp
drat
wt
qsec
vs
am
gear
carb

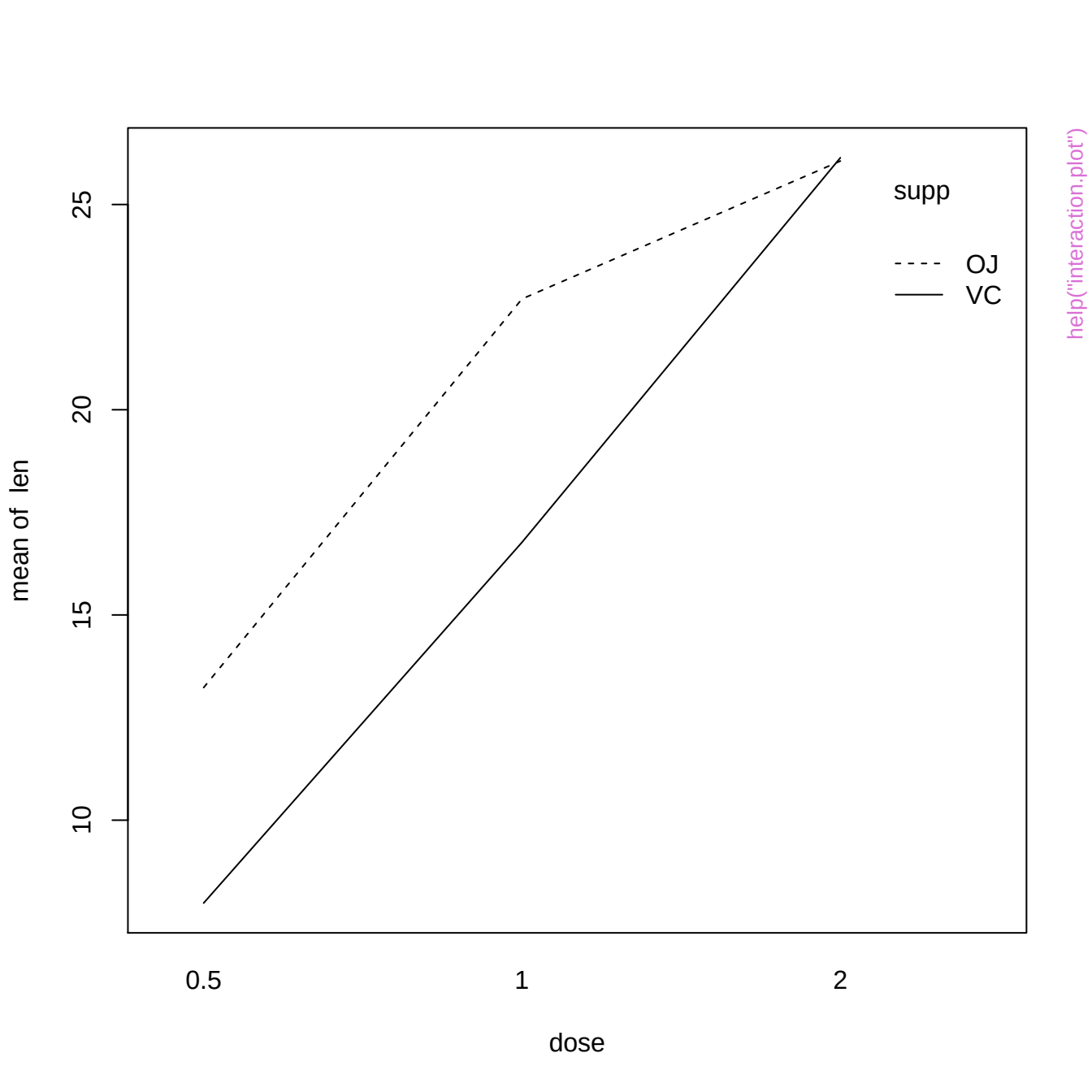

help("heatmap")
critical
advance
privileges
rating
complaints
learning
raises
critical
advance
privileges
rating
complaints
learning
raises

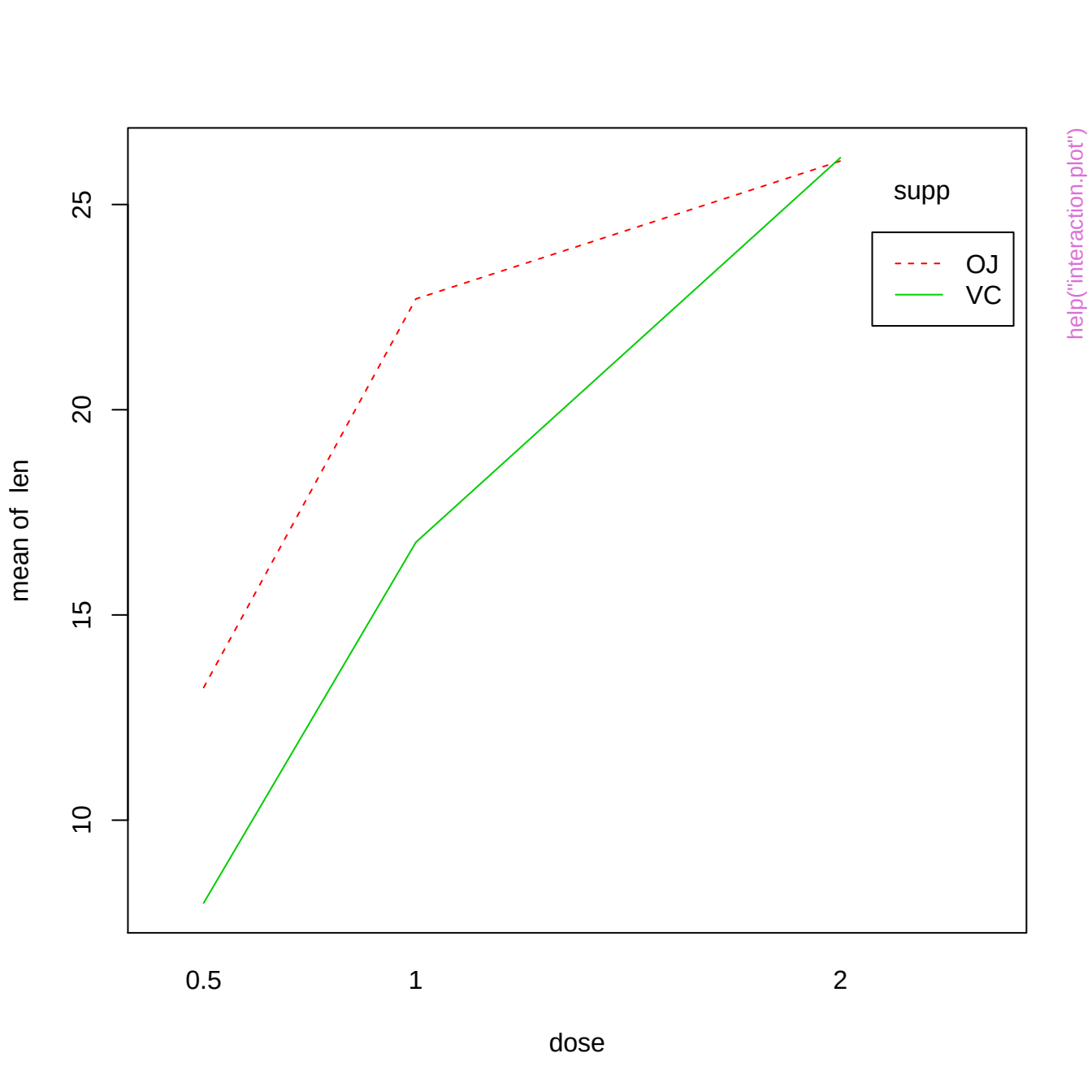

help("heatmap")
privileges
rating
complaints
learning
raises
critical
advance
privileges
rating
complaints
learning
raises
critical
advance

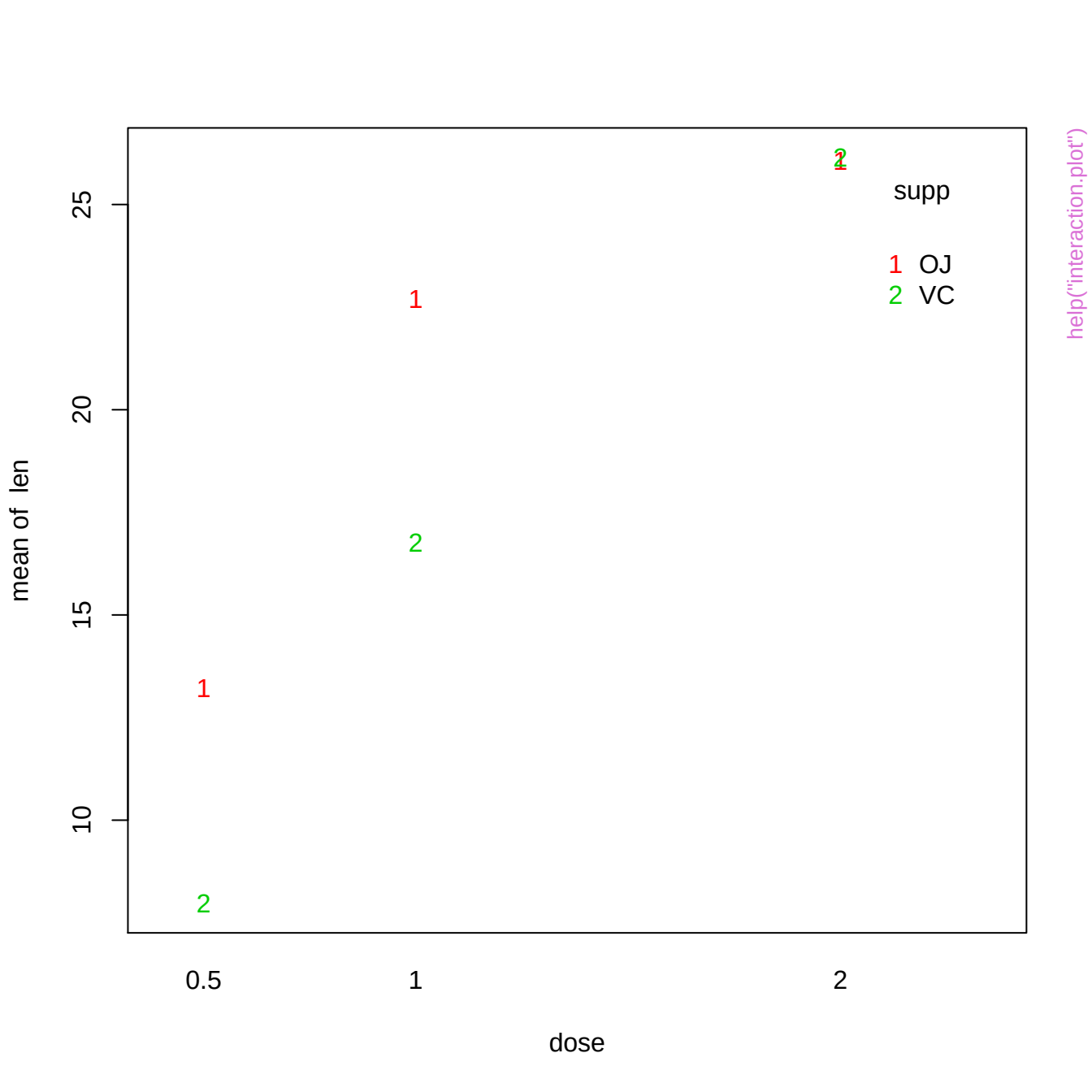

help("heatmap")
privileges
rating
complaints
learning
raises
critical
advance
privileges
rating
complaints
learning
raises
critical
advance

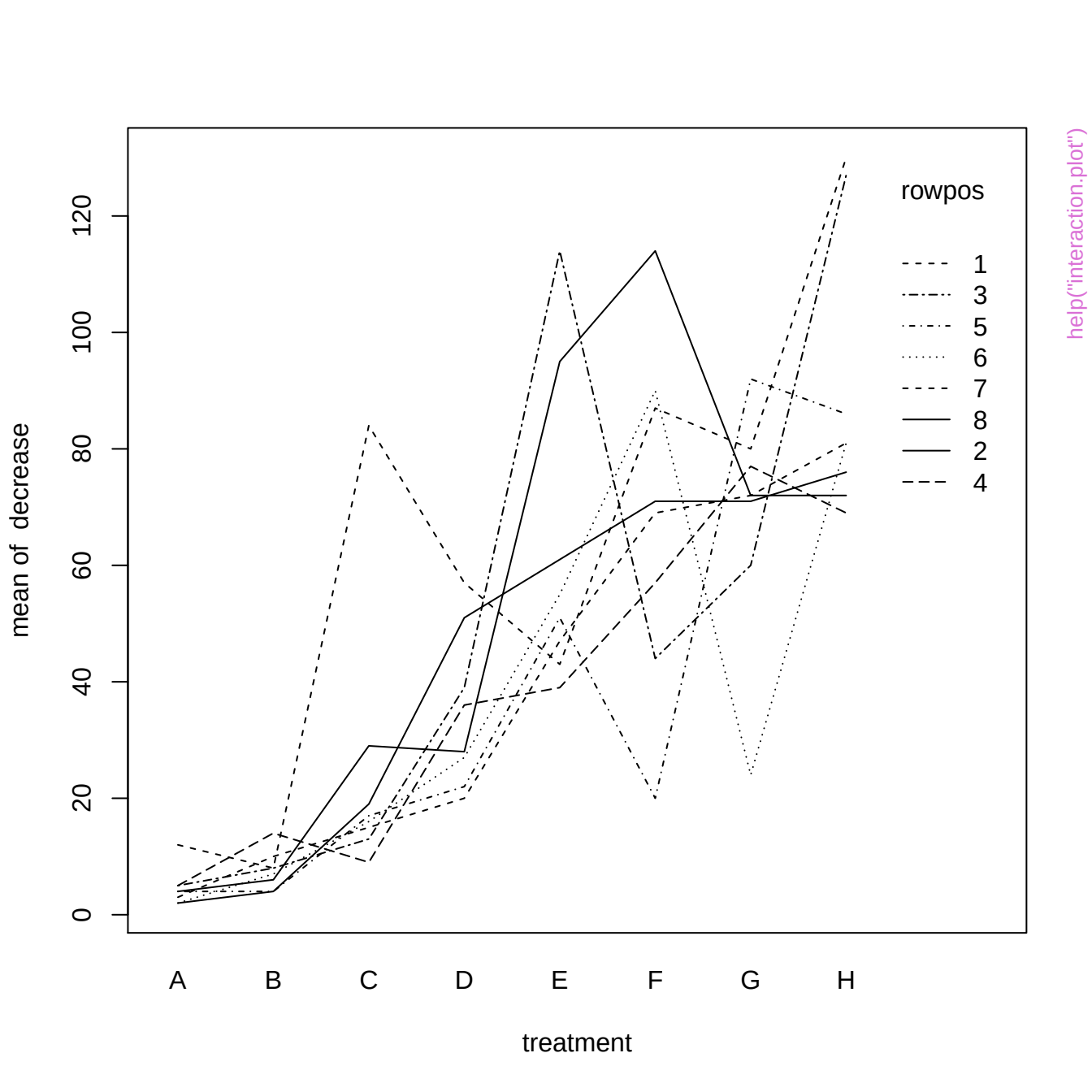

help("heatmap")
critical
advance
privileges
rating
complaints
learning
raises
critical
advance
privileges
rating
complaints
learning
raises

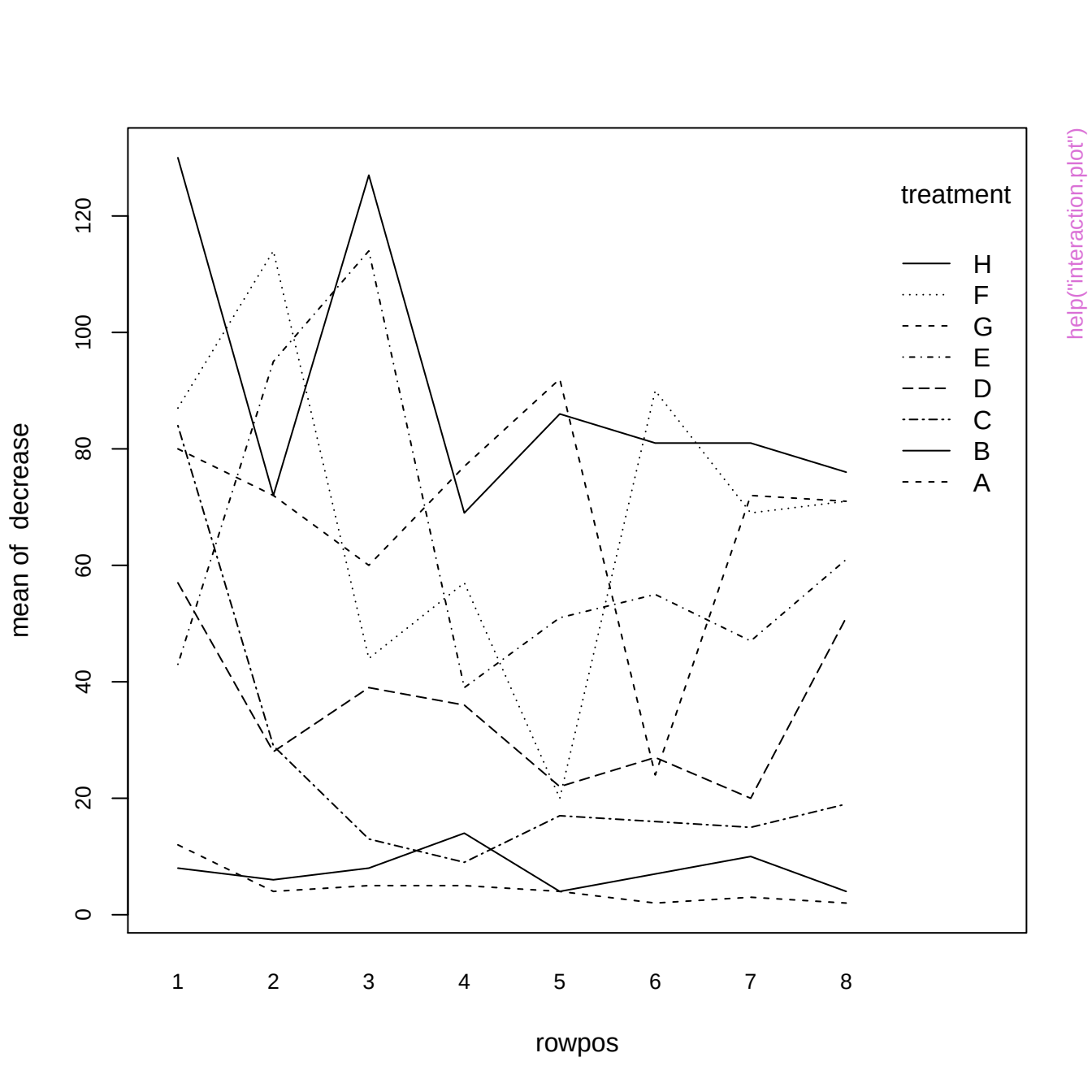

help("heatmap")
CONT
INTG
DMNR
PHYS
DILG
CFMG
DECI
RTEN
ORAL
WRIT
PREP
FAMI
CONT
INTG
DMNR
PHYS
DILG
CFMG
DECI
RTEN
ORAL
WRIT
PREP
FAMI

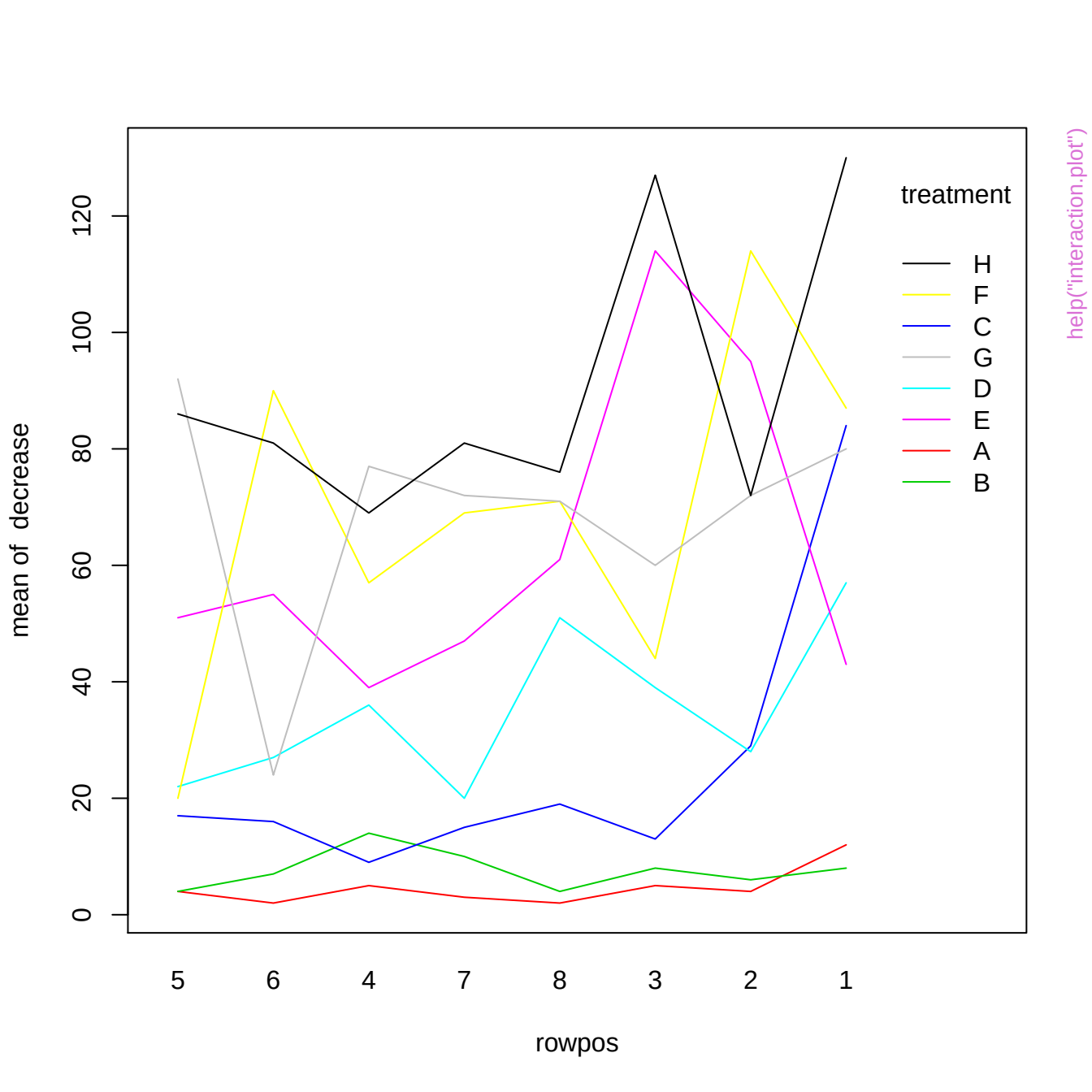

mean of len
25
20
15
10
0.5
1
2
dose
supp
OJ
VC
help("interaction.plot")

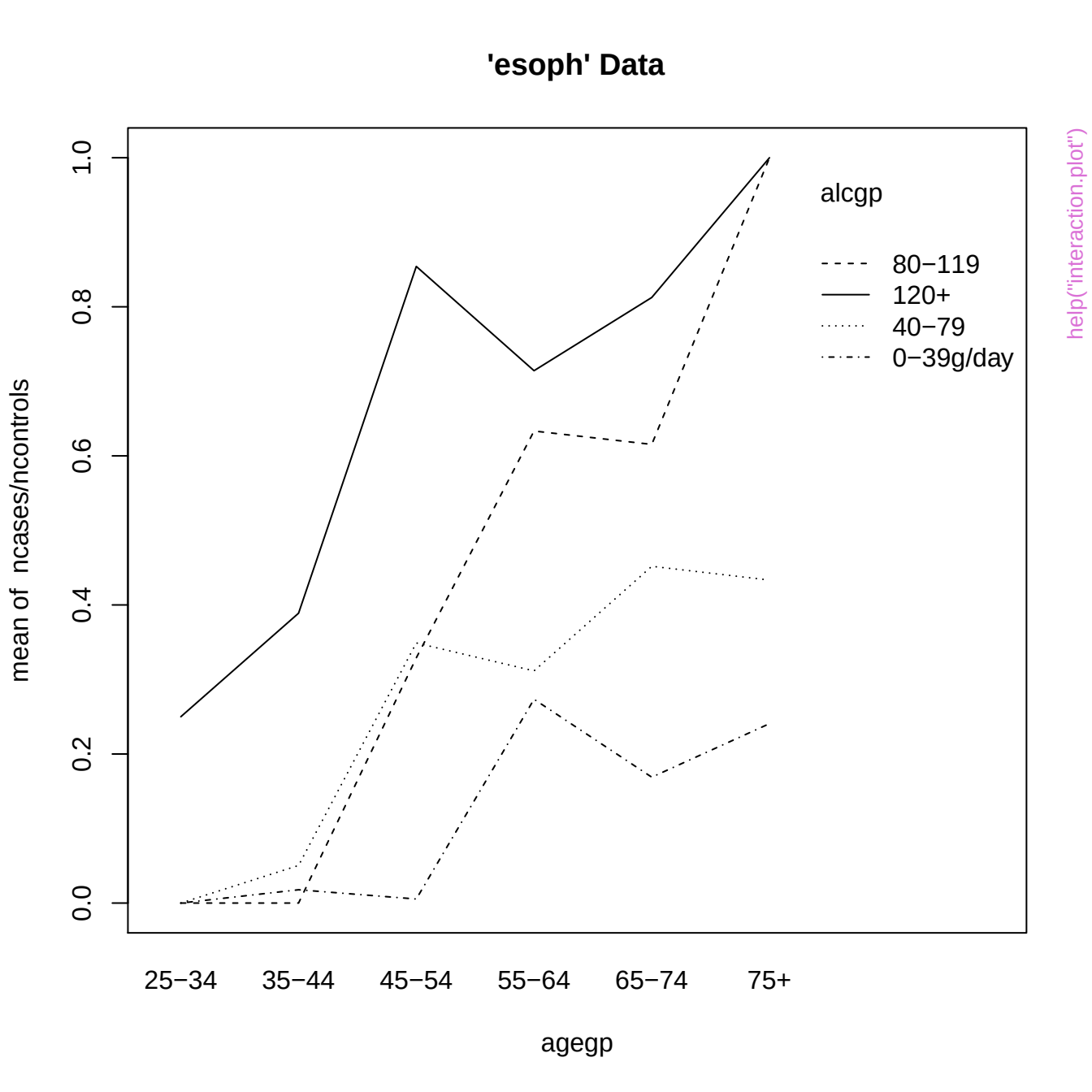

mean of len
10
15
20
25
0.5
1
2
dose
supp
OJ
VC
help("interaction.plot")

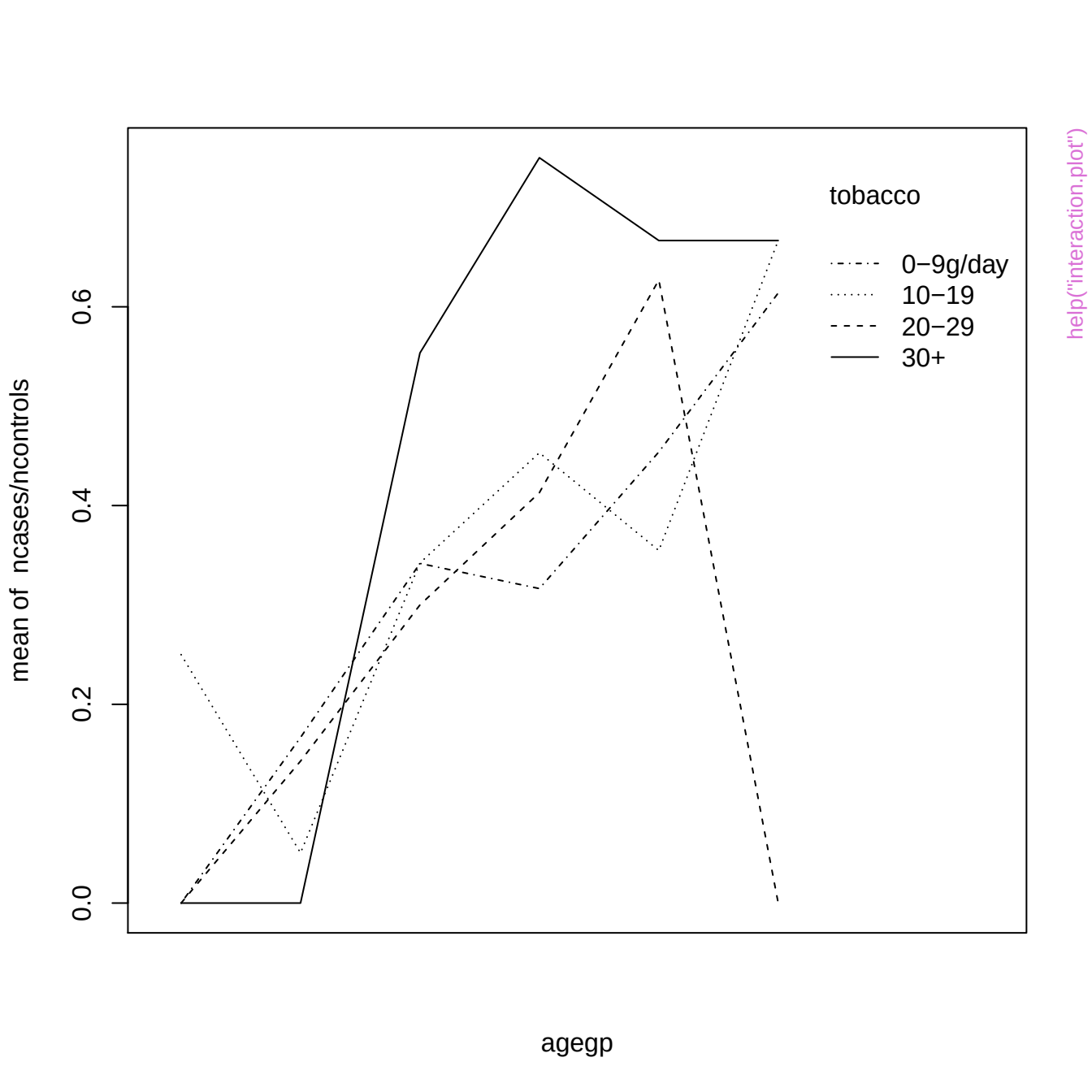

mean of len
25
20
15
10
0.5
1
2
dose
supp
1 OJ
2 VC
help("interaction.plot")

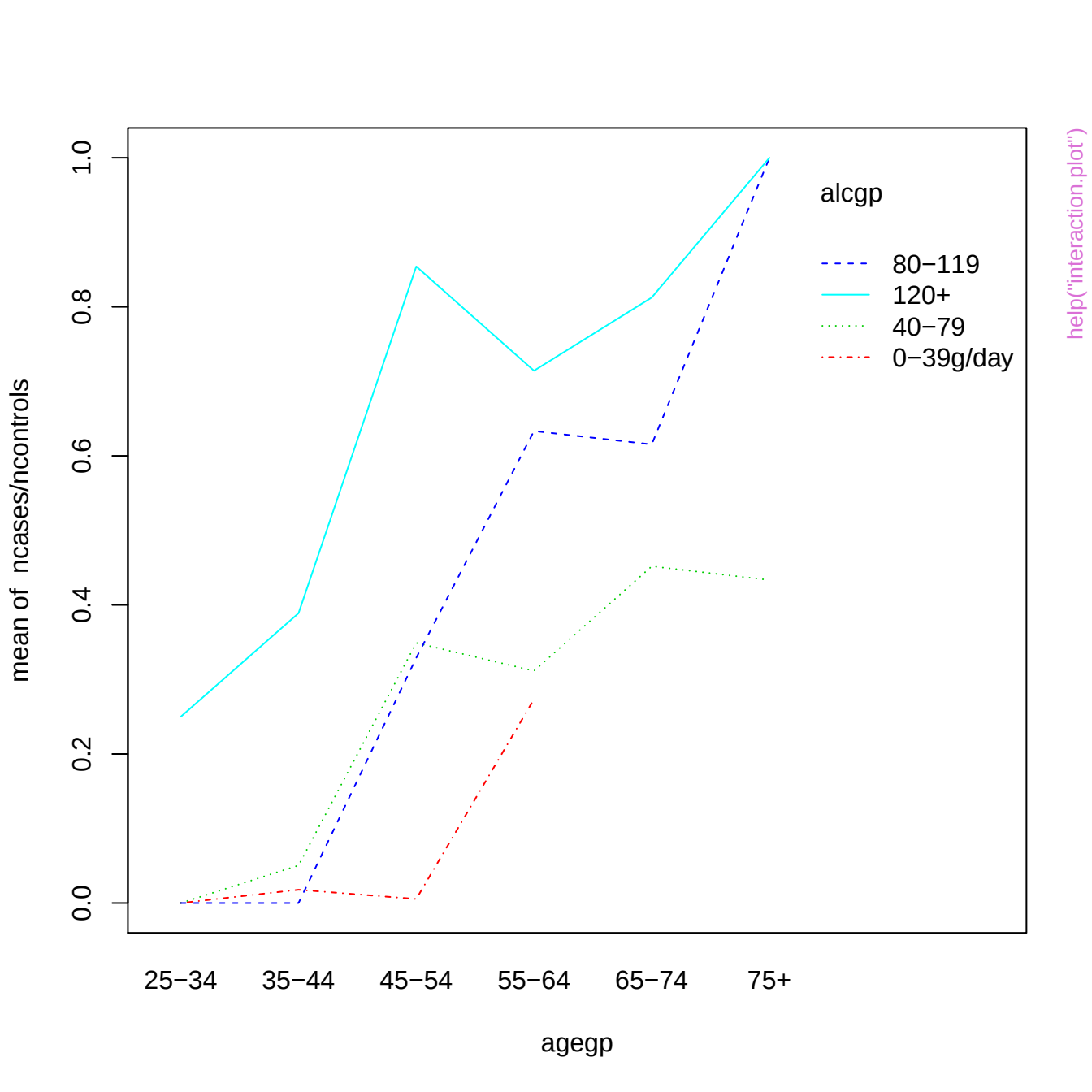

mean of decrease
0
20
40
60
80
100
120
A
B
C
D
E
F
G
H
treatment
rowpos
1
3
5
6
7
8
2
4
help("interaction.plot")

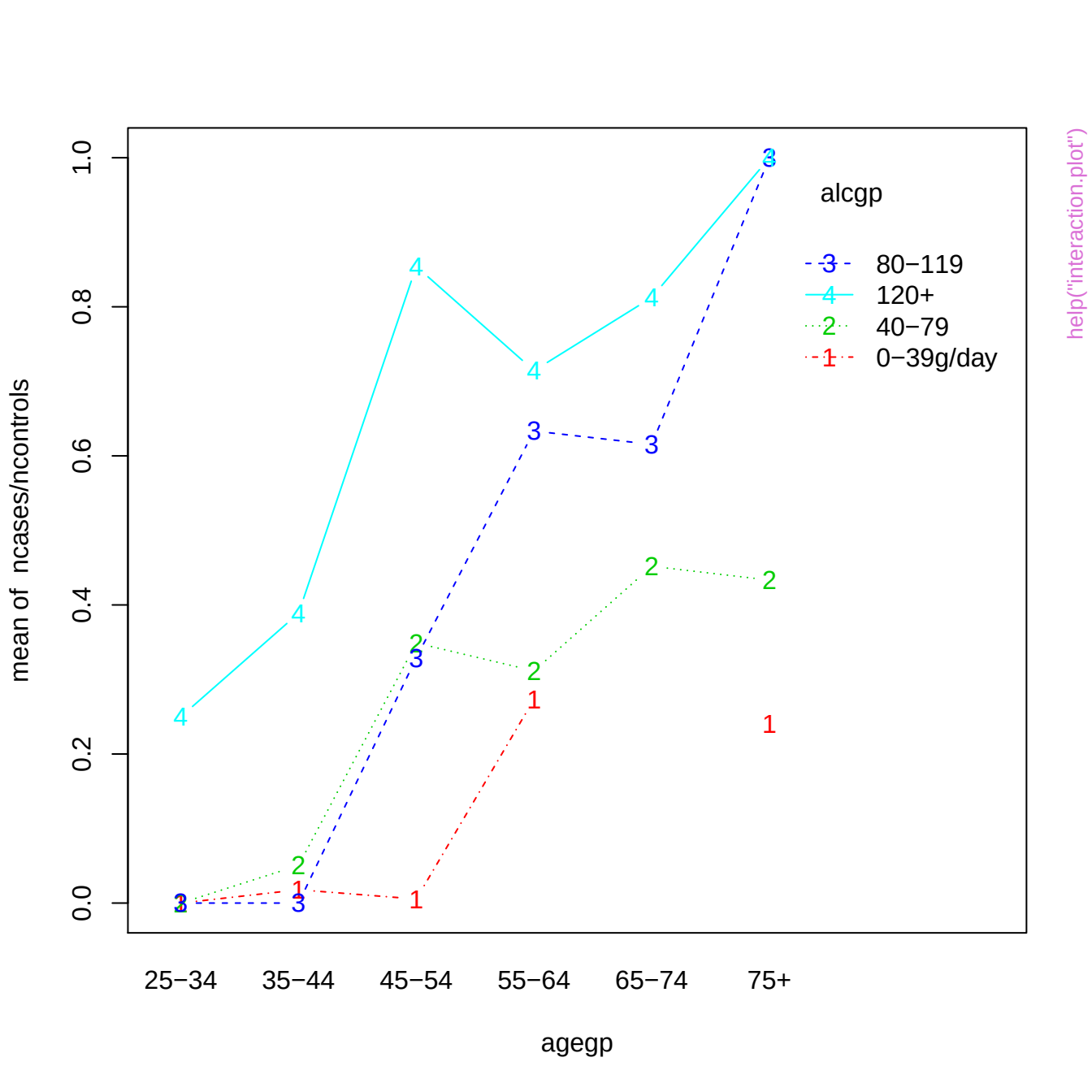

mean of decrease
0
20
40
60
80
100
120
1
2
3
4
5
6
7
8
rowpos
treatment
H
F
G
E
D
C
B
A
help("interaction.plot")

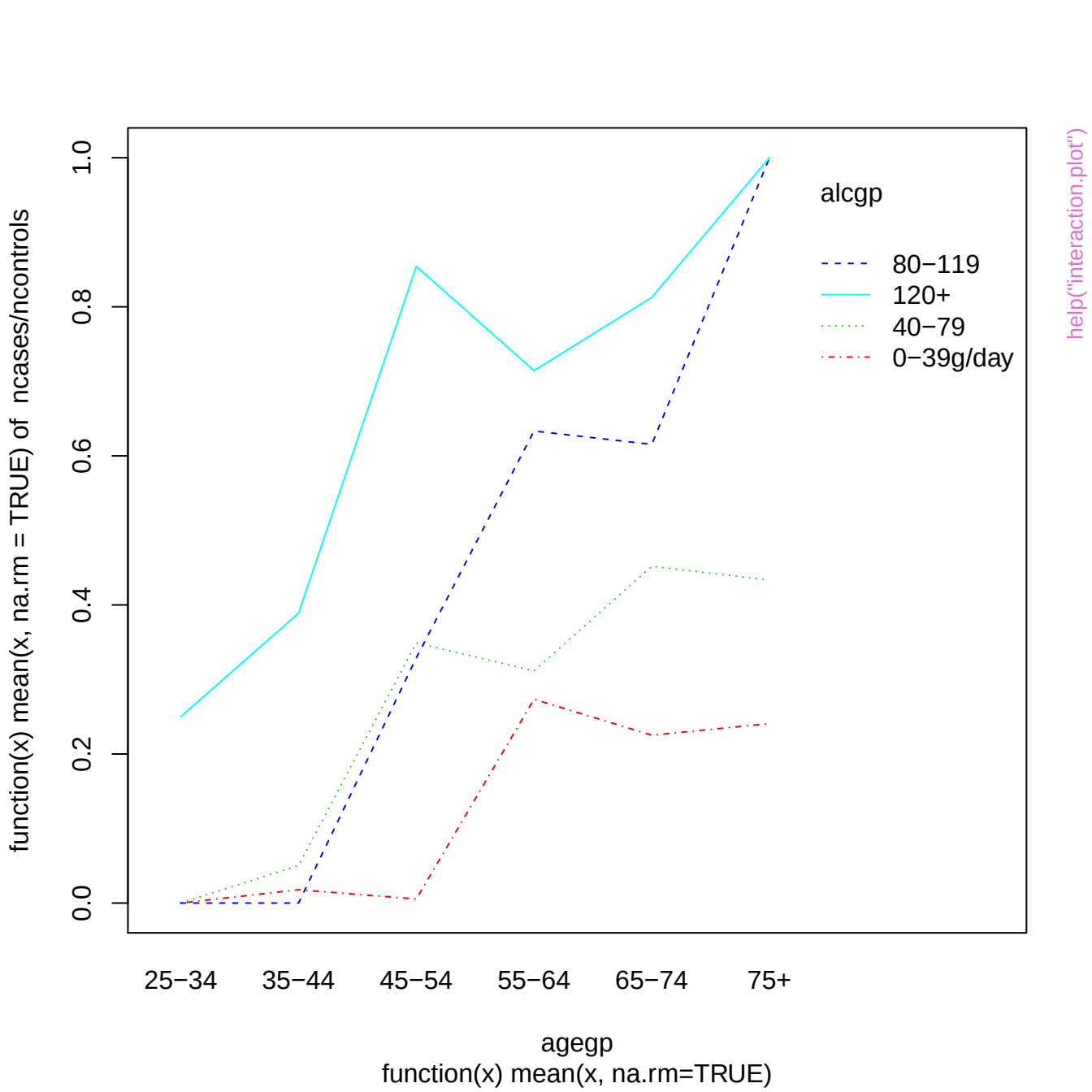

mean of decrease
0
20
40
60
80
100
120
5
6
4
7
8
3
2
1
rowpos
treatment
H
F
C
G
D
E
A
B
help("interaction.plot")

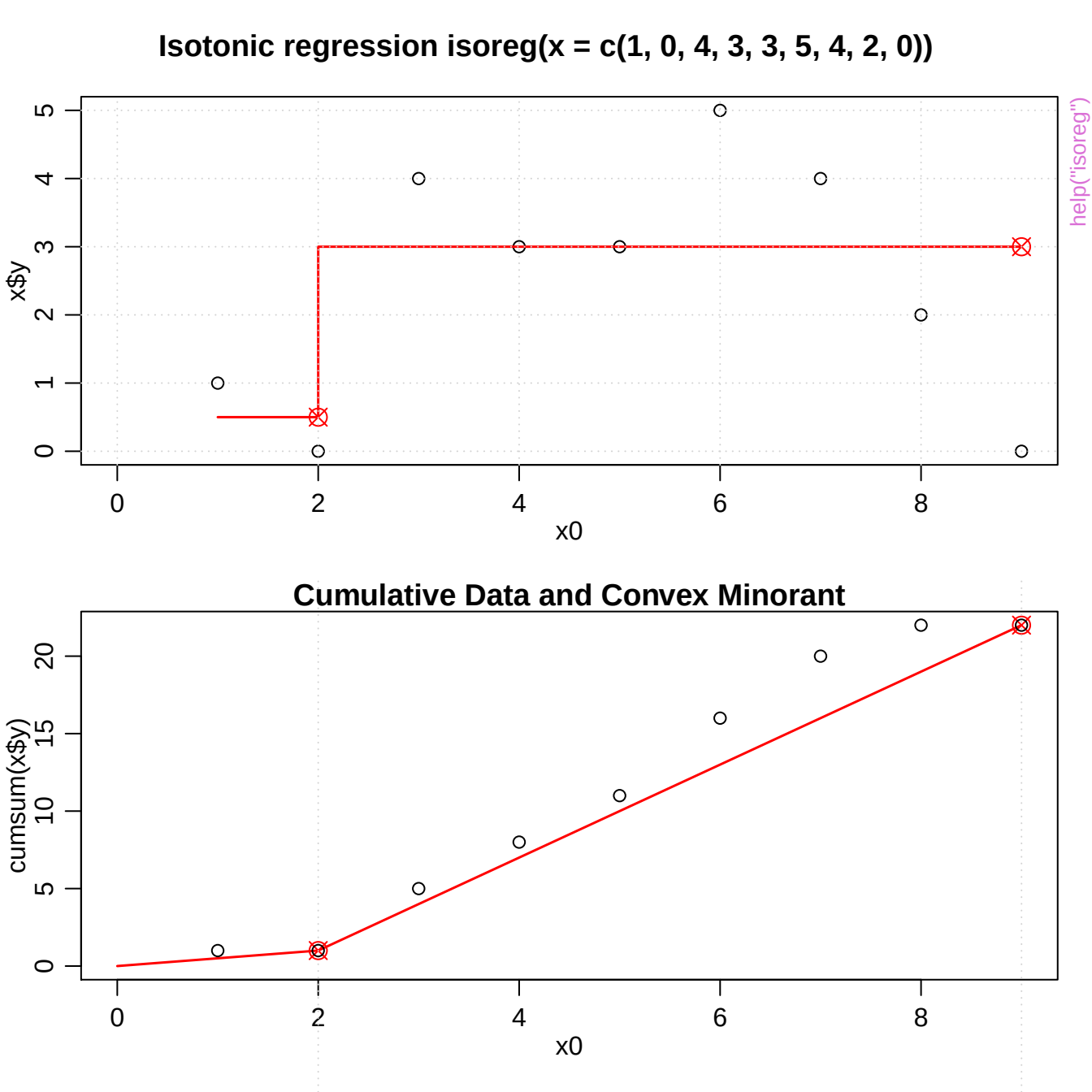

'esoph' Data
mean of ncases/ncontrols
0.0
0.2
0.4
0.6
0.8
1.0
25−34
35−44
45−54
55−64
65−74
75+
agegp
alcgp
80−119
120+
40−79
0−39g/day
help("interaction.plot")

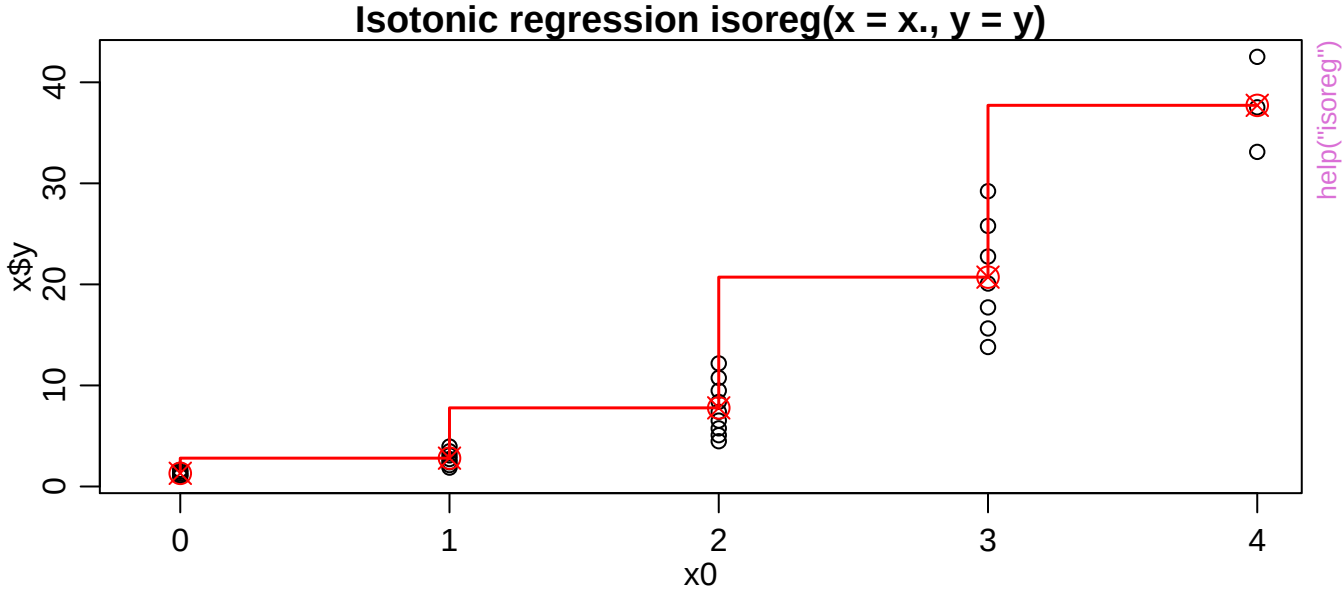

tobacco
0−9g/day
10−19
20−29
30+
mean of ncases/ncontrols
0.0
0.2
0.4
0.6
agegp
help("interaction.plot")

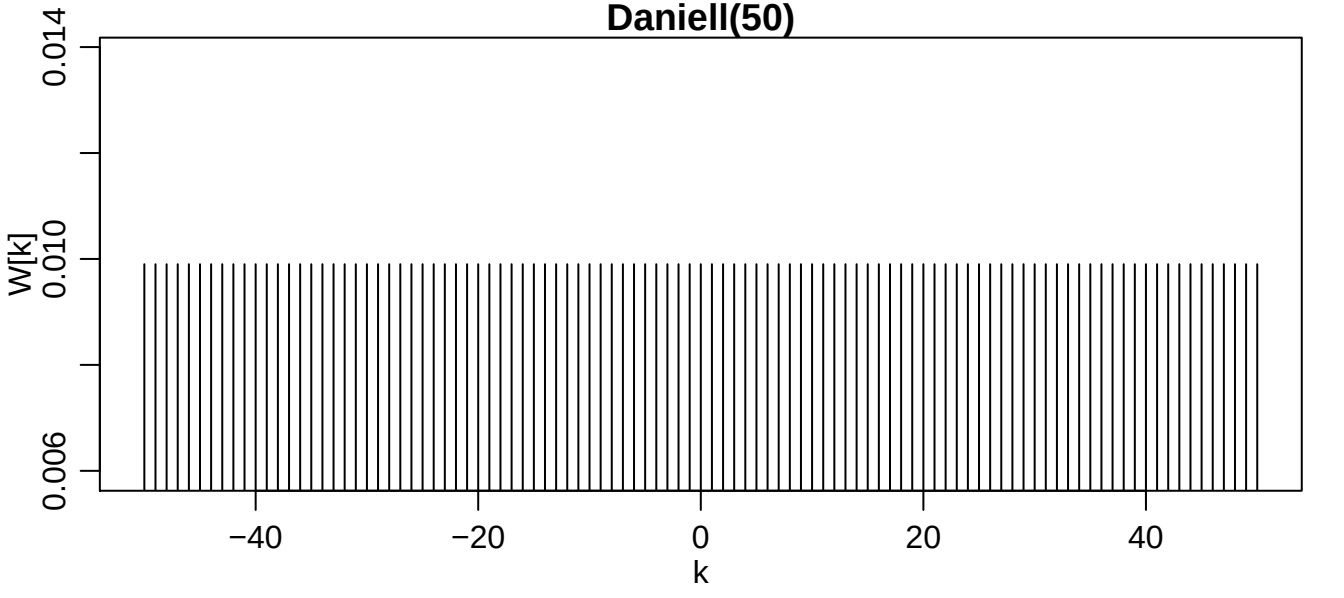

mean of ncases/ncontrols
0.0
0.2
0.4
0.6
0.8
1.0
25−34
35−44
45−54
55−64
65−74
75+
agegp
alcgp
80−119
120+
40−79
0−39g/day
help("interaction.plot")

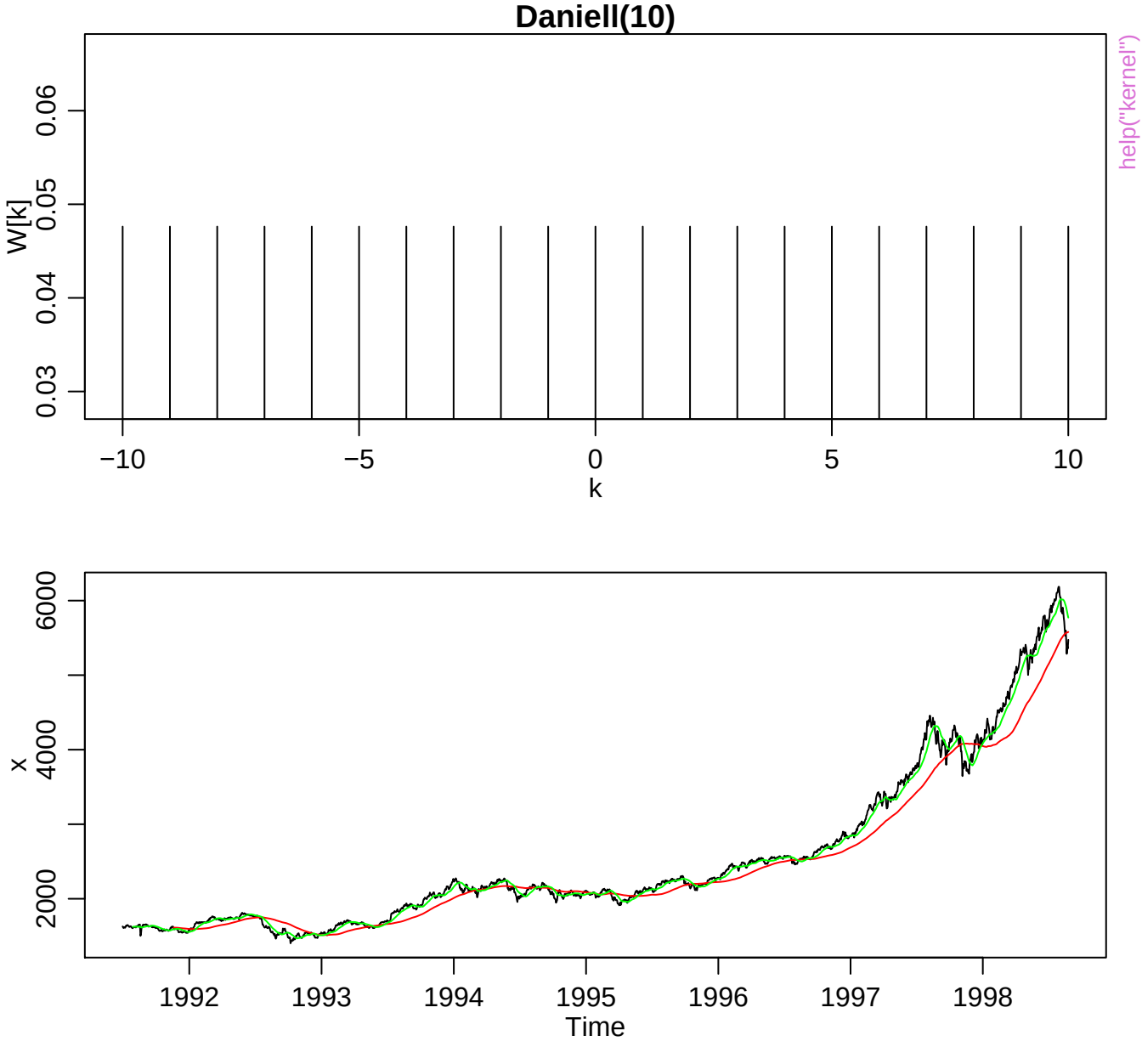

mean of ncases/ncontrols
0.0
0.2
0.4
0.6
0.8
1.0
25−34
35−44
45−54
55−64
65−74
75+
agegp
alcgp
80−119
120+
40−79
0−39g/day
help("interaction.plot")

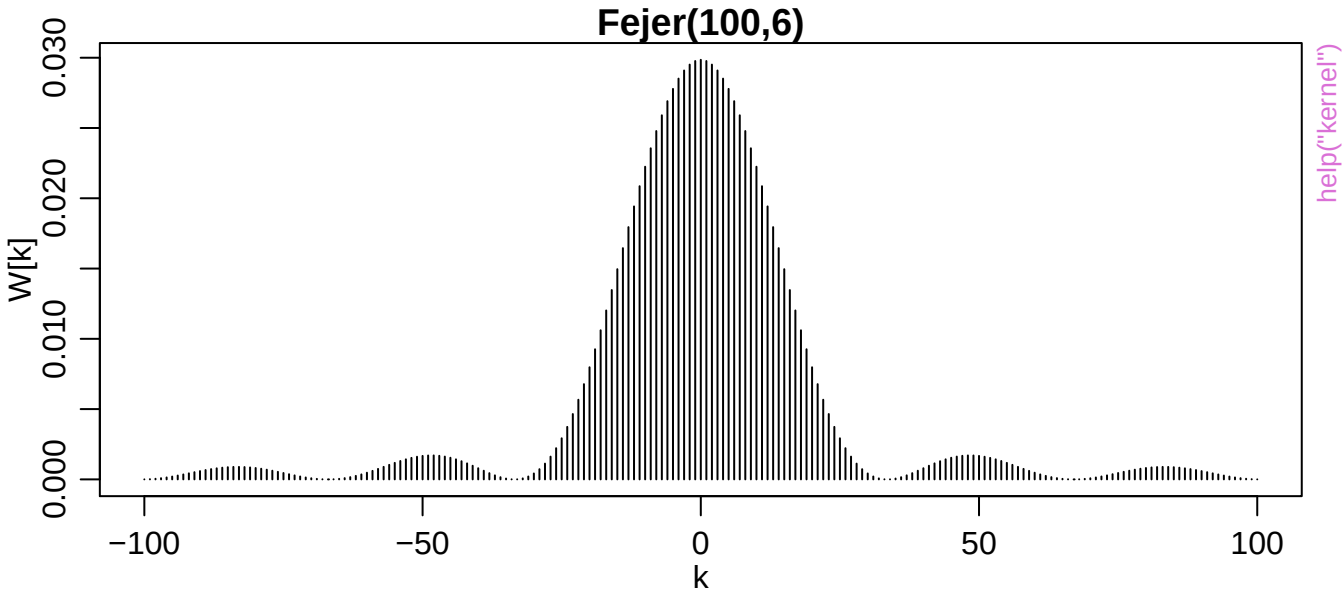

help("interaction.plot")
function(x) mean(x, na.rm = TRUE) of ncases/ncontrols
1.0
0.8
0.6
0.4
0.2
0.0
alcgp
80−119
120+
40−79
0−39g/day
25−34
35−44
45−54
55−64
65−74
75+
agegp
function(x) mean(x, na.rm=TRUE)


Isotonic regression isoreg(x = c(1, 0, 4, 3, 3, 5, 4, 2, 0))
x$y
x0
help("isoreg")
Cumulative Data and Convex Minorant
cumsum(x$y)
x0

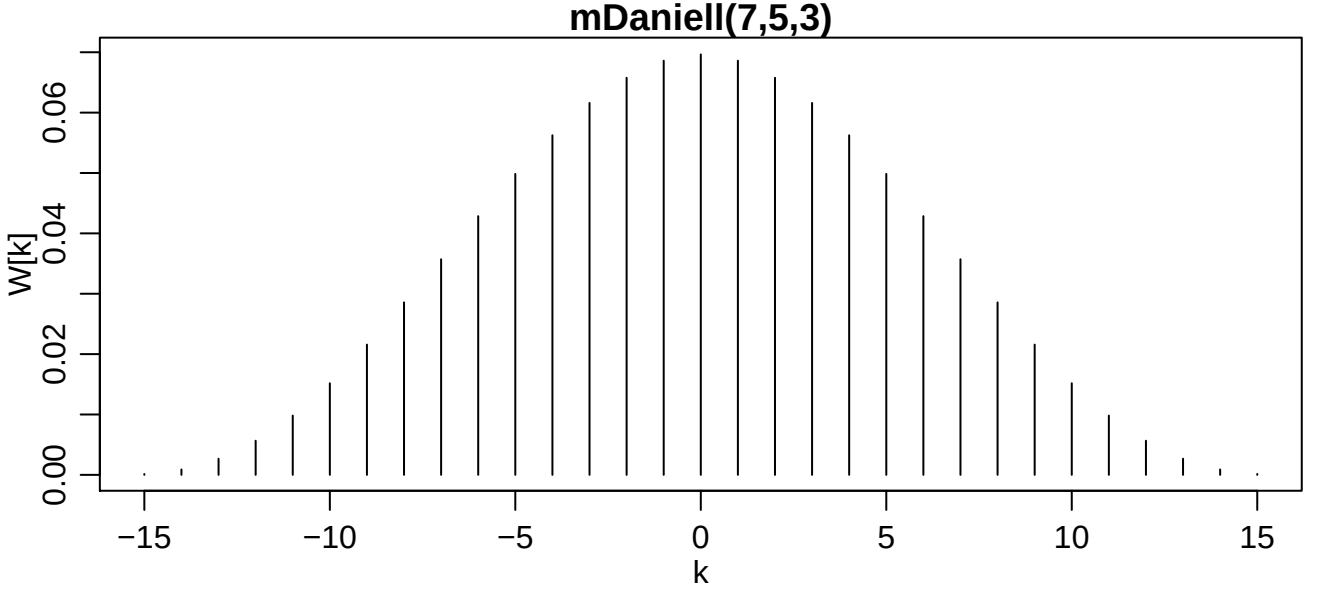

Isotonic regression isoreg(x = x., y = y)
x$y
x0
help("isoreg")
0
10
20
30
40
0
1
2
3
4

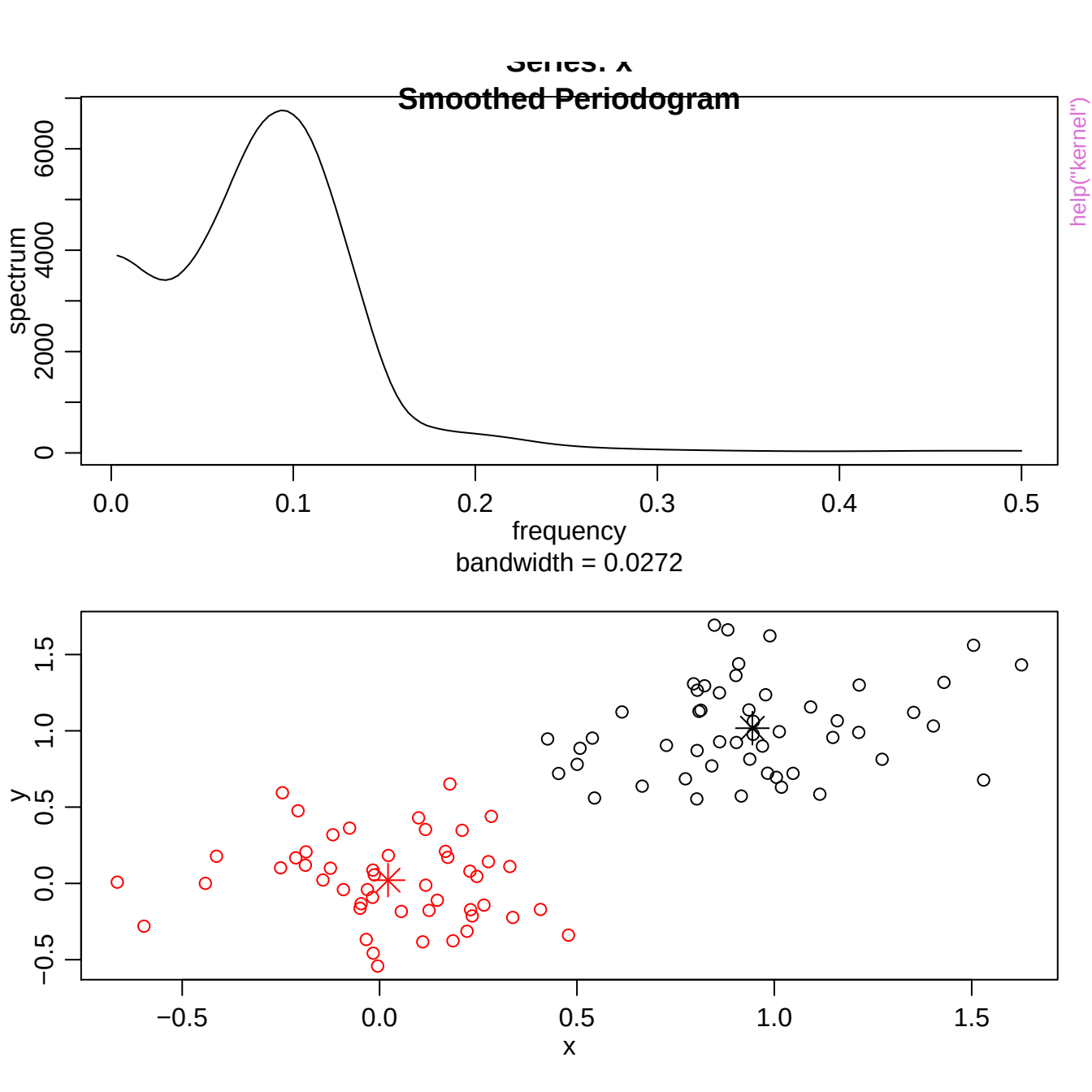

Daniell(50)
W[k]
k
0.006
0.010
0.014
−40
−20
0
20
40

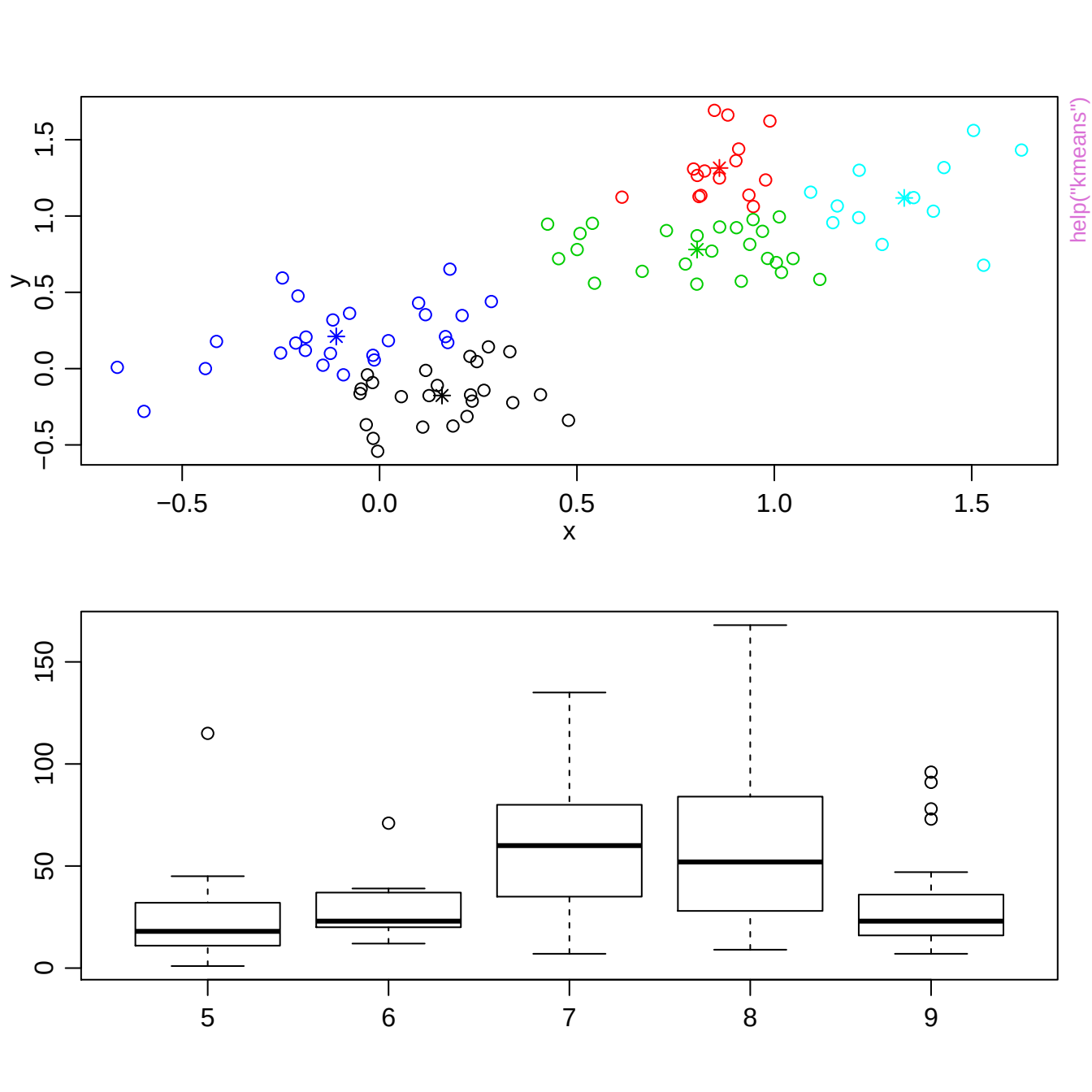

Daniell(10)
W[k]
0.03
0.04
0.05
0.06
−10
−5
0
5
10
k
help("kernel")
x
2000
4000
6000
1992
1993
1994
1995
1996
1997
1998
Time

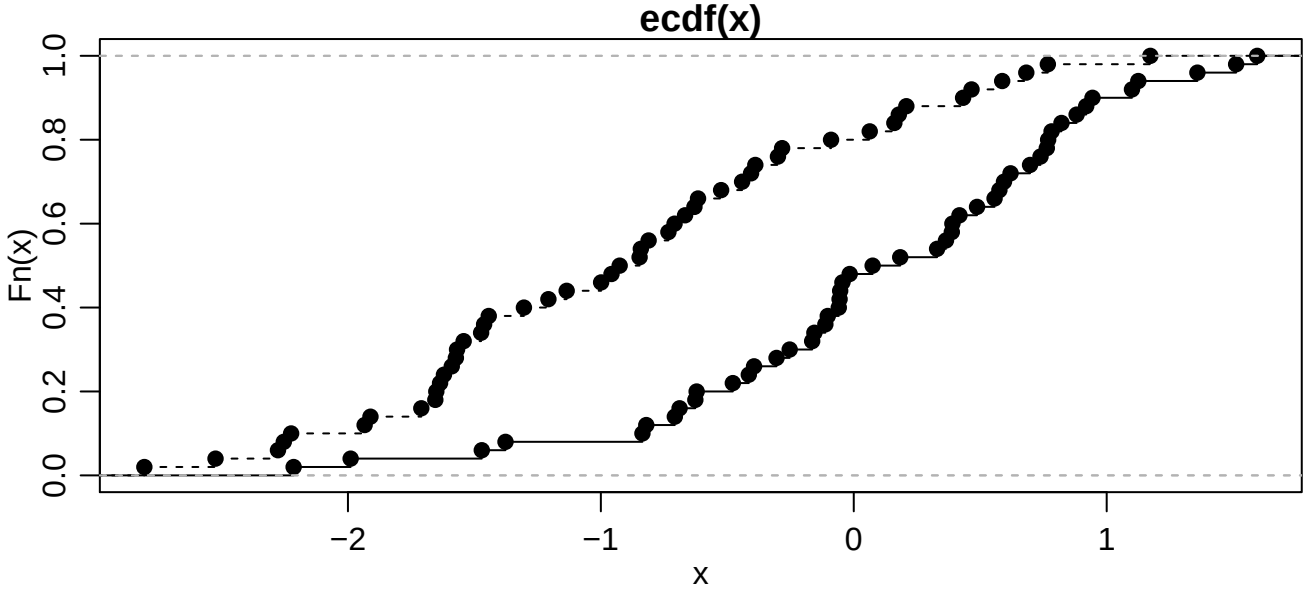

Fejer(100,6)
W[k]
0.000
0.010
0.020
0.030
−100
−50
0
50
100
k

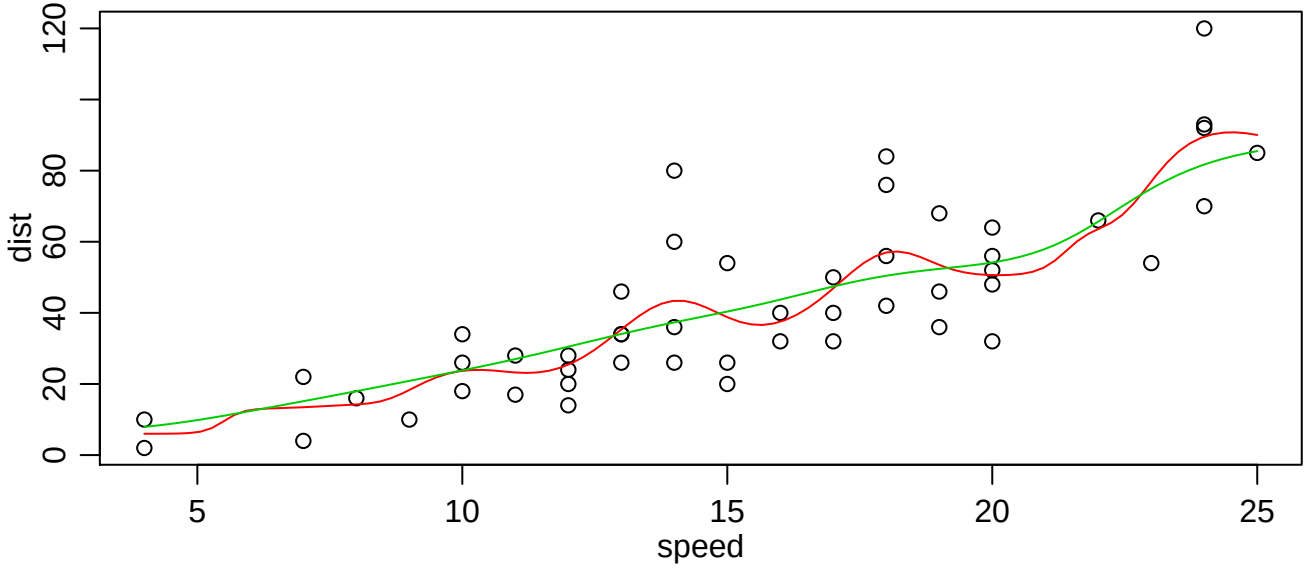
help("kernel")

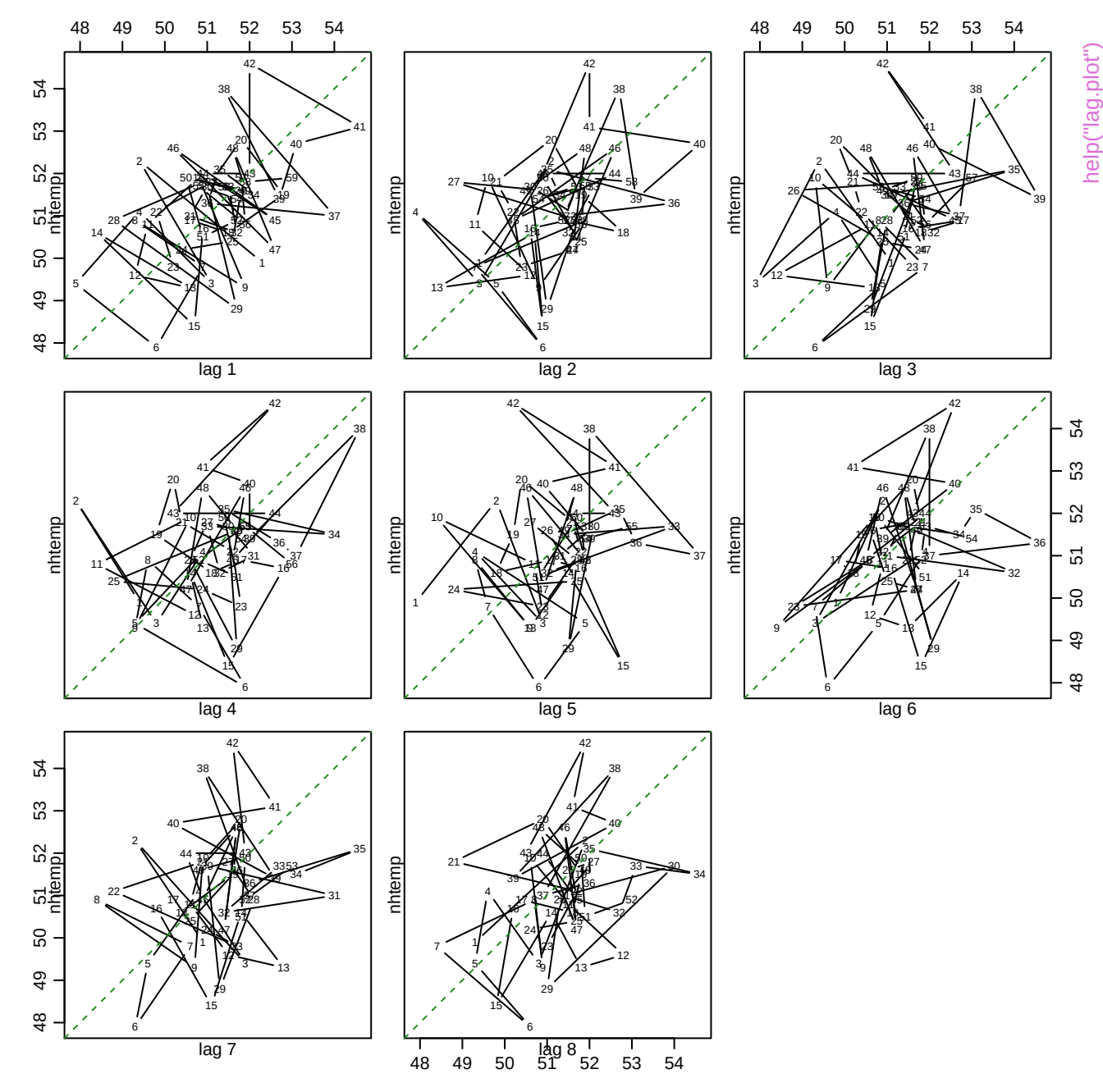

mDaniell(7,5,3)
W[k]
0.00
0.02
0.04
0.06
−15
−10
−5
0
5
10
15
k


Series: x
Smoothed Periodogram
spectrum
0
2000
4000
6000
0.0
0.1
0.2
0.3
0.4
0.5
frequency
bandwidth = 0.0272
help("kernel")
y
−0.5
0.0
0.5
1.0
1.5
x

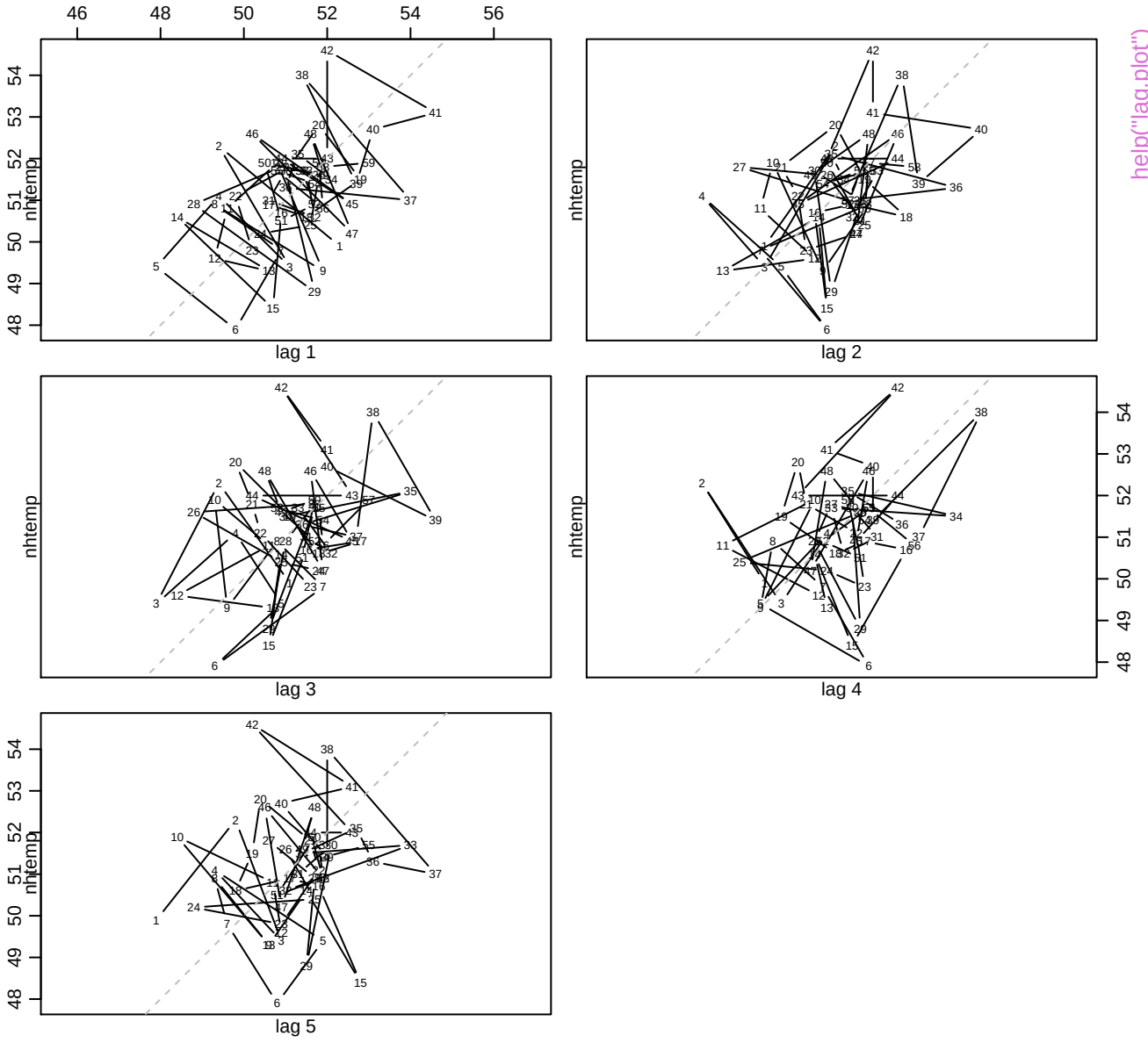

help("kmeans")
y
x
−0.5
0.0
0.5
1.0
1.5
0
50
100
150
5
6
7
8
9


ecdf(x)
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−2
−1
0
1
x
help("ks.test")

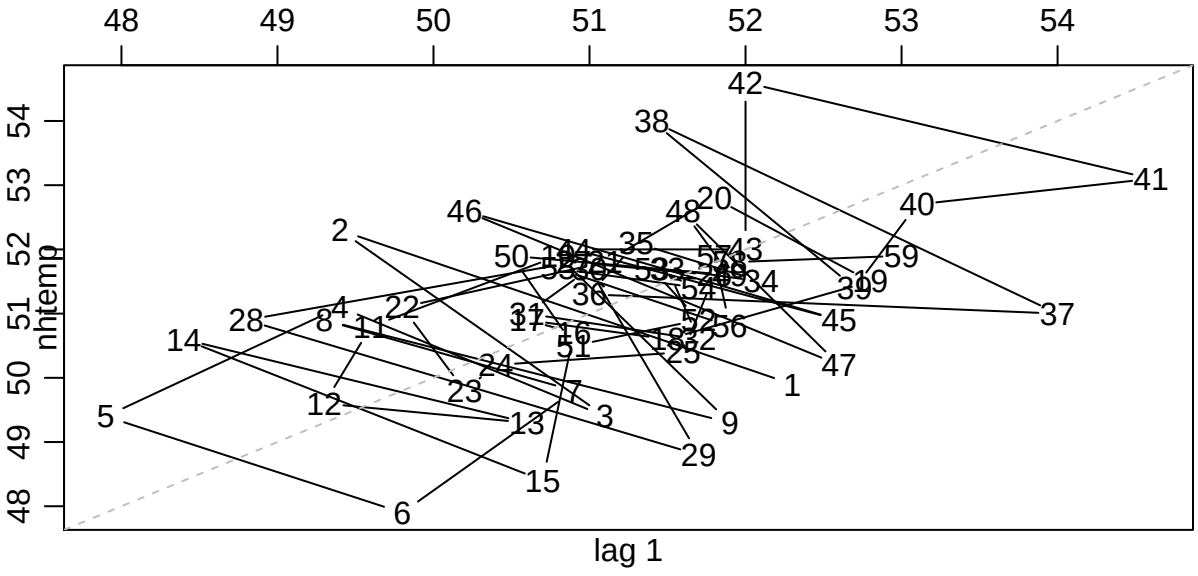

dist
0
20
40
60
80
120
5
10
15
20
25
speed

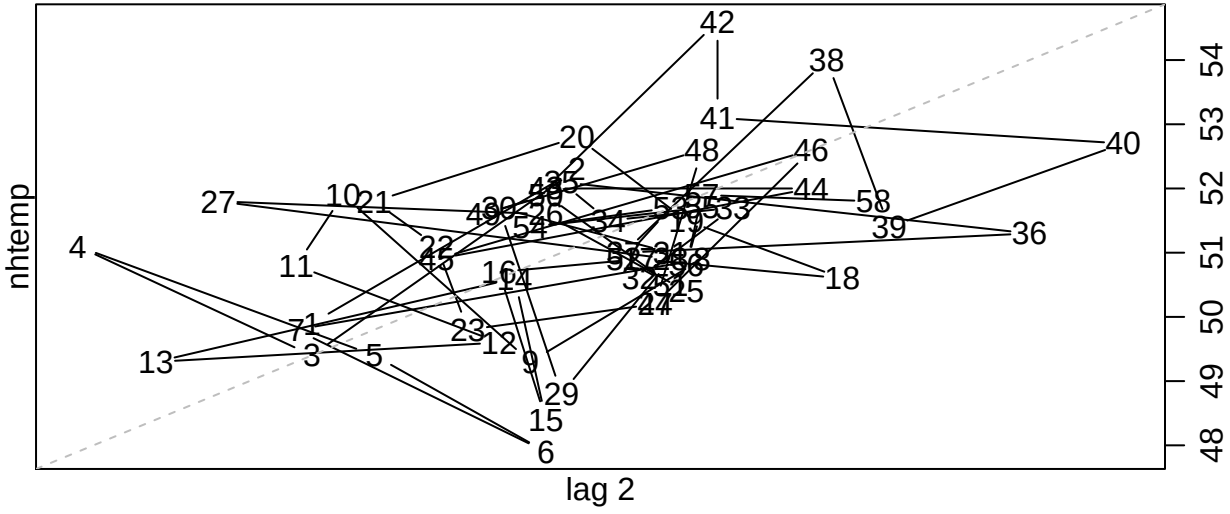

help("lag.plot")
nhtemp
lag 1
lag 2
lag 3
lag 4
lag 5
lag 6
lag 7
lag 8
48
49
50
51
52
53
54

Average Temperatures in New Haven



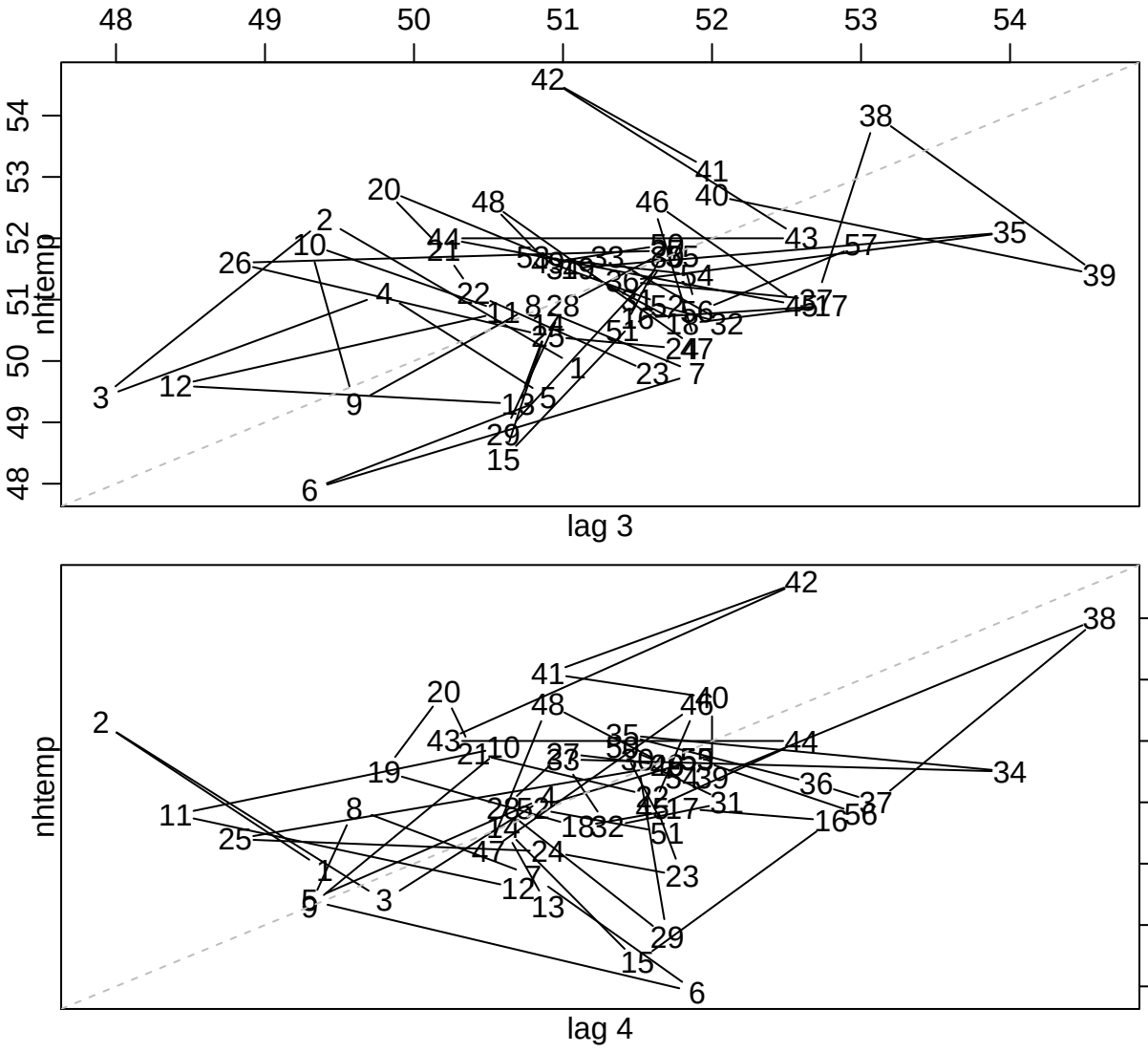
New Haven Temperatures





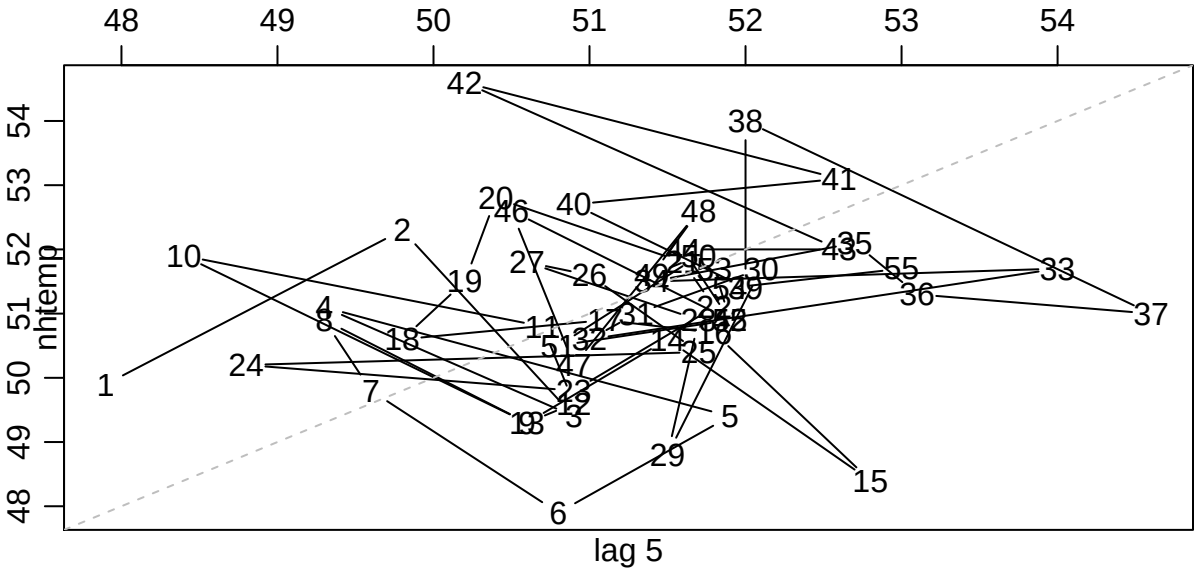
help("lag.plot")

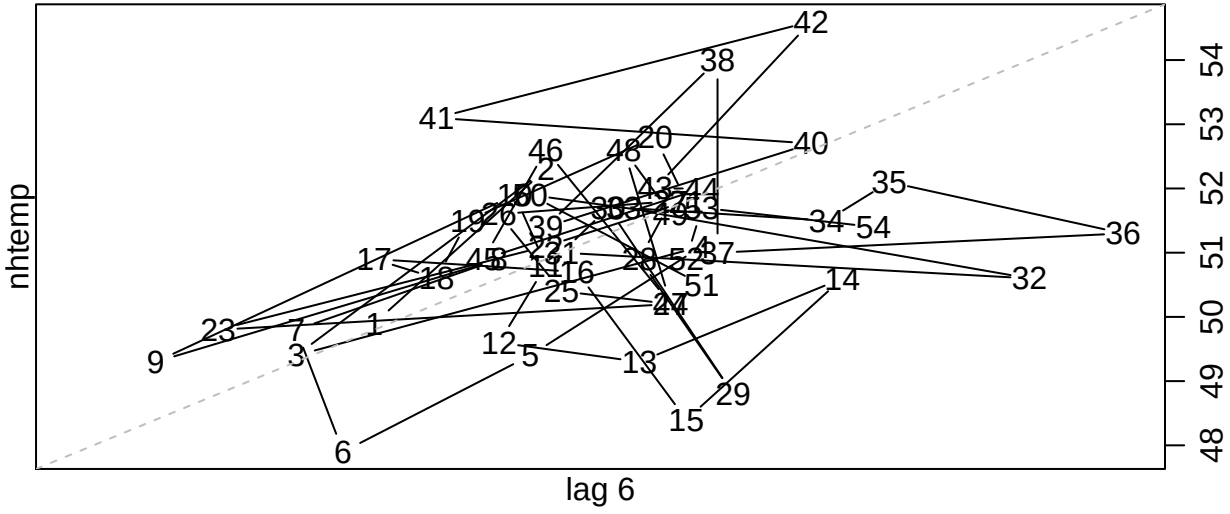
New Haven Temperatures



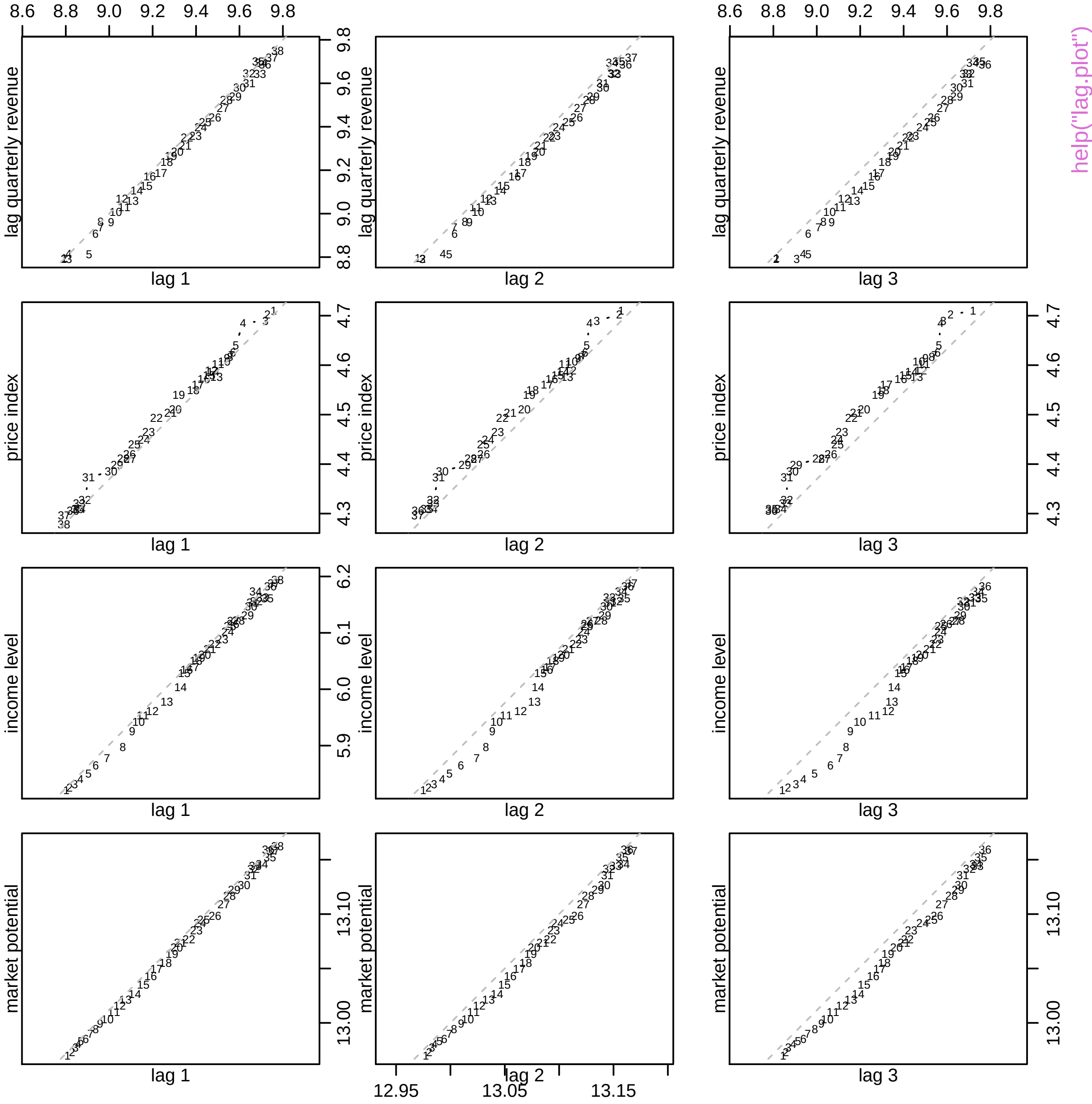
help("lag.plot")

New Haven Temperatures

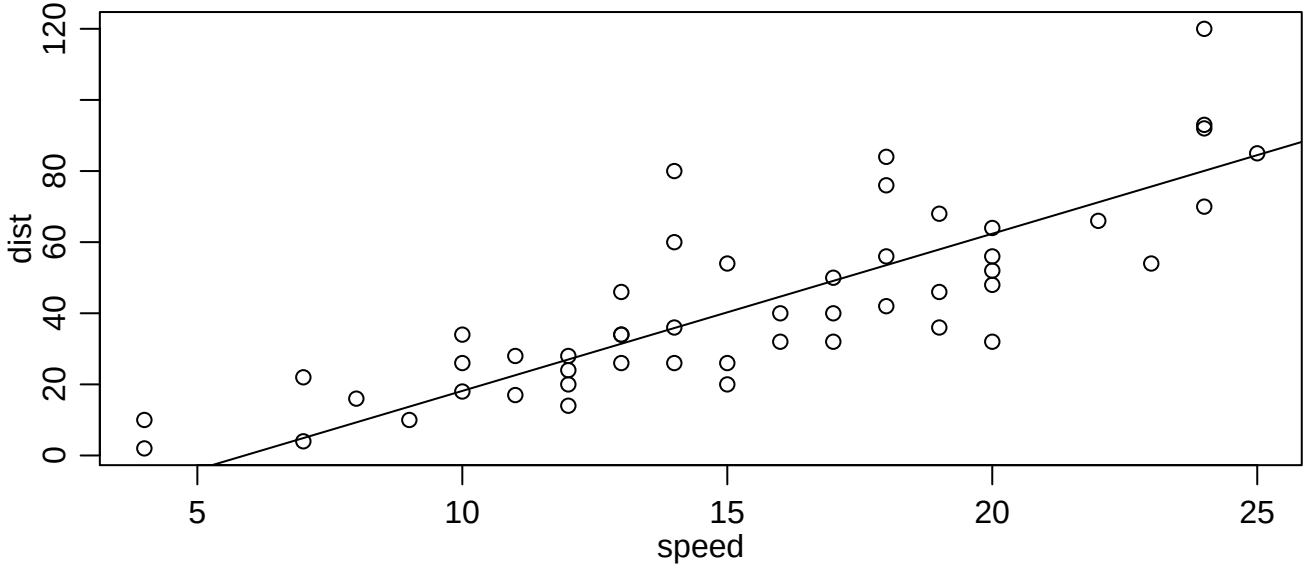




help("lag.plot")

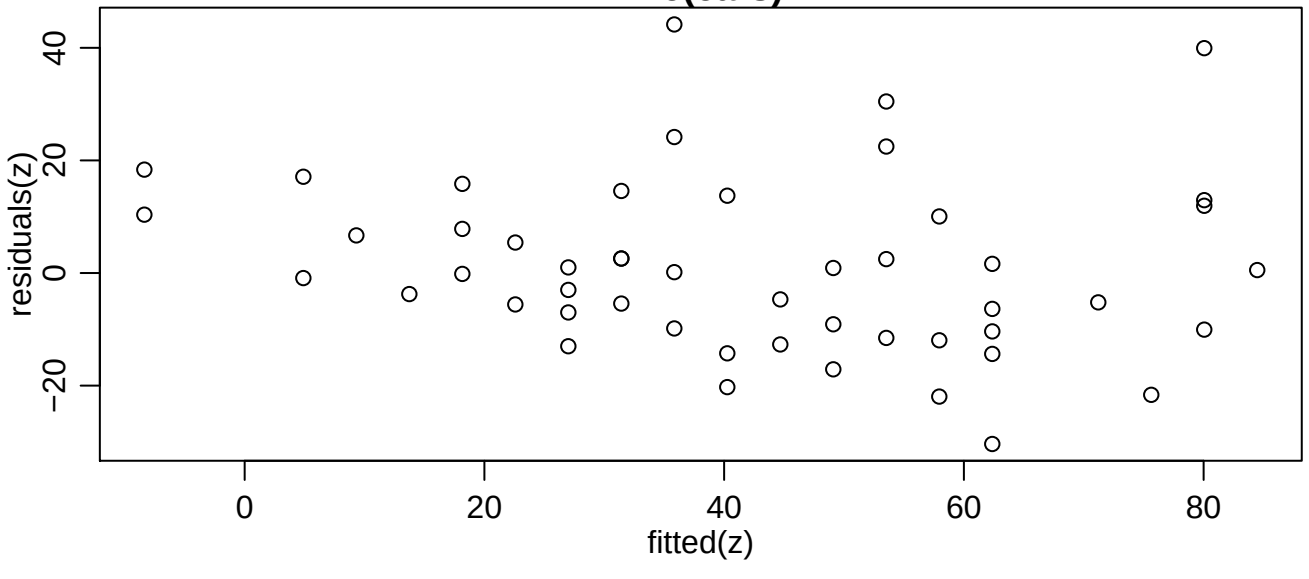


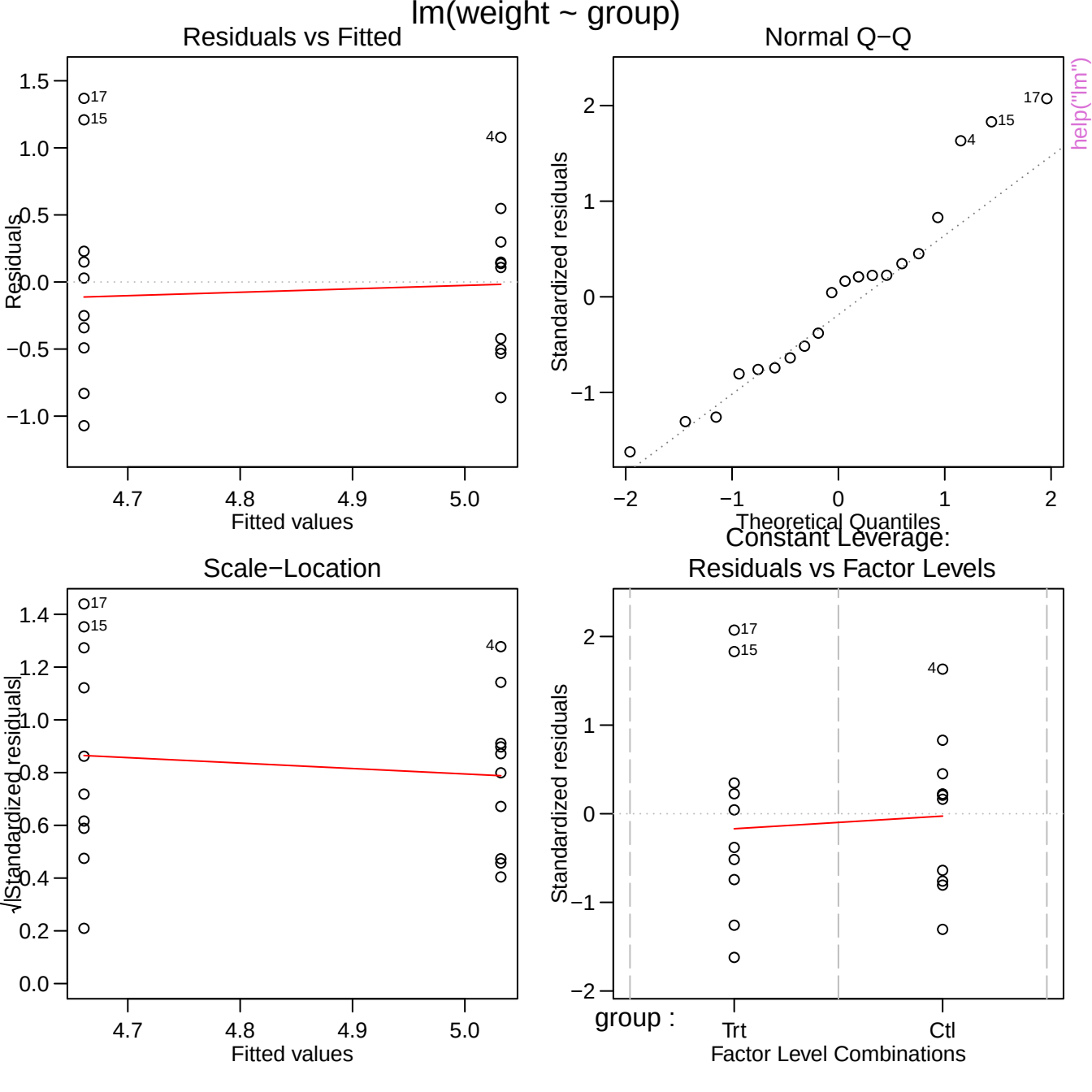
8.6
8.8
9.0
9.2
9.4
9.6
9.8
lag quarterly revenue
lag 1
lag 2
lag 3
price index
income level
market potential
12.95
13.05
13.15
13.00
13.10
4.3
4.4
4.5
4.6
4.7
5.9
6.0
6.1
6.2
help("lag.plot")

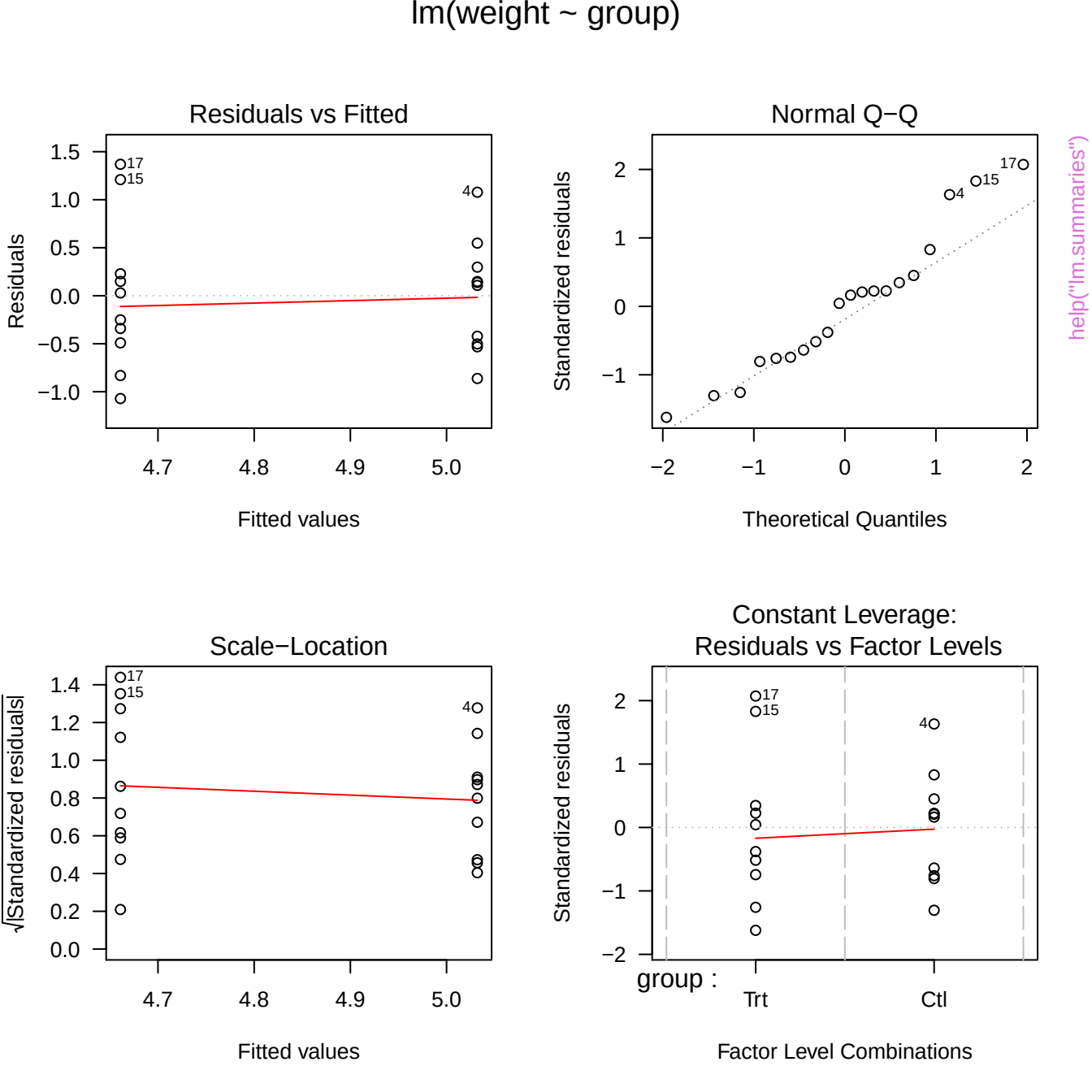


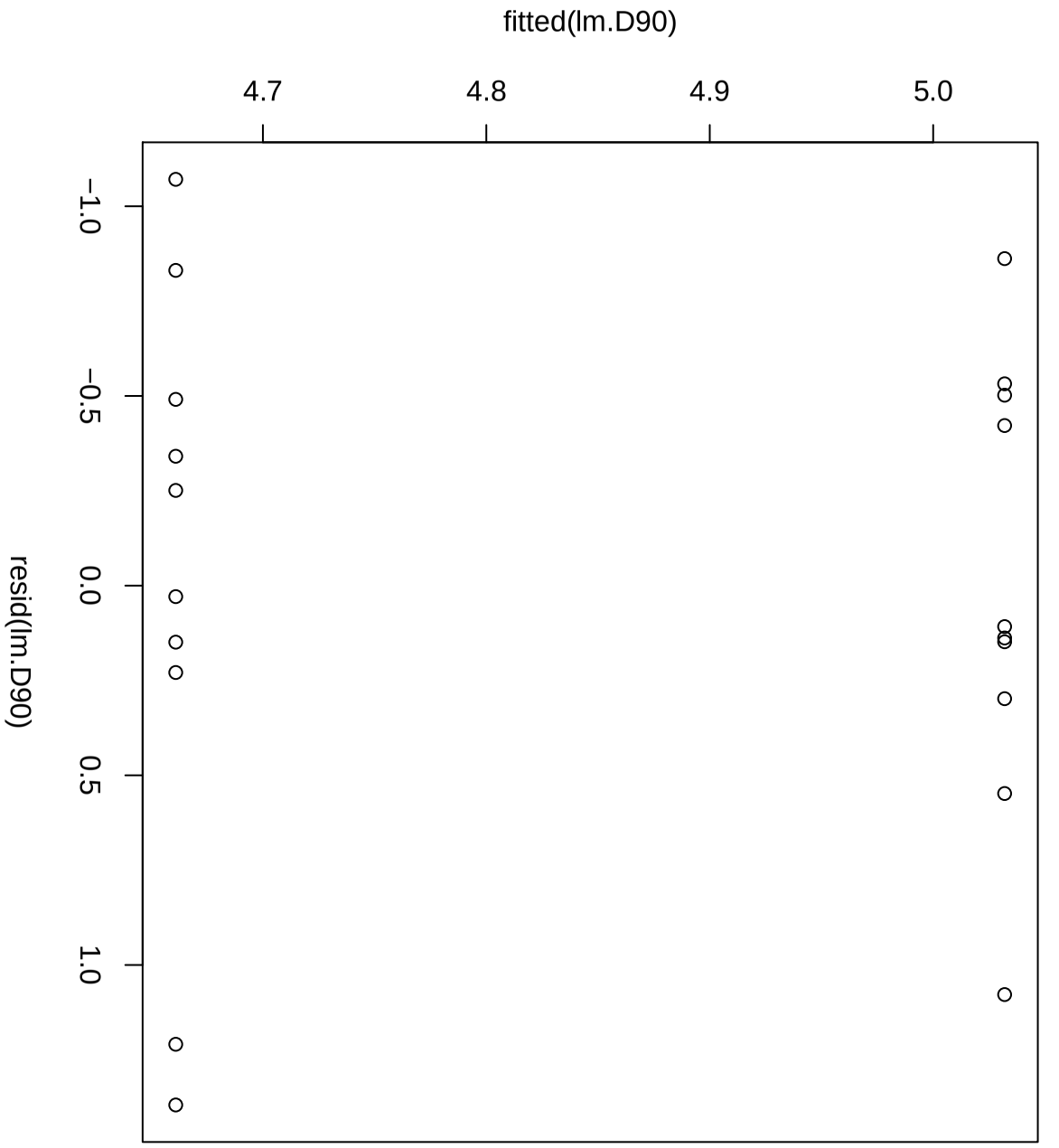
help("line")

line(cars)

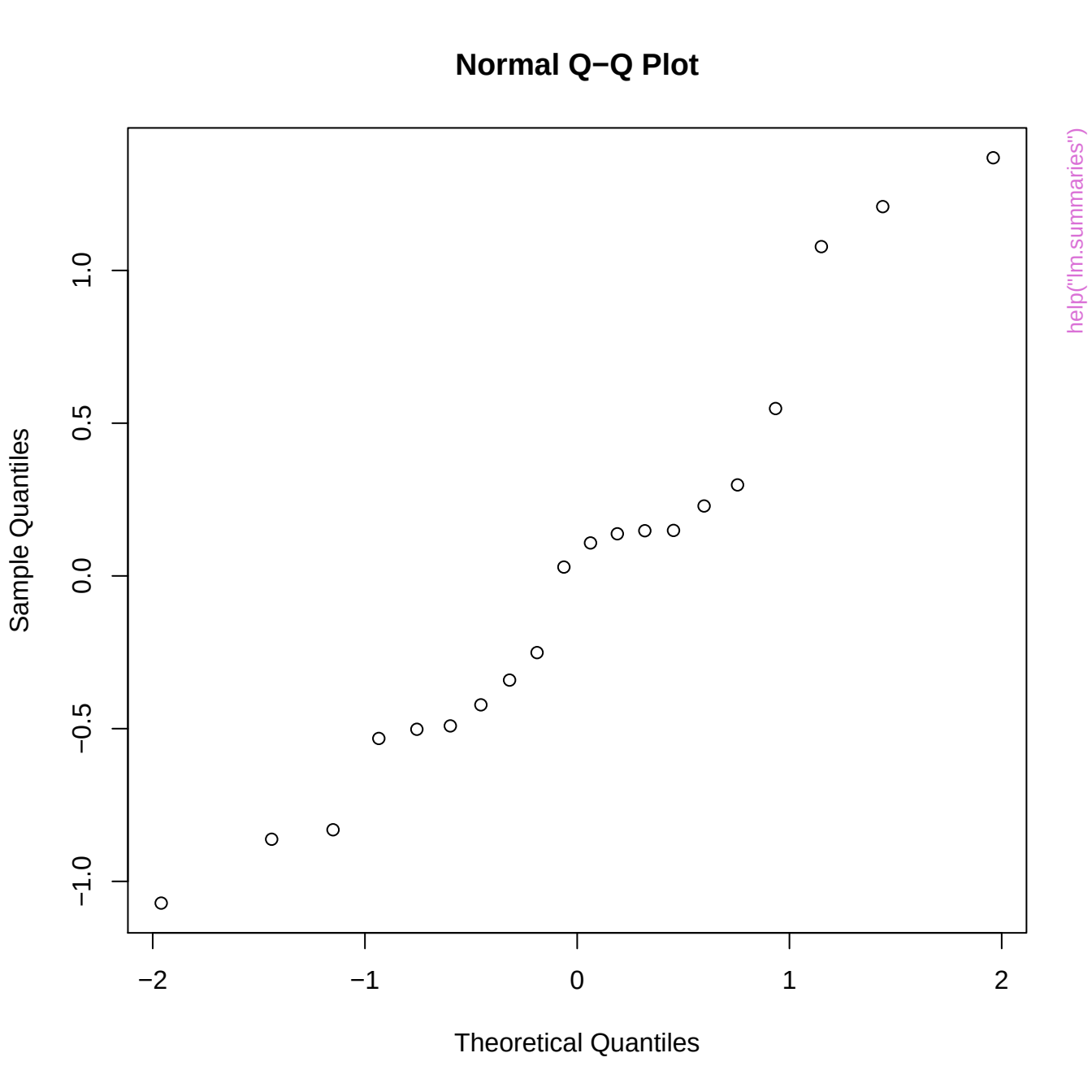


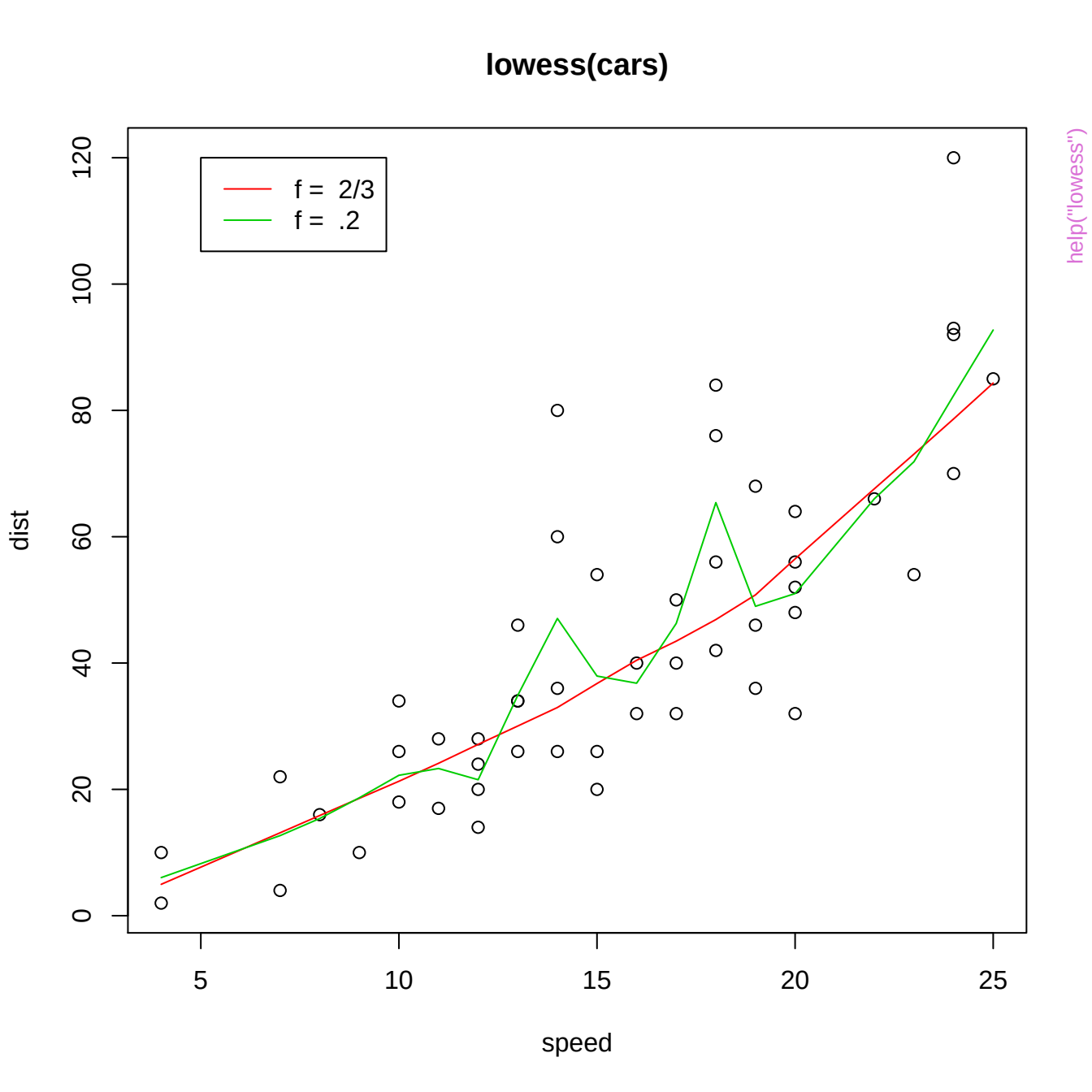

lm(weight ~ group)
Residuals vs Fitted
Residuals
Fitted values
17
15
4
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("lm")
Scale−Location
√|Standardized residuals|
Constant Leverage:
Residuals vs Factor Levels
group :
Trt
Ctl
Factor Level Combinations

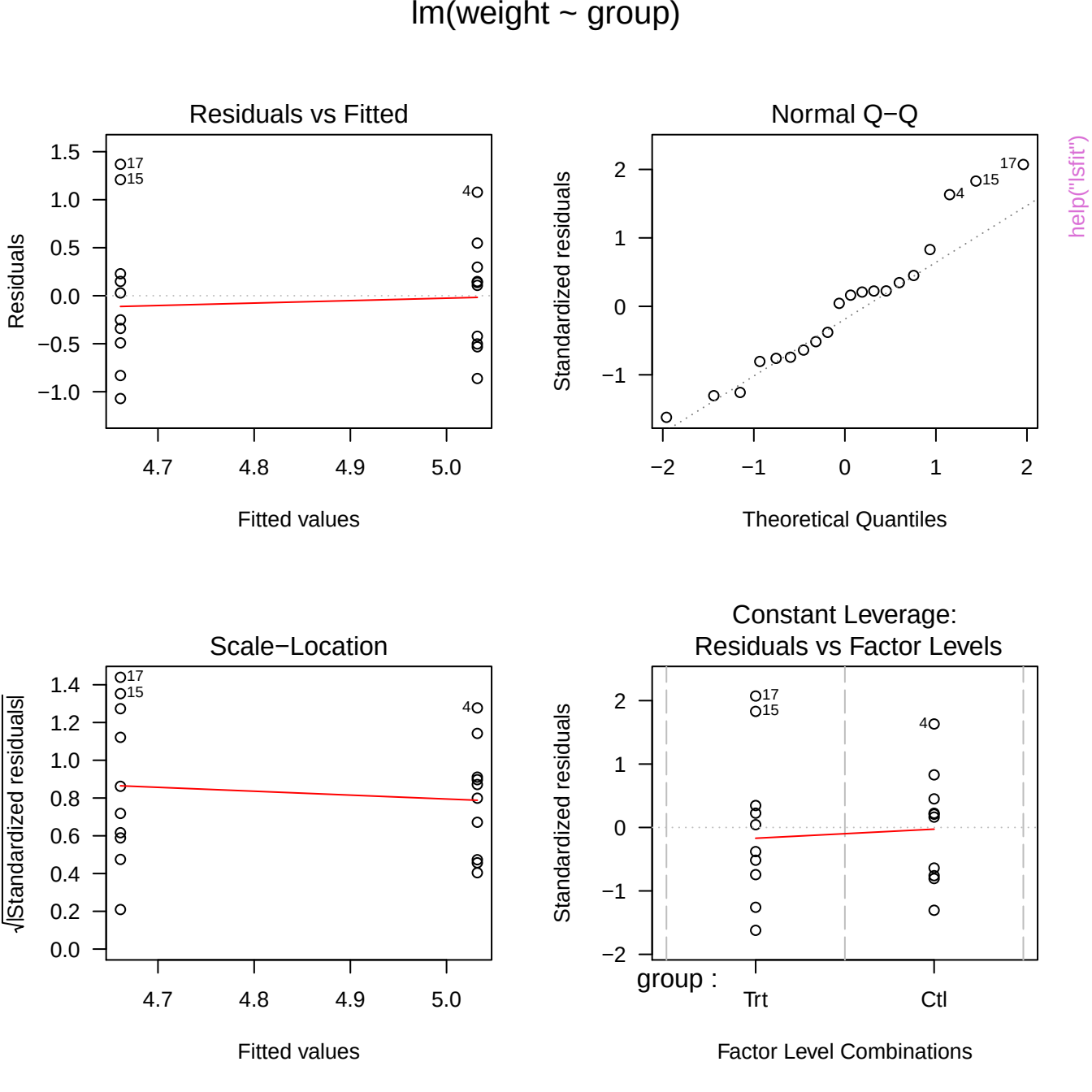

lm(weight ~ group)
Residuals vs Fitted
Residuals
Fitted values
17
15
4
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("lm.summaries")
Scale−Location
√|Standardized residuals|
Constant Leverage:
Residuals vs Factor Levels
group :
Trt
Ctl
Factor Level Combinations

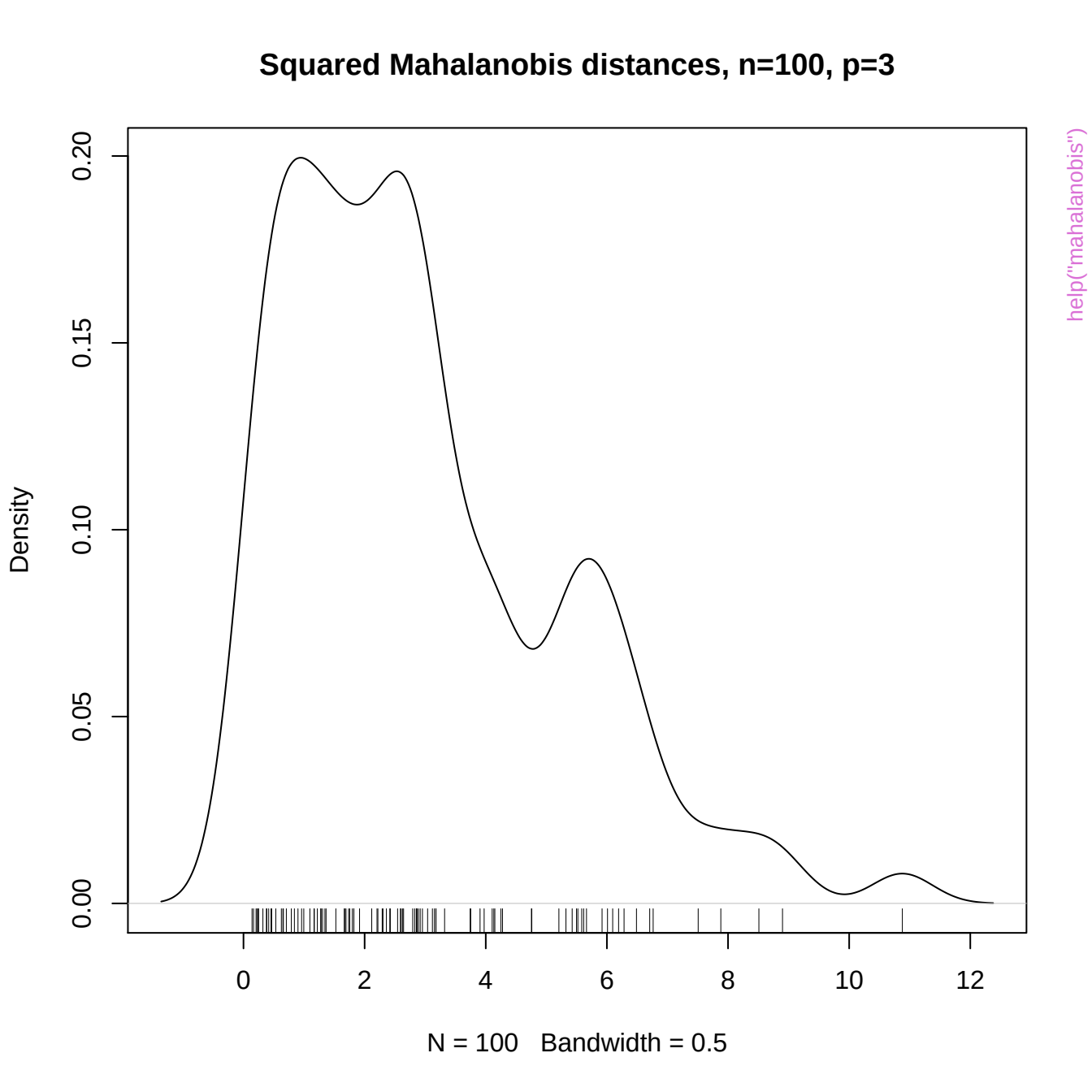


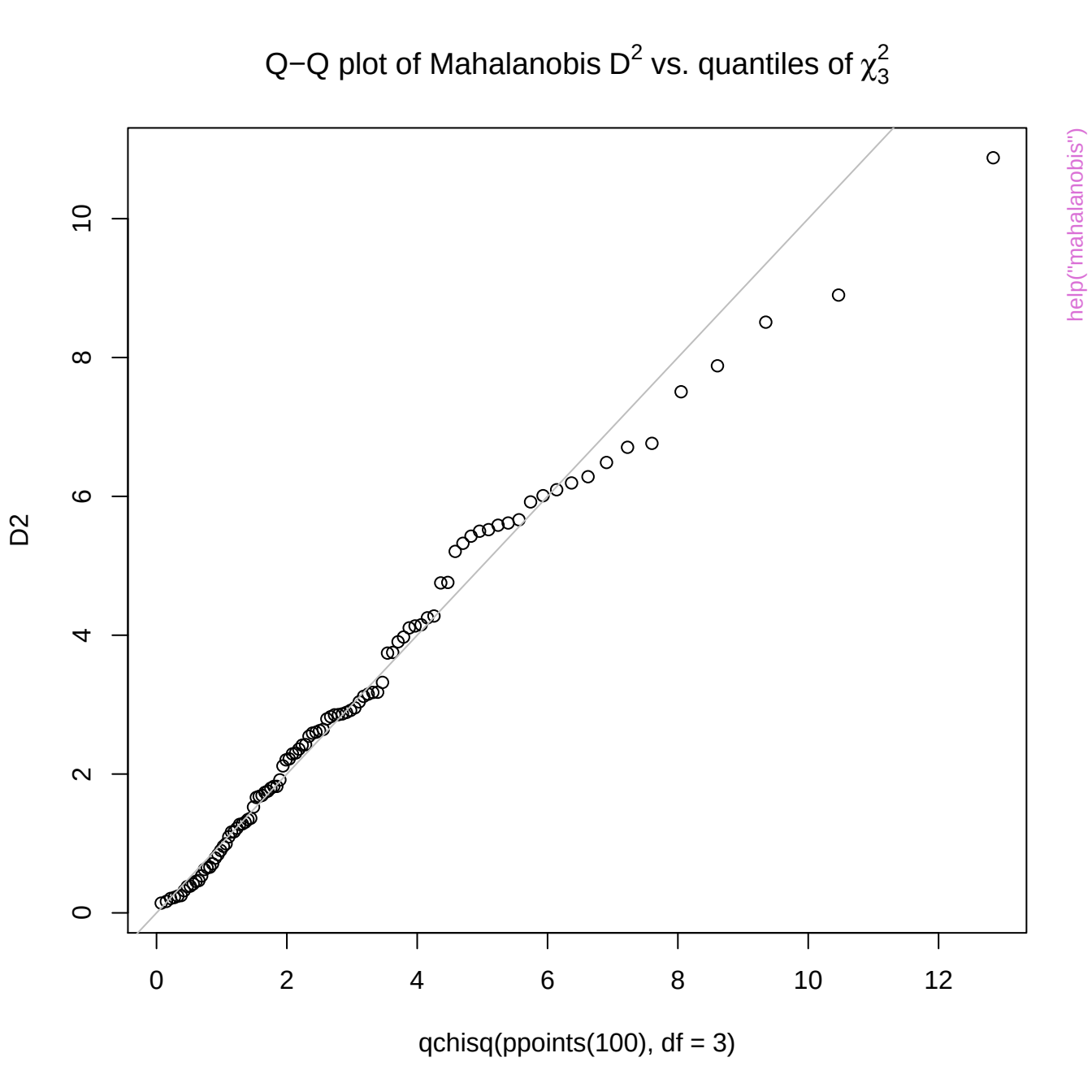
help("lm.summaries")

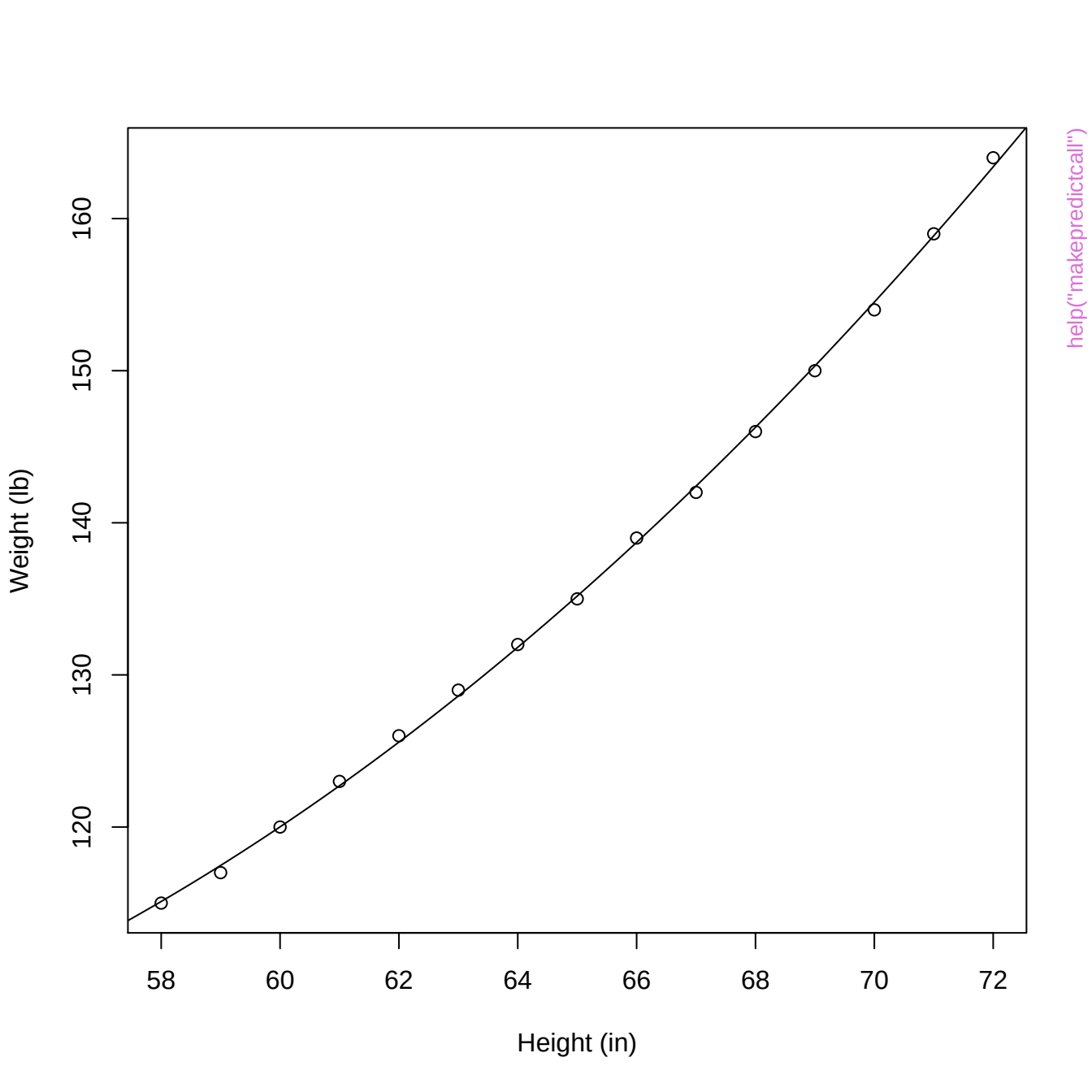

Normal Q−Q Plot
Sample Quantiles
Theoretical Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
help("lm.summaries")

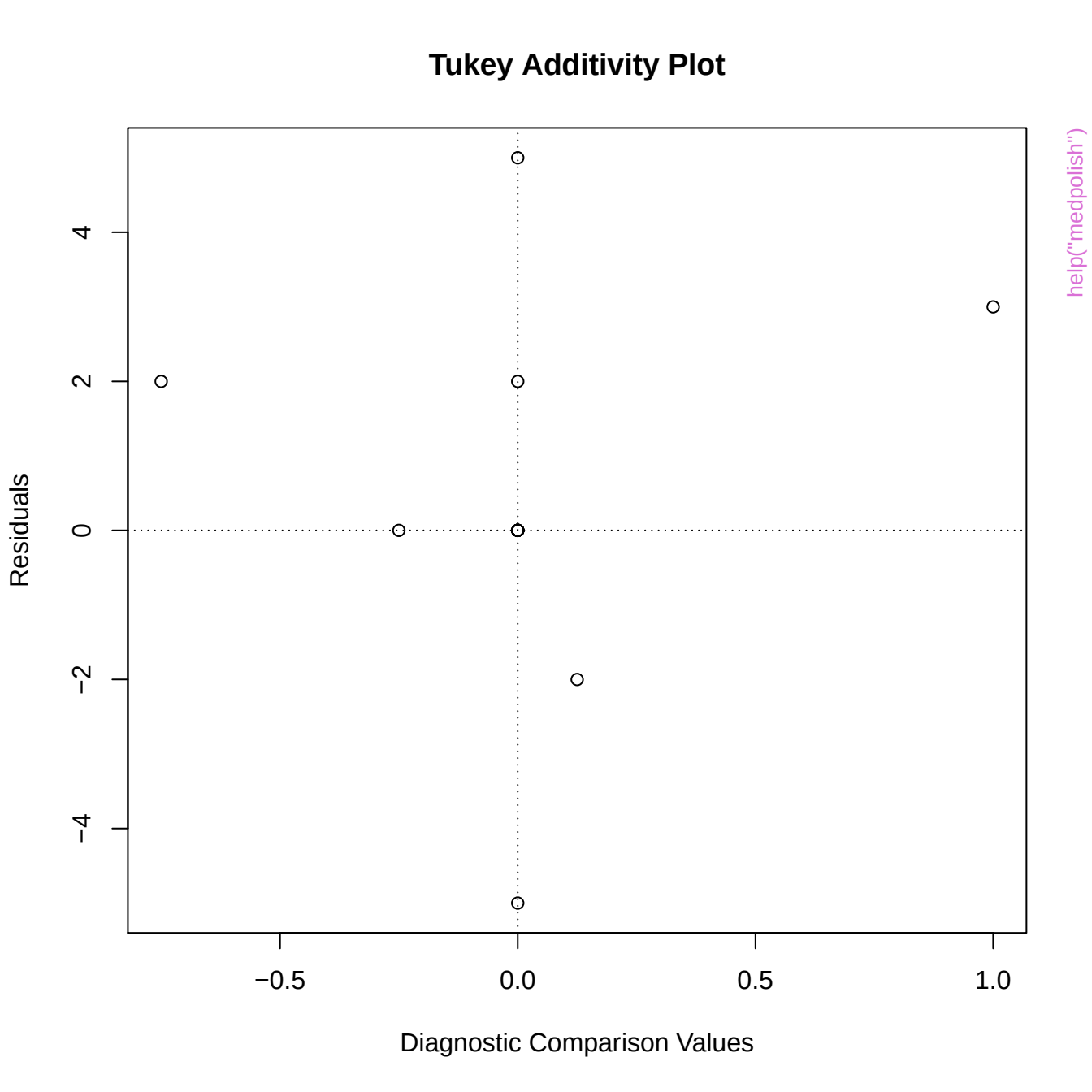

lowess(cars)
f = 2/3
f = .2
dist
speed
0
20
40
60
80
100
120
5
10
15
20
25
help("lowess")

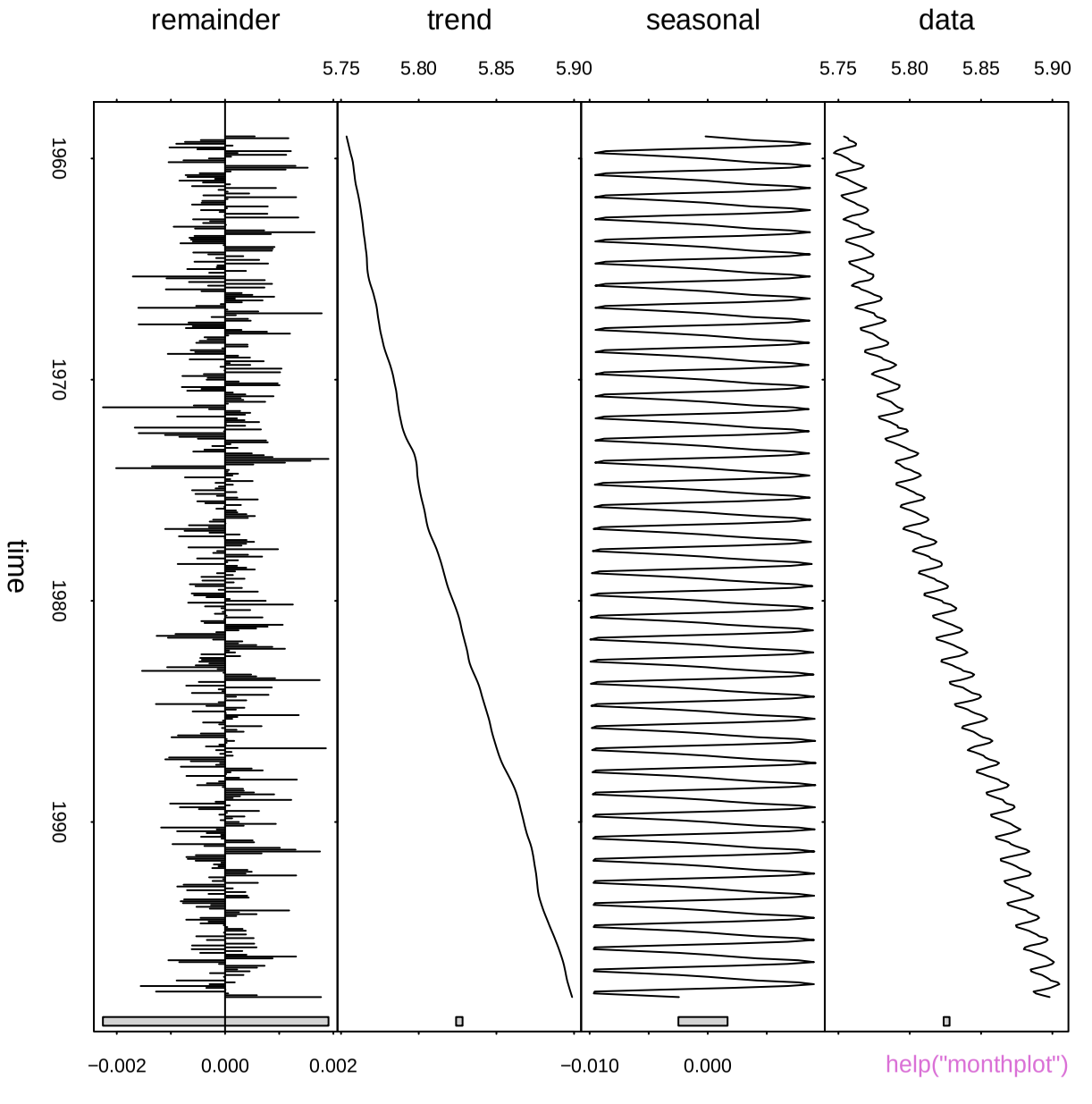

lm(weight ~ group)
Residuals vs Fitted
Residuals
Fitted values
17
15
4
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("lsfit")
Scale−Location
√|Standardized residuals|
Constant Leverage:
Residuals vs Factor Levels
group :
Trt
Ctl
Factor Level Combinations

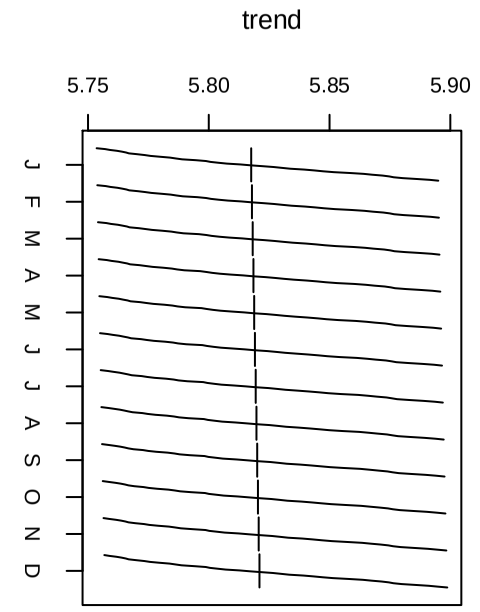

Squared Mahalanobis distances, n=100, p=3
Density
0.00
0.05
0.10
0.15
0.20
0
2
4
6
8
10
12
N = 100 Bandwidth = 0.5
help("mahalanobis")

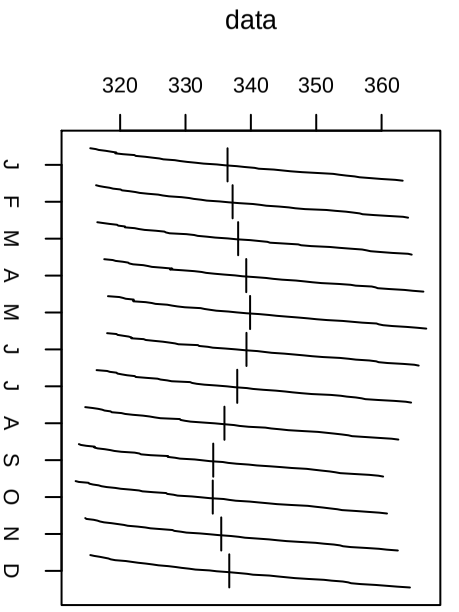

Q−Q plot of Mahalanobis D^2 vs. quantiles of χ^2_3
D2
qchisq(ppoints(100), df = 3)
0
2
4
6
8
10
12
help("mahalanobis")

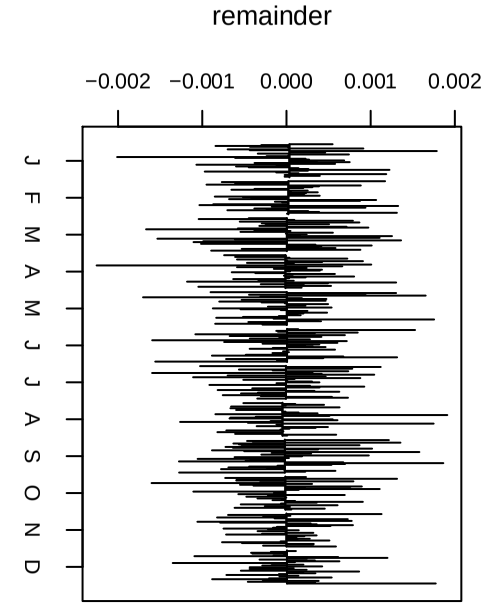

Weight (lb)
120
130
140
150
160
58
60
62
64
66
68
70
72
Height (in)
help("makepredictcall")

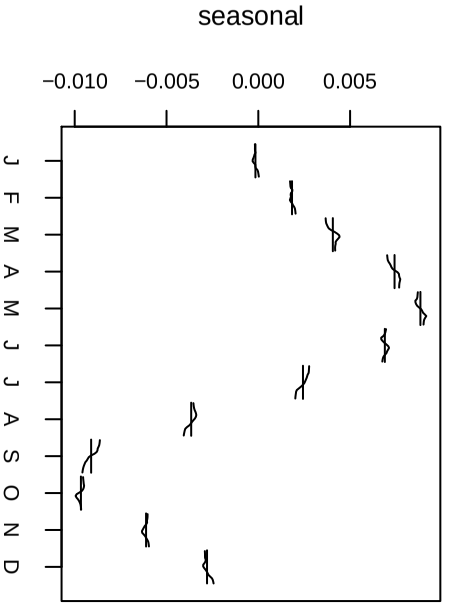

Tukey Additivity Plot
Residuals
4
2
0
−2
−4
−0.5
0.0
0.5
1.0
Diagnostic Comparison Values
help("medpolish")


remainder
trend
seasonal
data
5.75
5.80
5.85
5.90
5.75
5.80
5.85
5.90
1960
1970
1980
1990
time
−0.002
0.000
0.002
−0.010
0.000
help("monthplot")

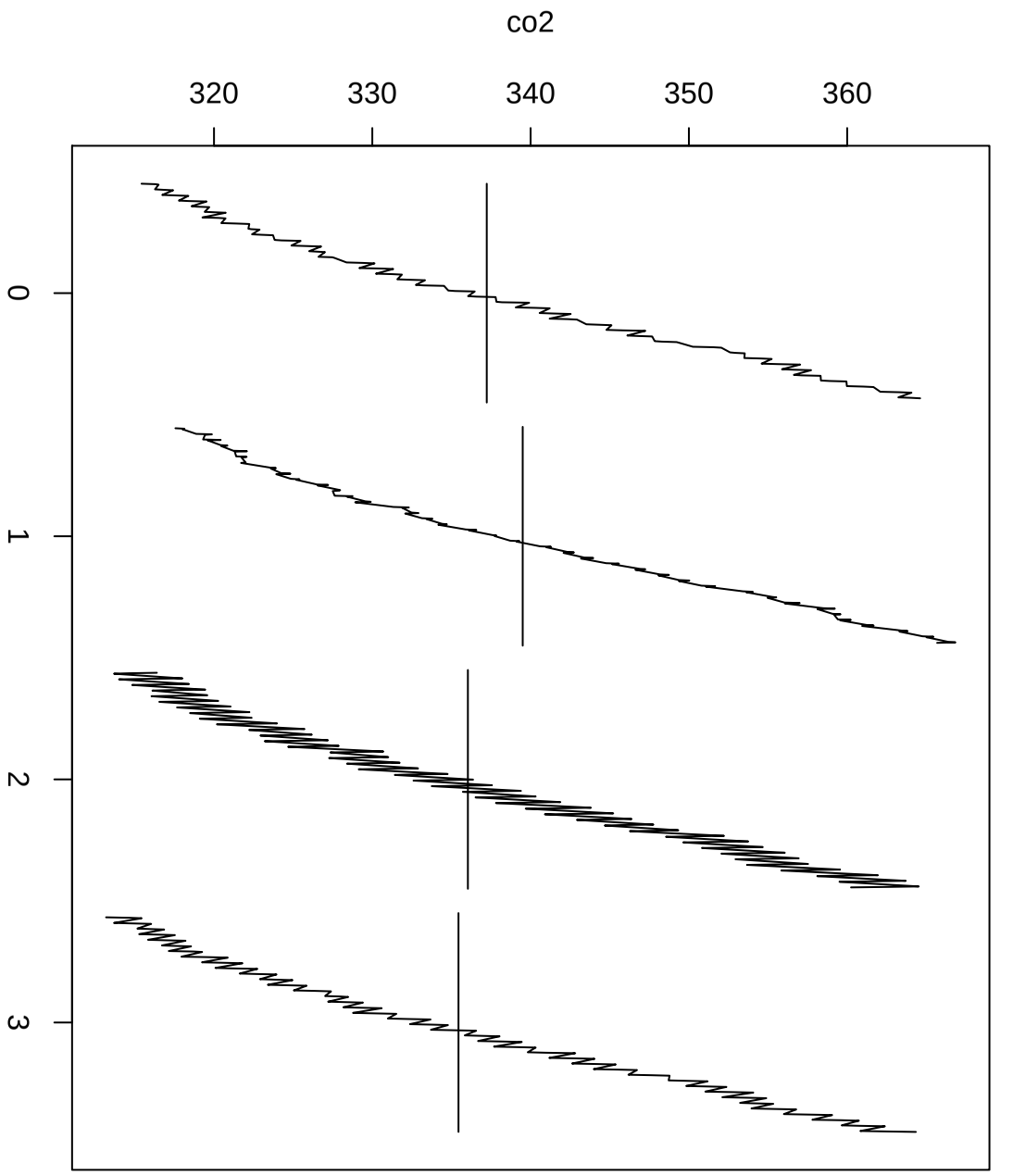




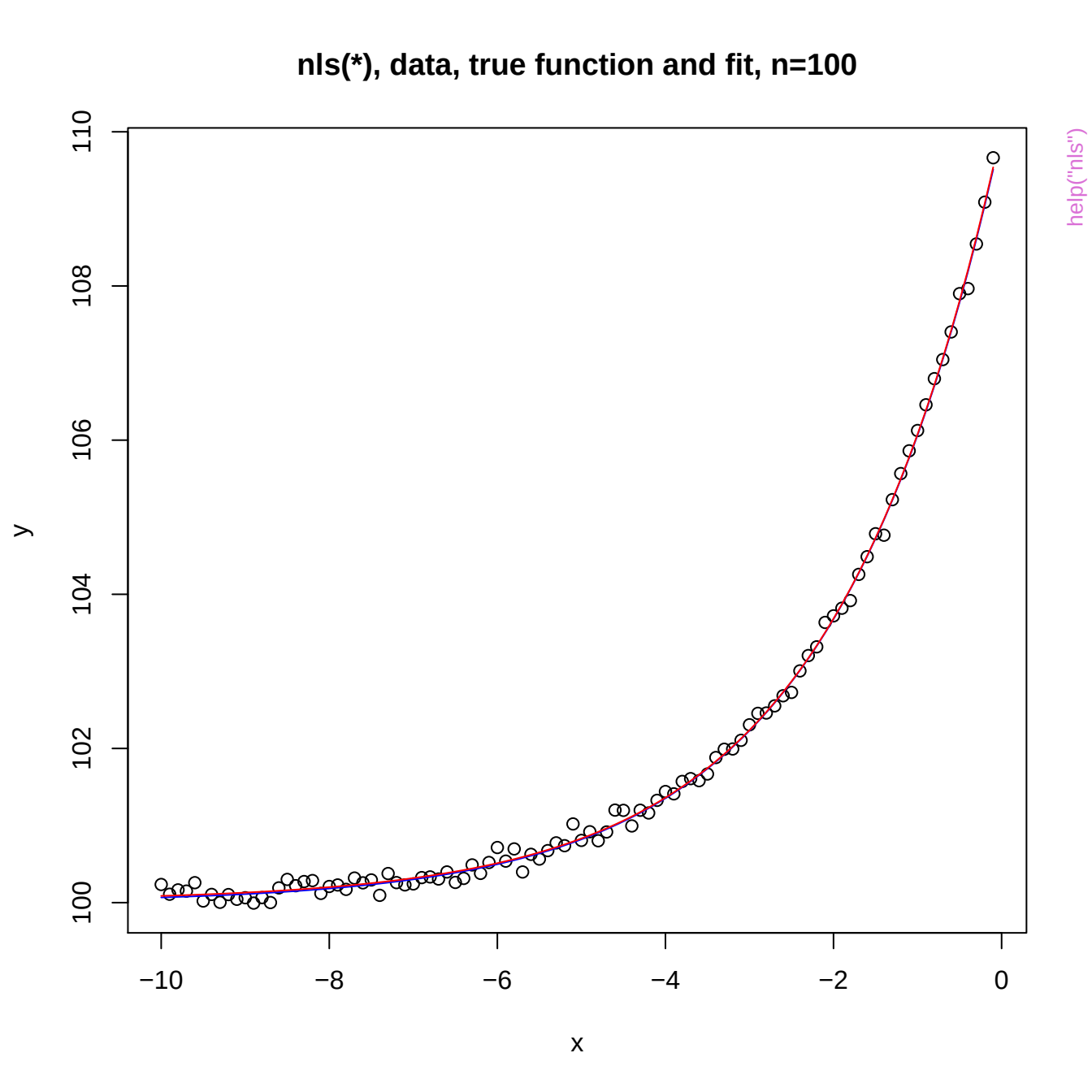


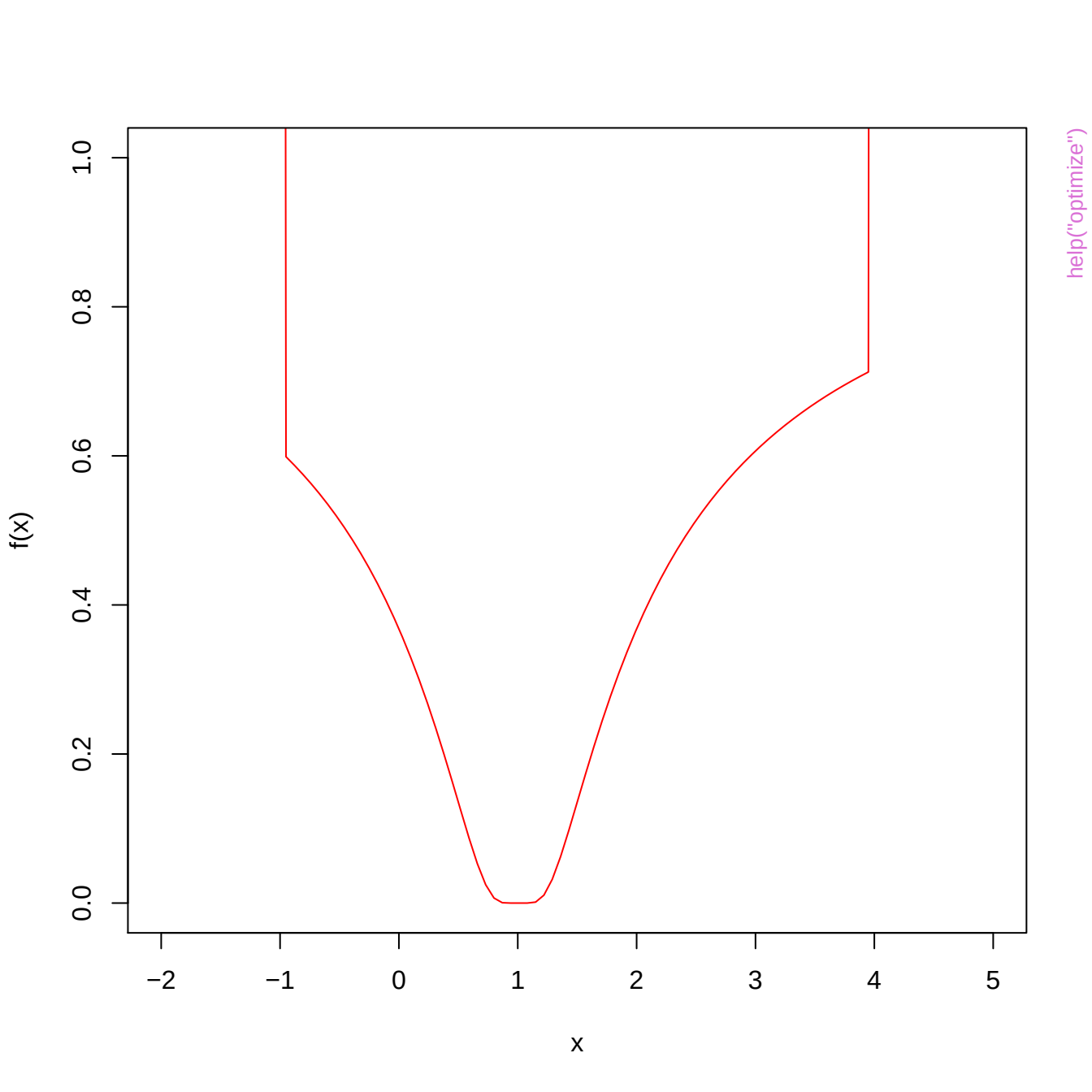


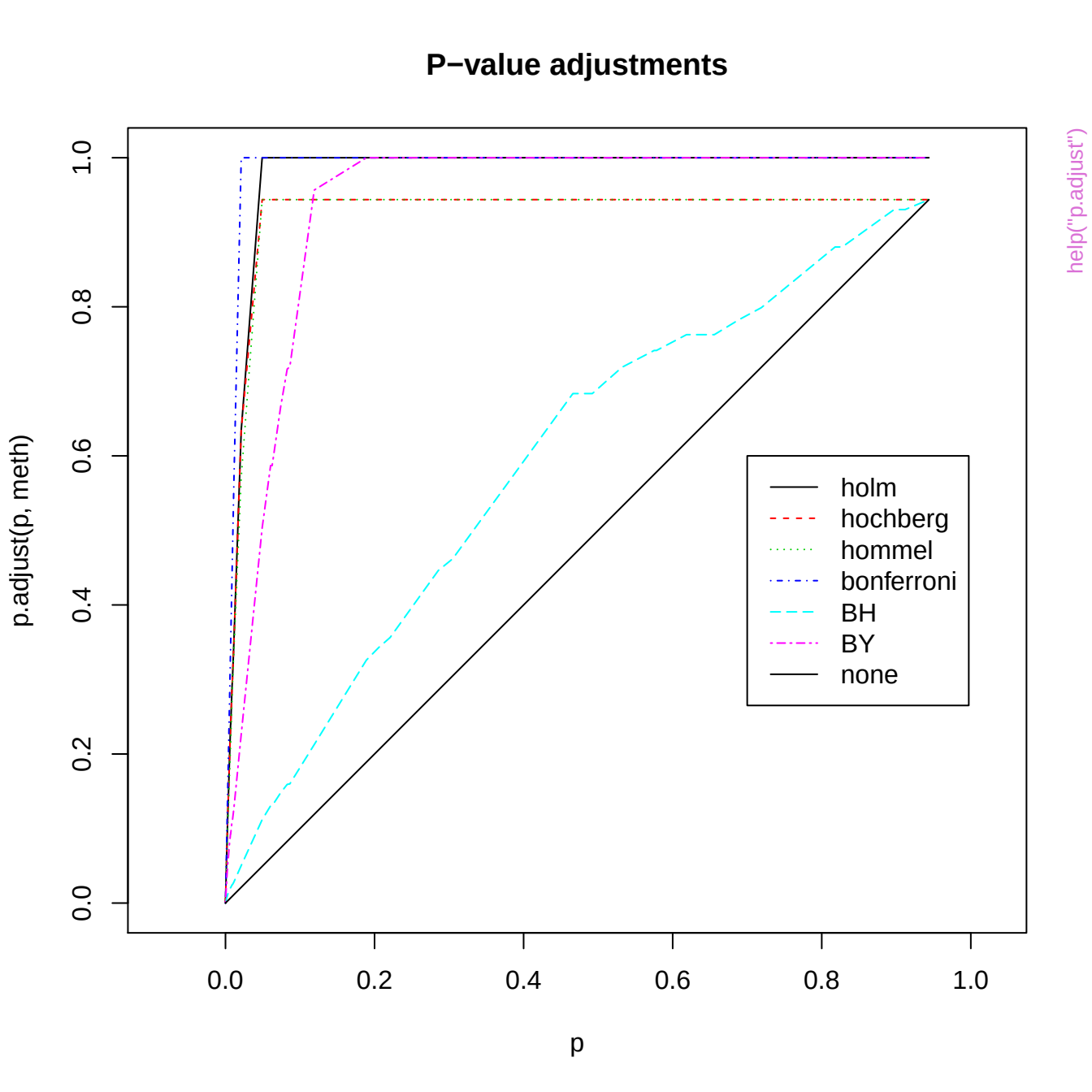
help("monthplot")

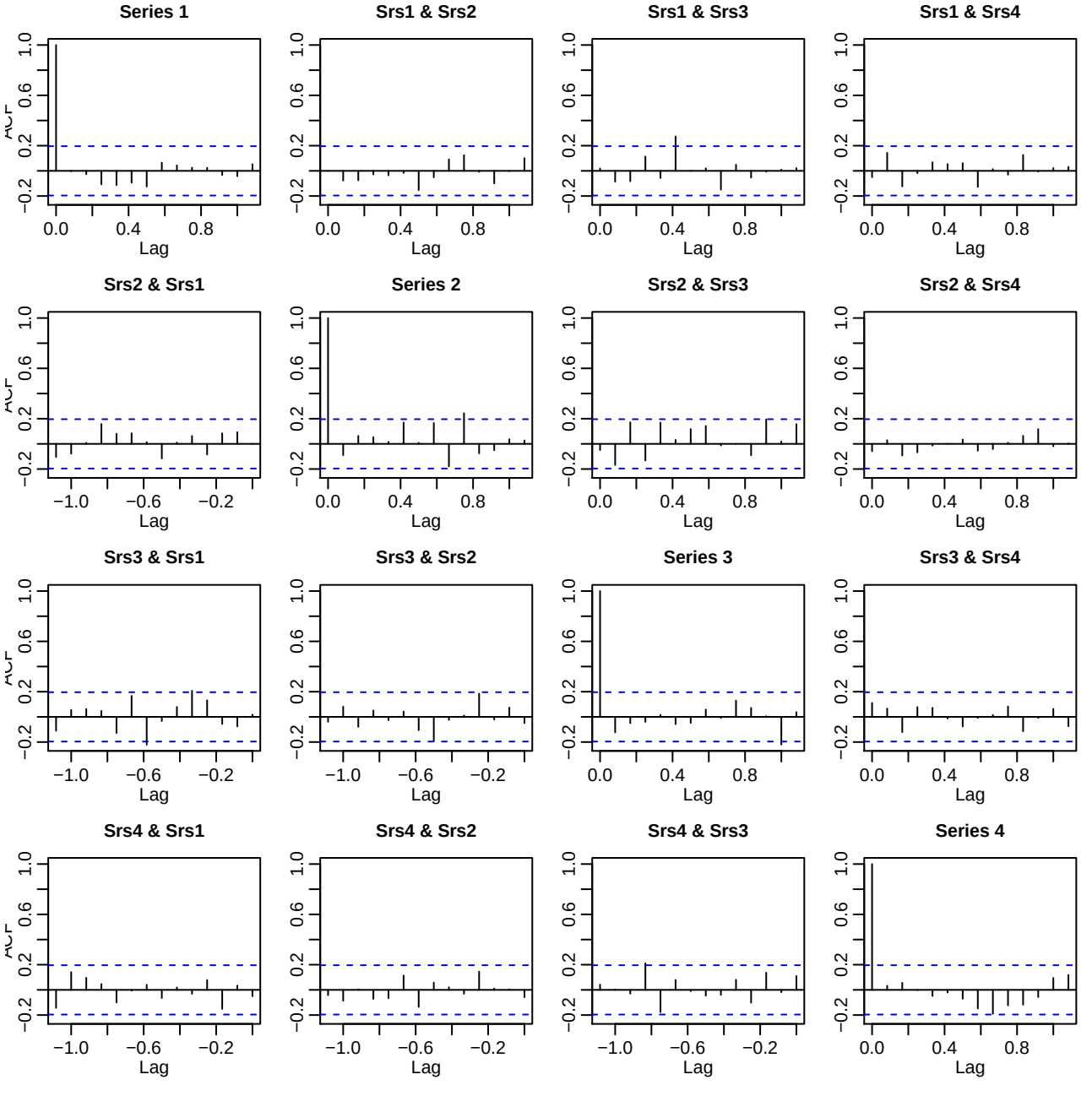


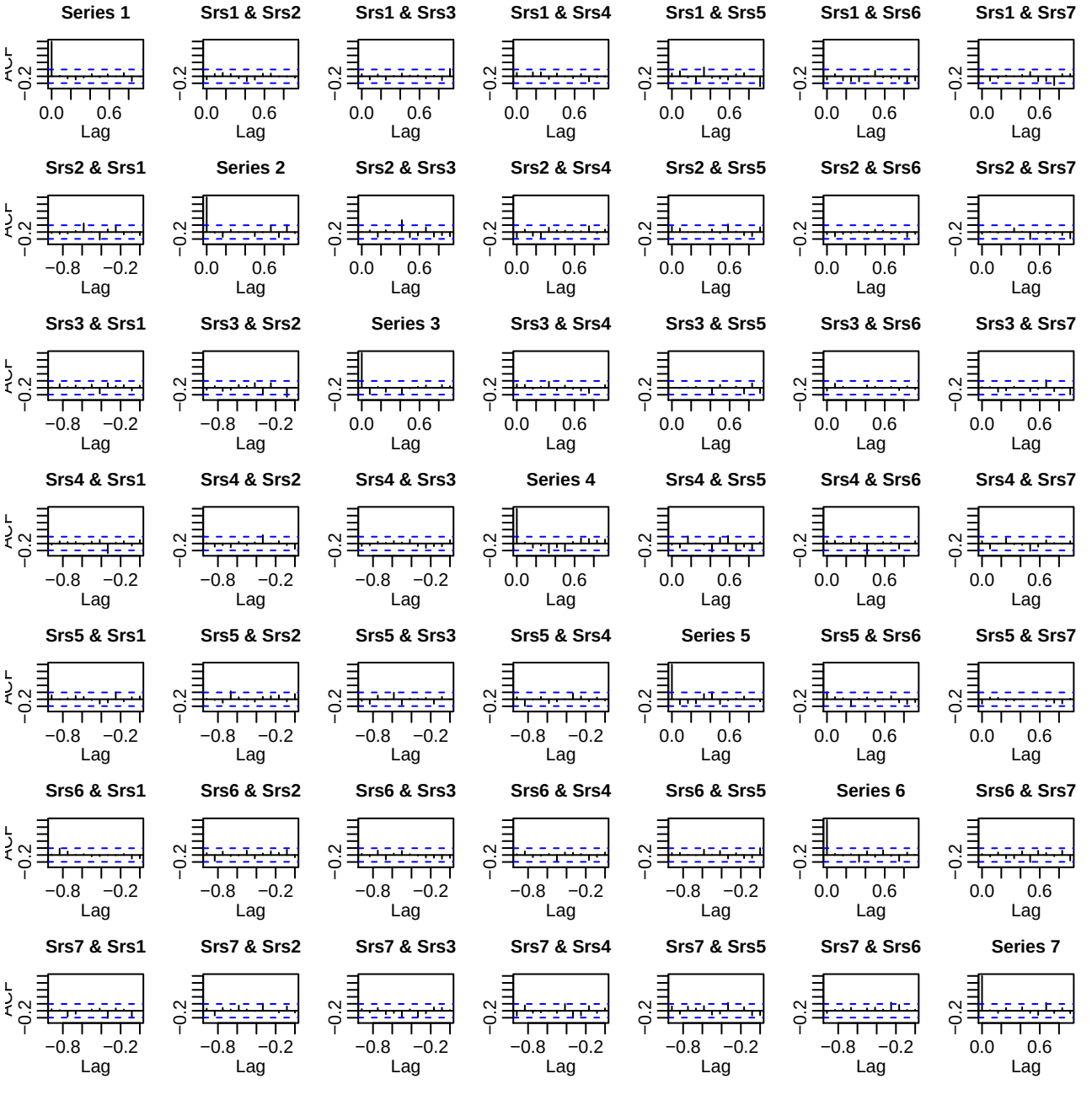
help("monthplot")

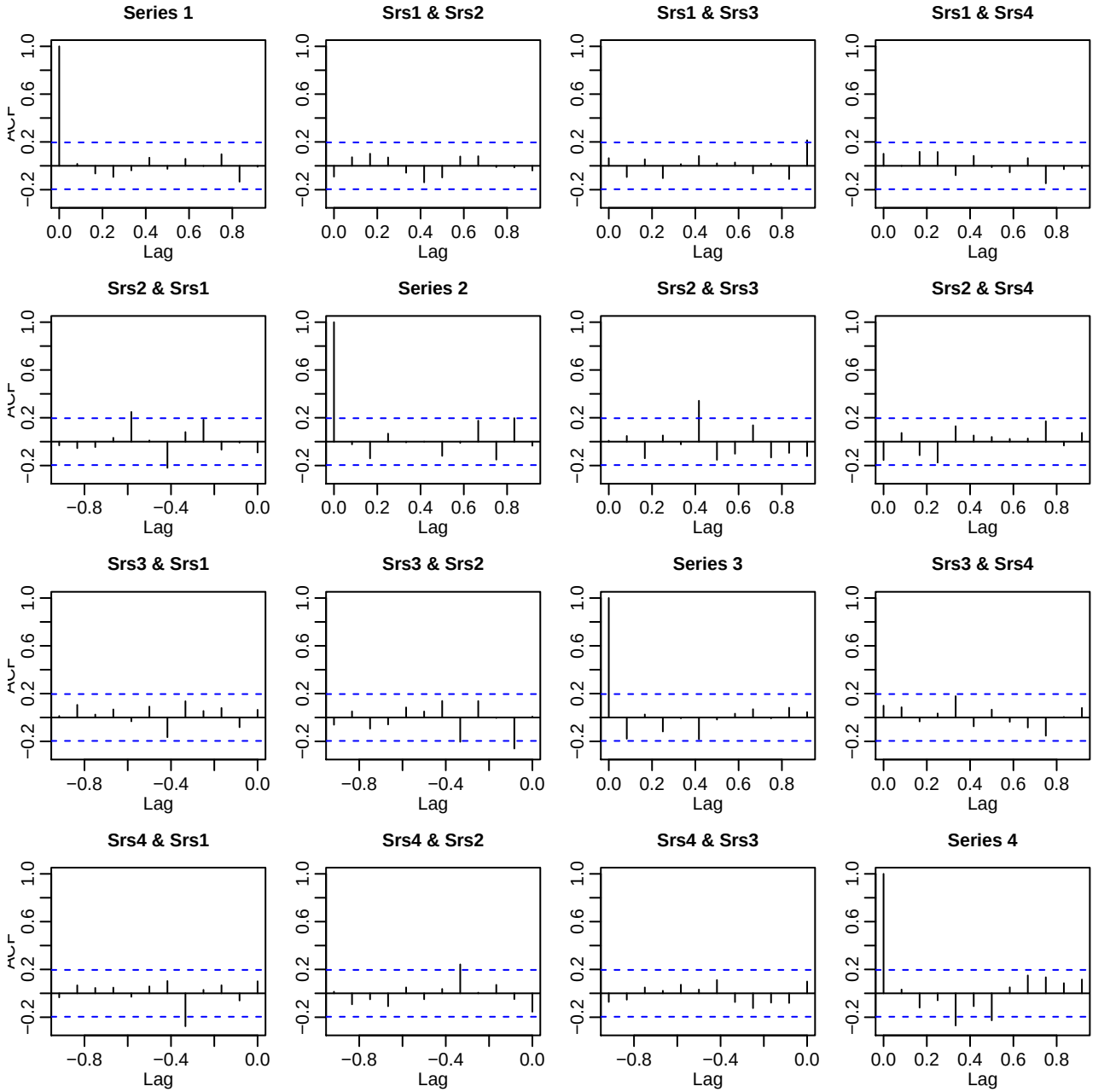

nls(*), data, true function and fit, n=100
y
x
100
102
104
106
108
110
−10
−8
−6
−4
−2
0
help("nls")


f(x)
1.0
0.8
0.6
0.4
0.2
0.0
−2
−1
0
1
2
3
4
5
x
help("optimize")

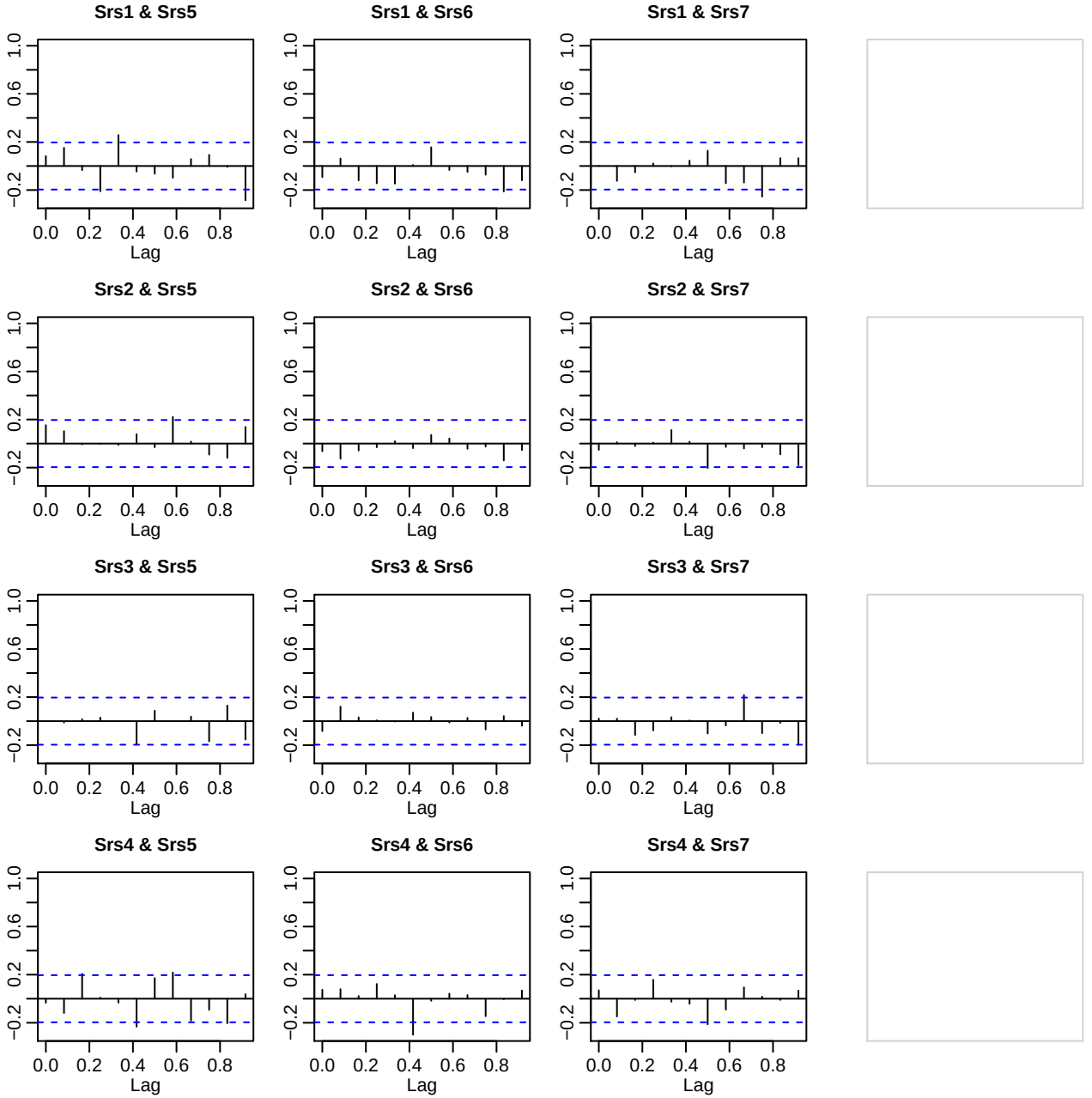

P−value adjustments
p.adjust(p, meth)
p
0.0
0.2
0.4
0.6
0.8
1.0
holm
hochberg
hommel
bonferroni
BH
BY
none
help("p.adjust")

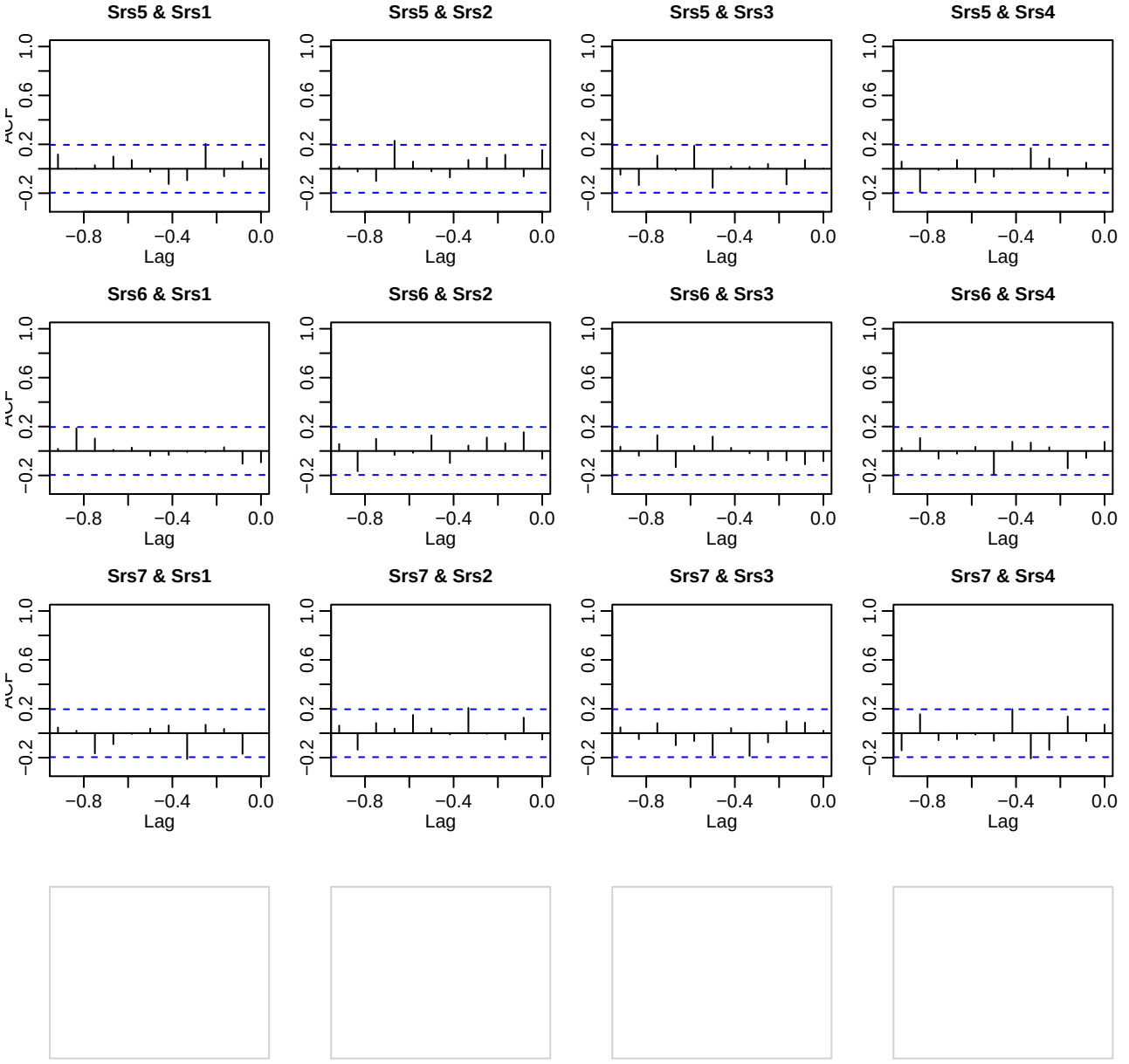

Series 1
Srs1 & Srs2
Srs1 & Srs3
Srs1 & Srs4
Srs2 & Srs1
Series 2
Srs2 & Srs3
Srs2 & Srs4
Srs3 & Srs1
Srs3 & Srs2
Series 3
Srs3 & Srs4
Srs4 & Srs1
Srs4 & Srs2
Srs4 & Srs3
Series 4
ACF
Lag

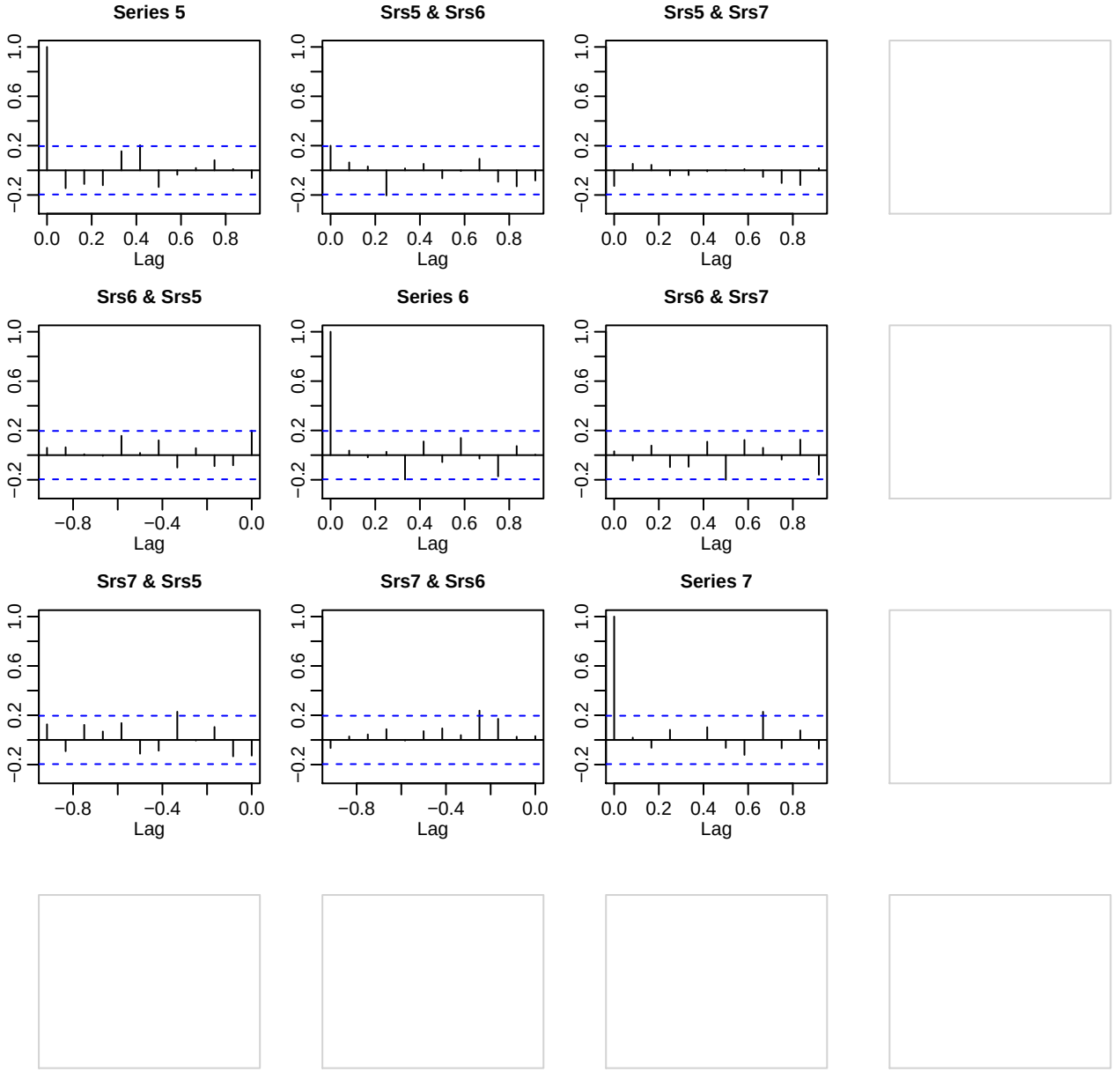

Series 1
Srs1 & Srs2
Srs1 & Srs3
Srs1 & Srs4
Srs1 & Srs5
Srs1 & Srs6
Srs1 & Srs7
Srs2 & Srs1
Series 2
Srs2 & Srs3
Srs2 & Srs4
Srs2 & Srs5
Srs2 & Srs6
Srs2 & Srs7
Srs3 & Srs1
Srs3 & Srs2
Series 3
Srs3 & Srs4
Srs3 & Srs5
Srs3 & Srs6
Srs3 & Srs7
Srs4 & Srs1
Srs4 & Srs2
Srs4 & Srs3
Series 4
Srs4 & Srs5
Srs4 & Srs6
Srs4 & Srs7
Srs5 & Srs1
Srs5 & Srs2
Srs5 & Srs3
Srs5 & Srs4
Series 5
Srs5 & Srs6
Srs5 & Srs7
Srs6 & Srs1
Srs6 & Srs2
Srs6 & Srs3
Srs6 & Srs4
Srs6 & Srs5
Series 6
Srs6 & Srs7
Srs7 & Srs1
Srs7 & Srs2
Srs7 & Srs3
Srs7 & Srs4
Srs7 & Srs5
Srs7 & Srs6
Series 7
ACF
−0.2
0.0
0.6
−0.8
−0.2
Lag

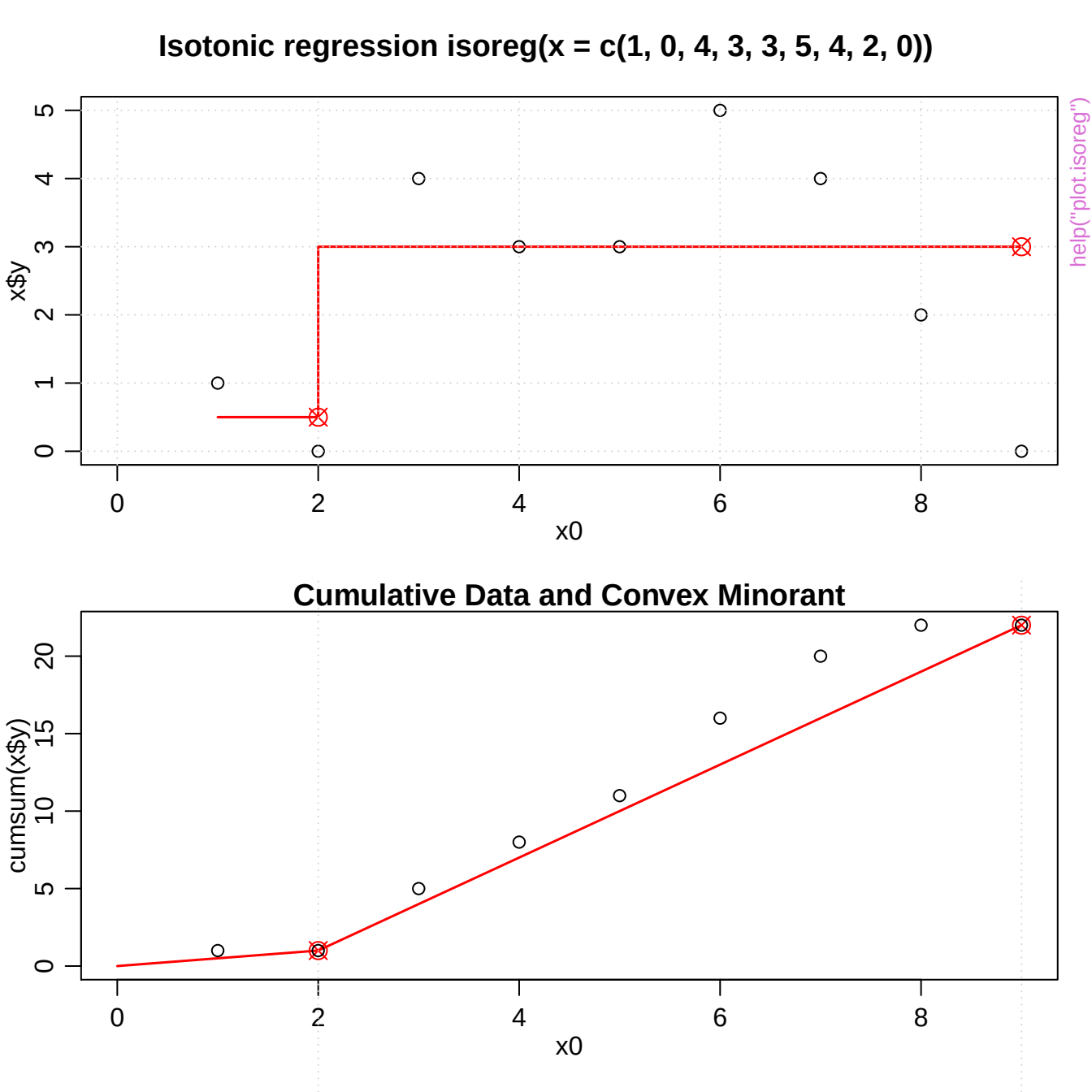

Series 1
Srs1 & Srs2
Srs1 & Srs3
Srs1 & Srs4
Srs2 & Srs1
Series 2
Srs2 & Srs3
Srs2 & Srs4
Srs3 & Srs1
Srs3 & Srs2
Series 3
Srs3 & Srs4
Srs4 & Srs1
Srs4 & Srs2
Srs4 & Srs3
Series 4
ACF
Lag

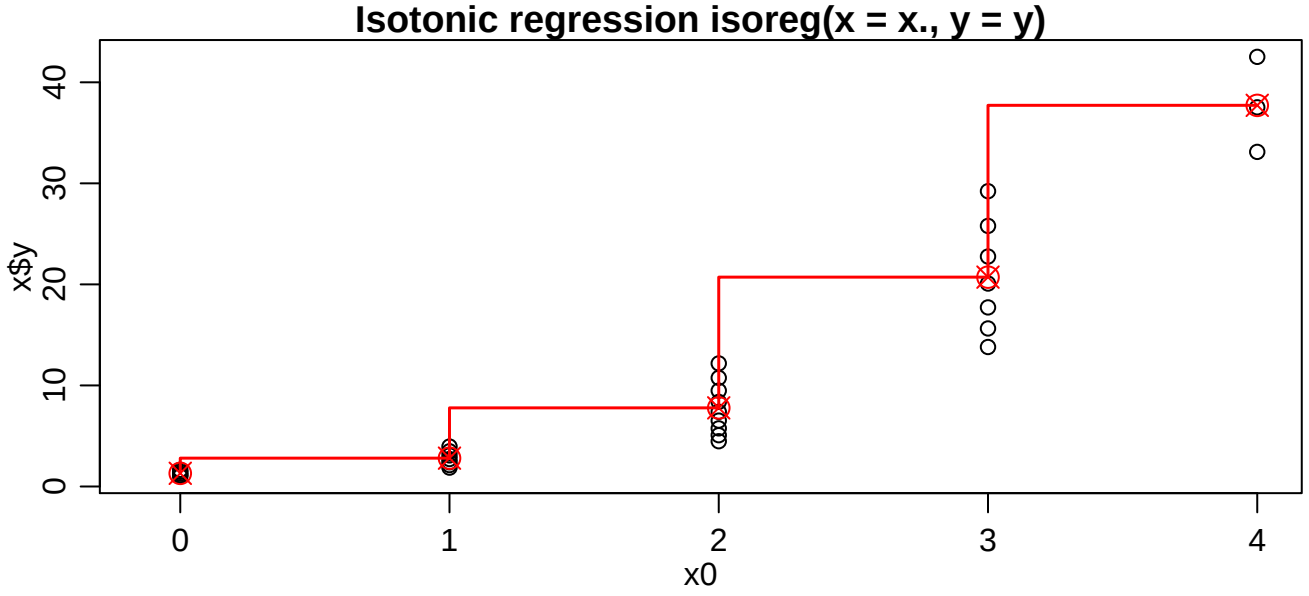
[1,1]

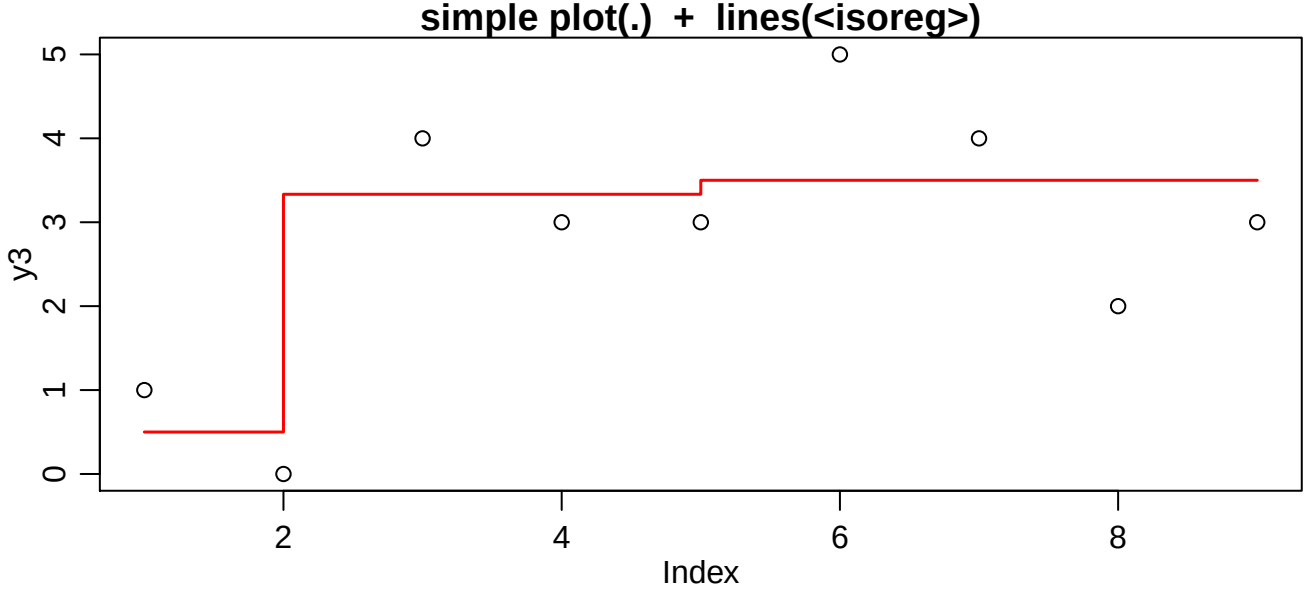

Srs1 & Srs5
Srs1 & Srs6
Srs1 & Srs7
Srs2 & Srs5
Srs2 & Srs6
Srs2 & Srs7
Srs3 & Srs5
Srs3 & Srs6
Srs3 & Srs7
Srs4 & Srs5
Srs4 & Srs6
Srs4 & Srs7
1.0
0.6
0.2
−0.2
0.0 0.2 0.4 0.6 0.8
Lag

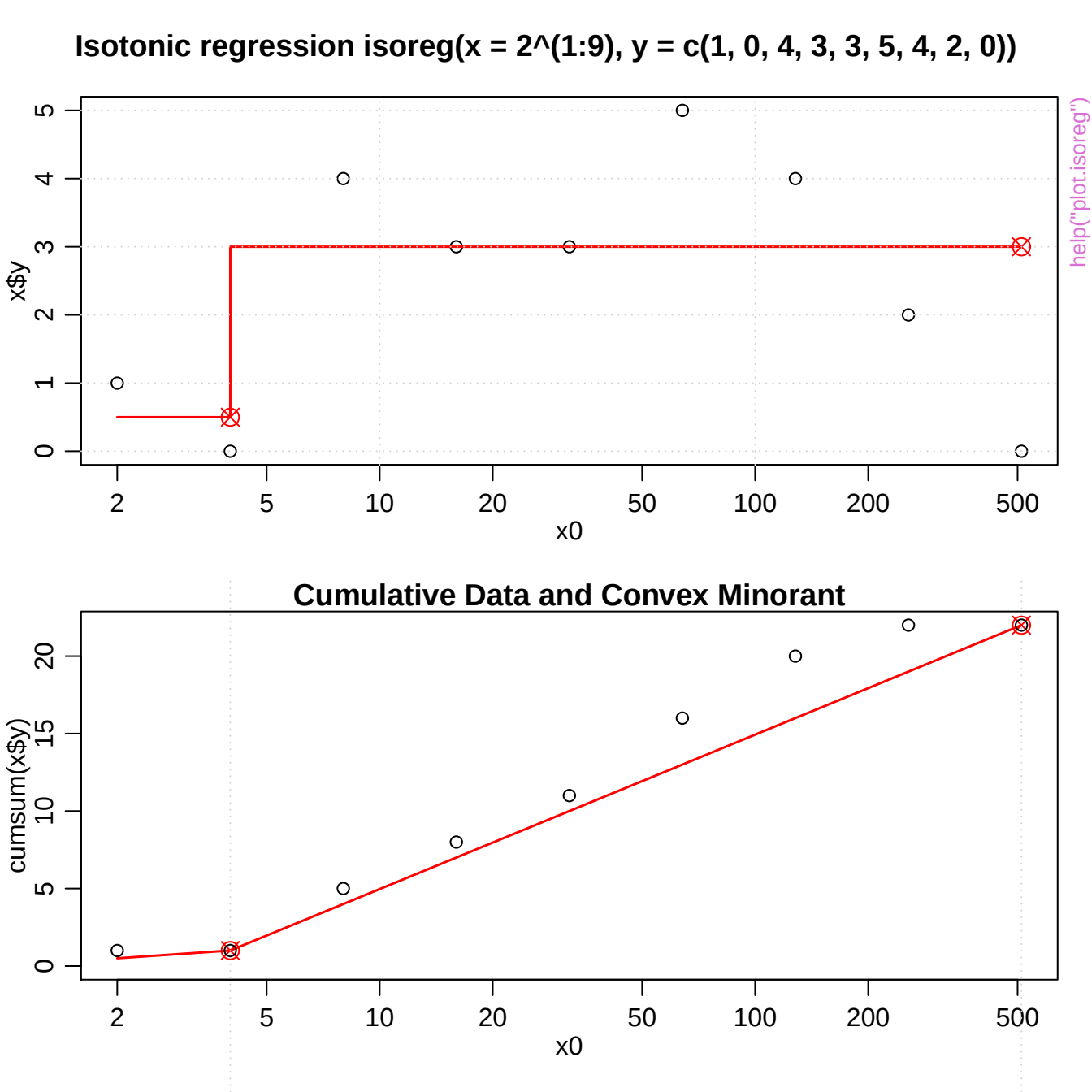

Srs5 & Srs1
Srs5 & Srs2
Srs5 & Srs3
Srs5 & Srs4
Srs6 & Srs1
Srs6 & Srs2
Srs6 & Srs3
Srs6 & Srs4
Srs7 & Srs1
Srs7 & Srs2
Srs7 & Srs3
Srs7 & Srs4
ACF
1.0
0.6
0.2
−0.2
−0.8
−0.4
0.0
Lag

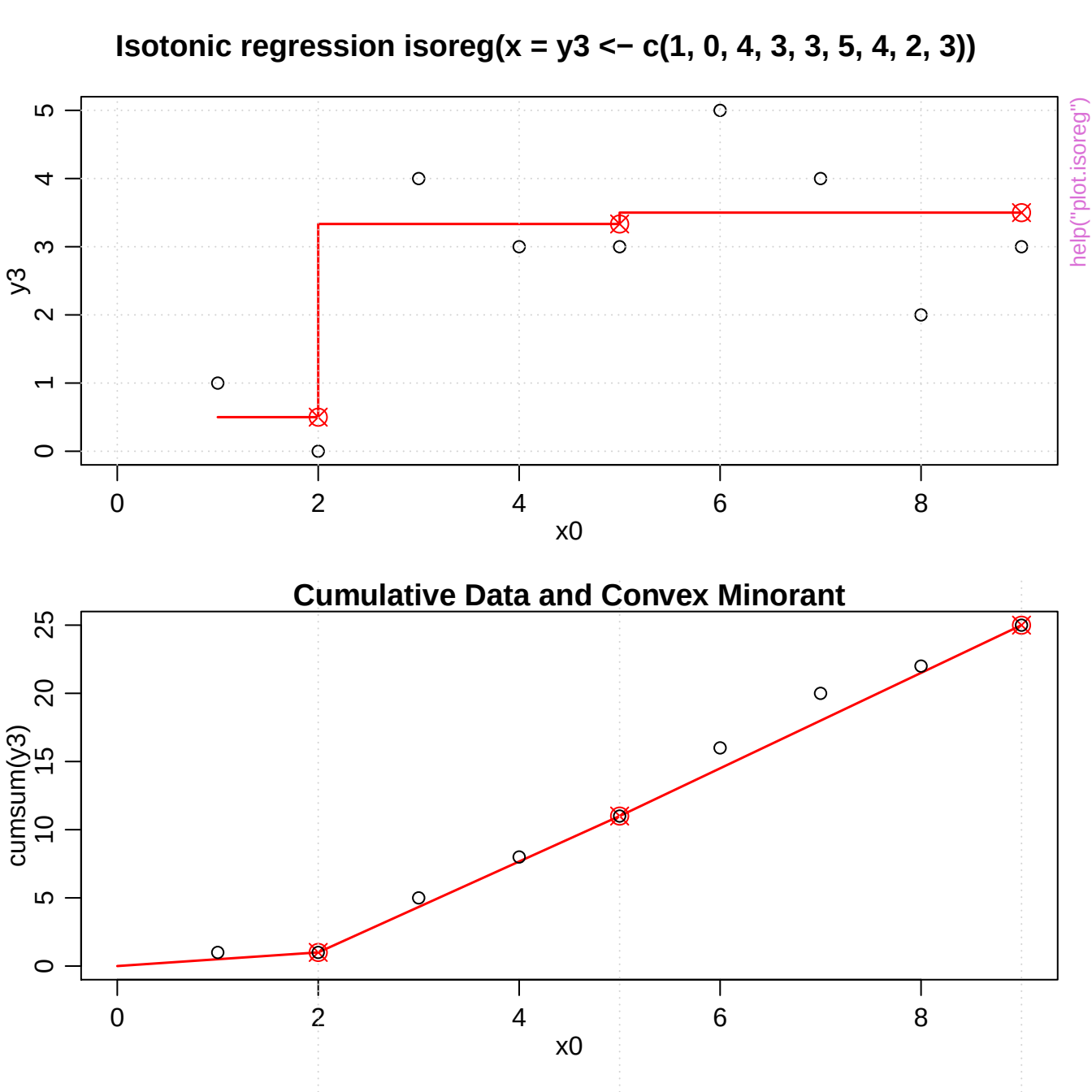

Series 5
Srs5 & Srs6
Srs5 & Srs7
Srs6 & Srs5
Series 6
Srs6 & Srs7
Srs7 & Srs5
Srs7 & Srs6
Series 7
Lag
1.0
0.6
0.2
−0.2
0.0
0.2
0.4
0.6
0.8
−0.8
−0.4

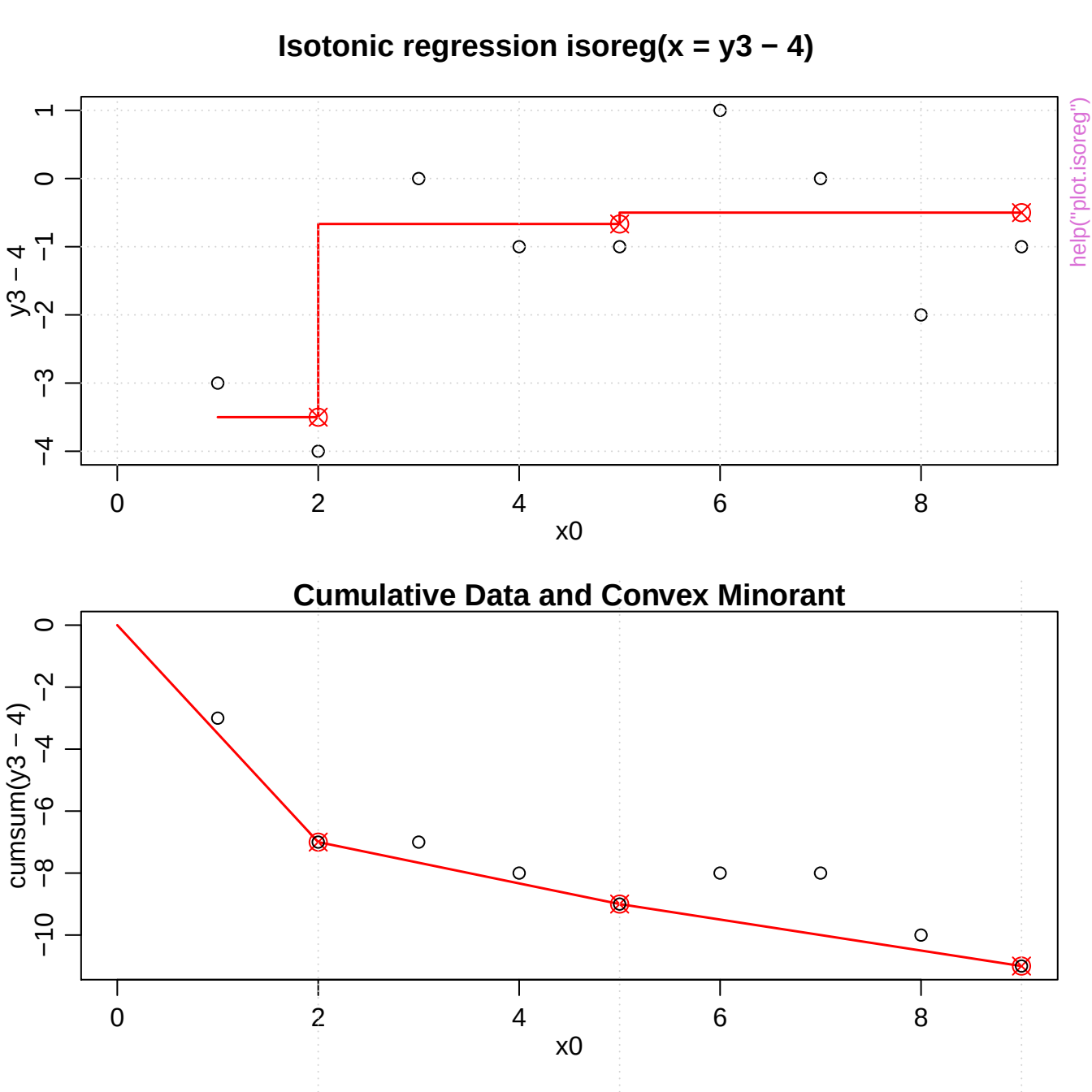

Isotonic regression isoreg(x = c(1, 0, 4, 3, 3, 5, 4, 2, 0))
x$y
x0
help("plot.isoreg")
Cumulative Data and Convex Minorant
cumsum(x$y)
x0

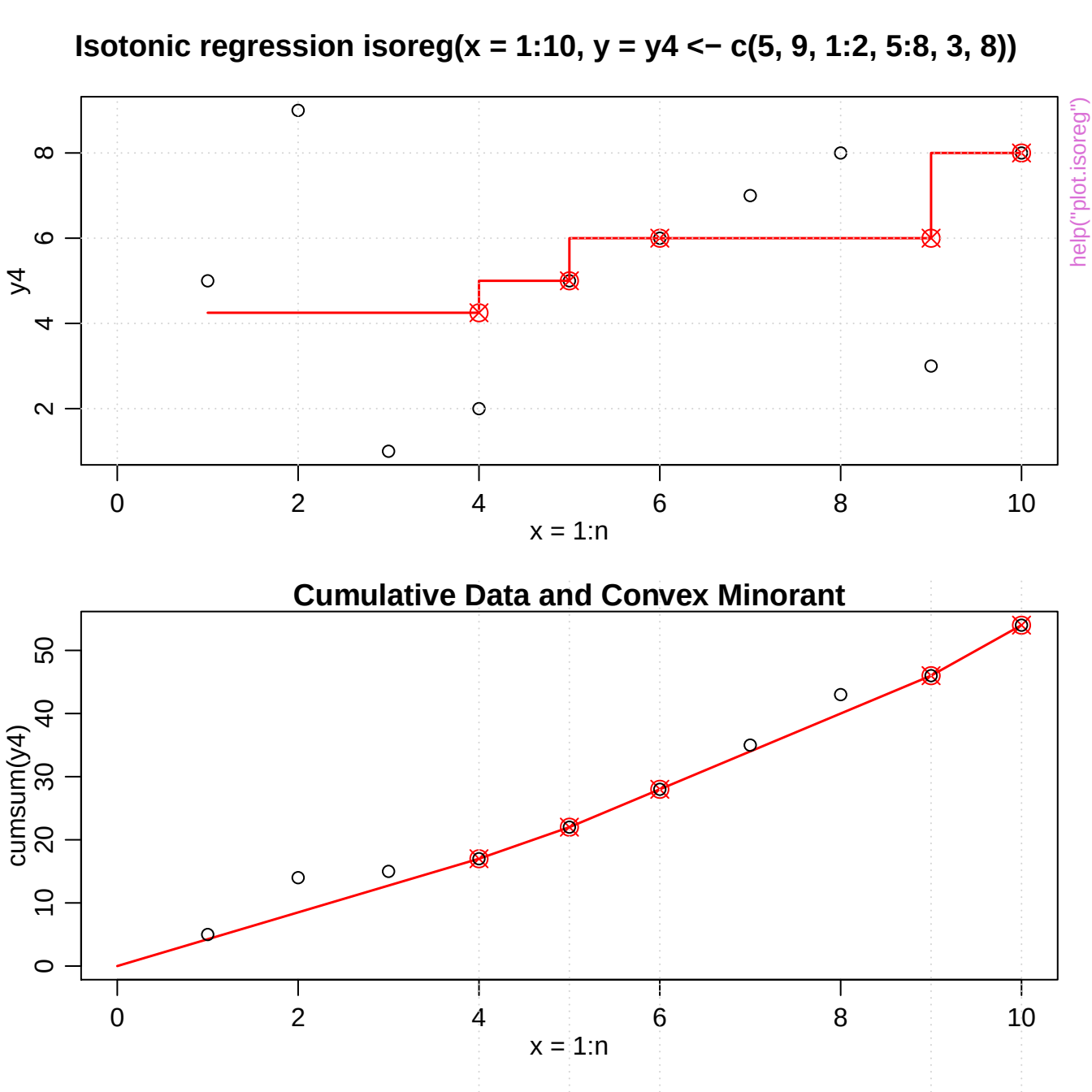

Isotonic regression isoreg(x = x., y = y)
x$y
x0
help("plot.isoreg")

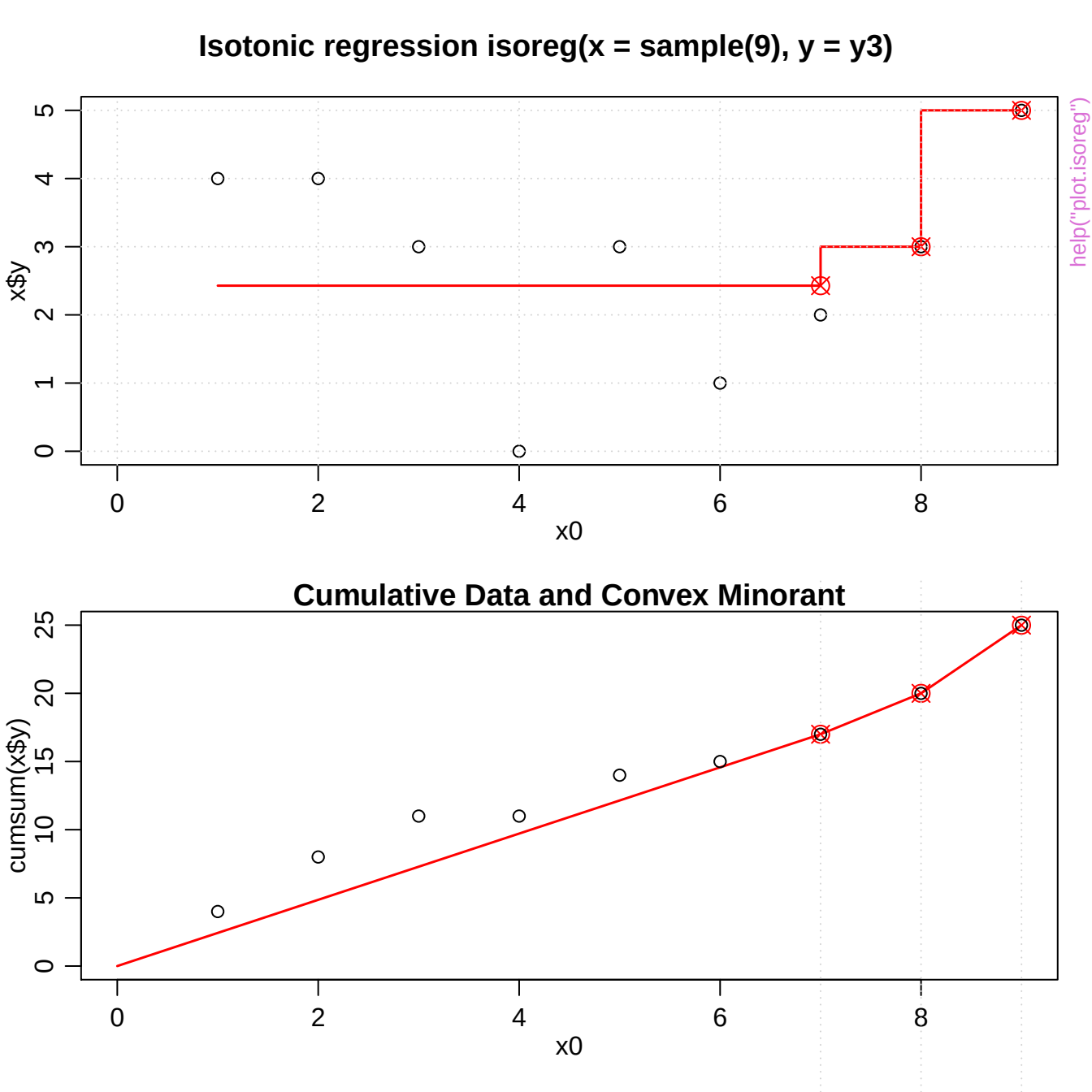

simple plot(.) + lines(<isoreg>)
y3
Index

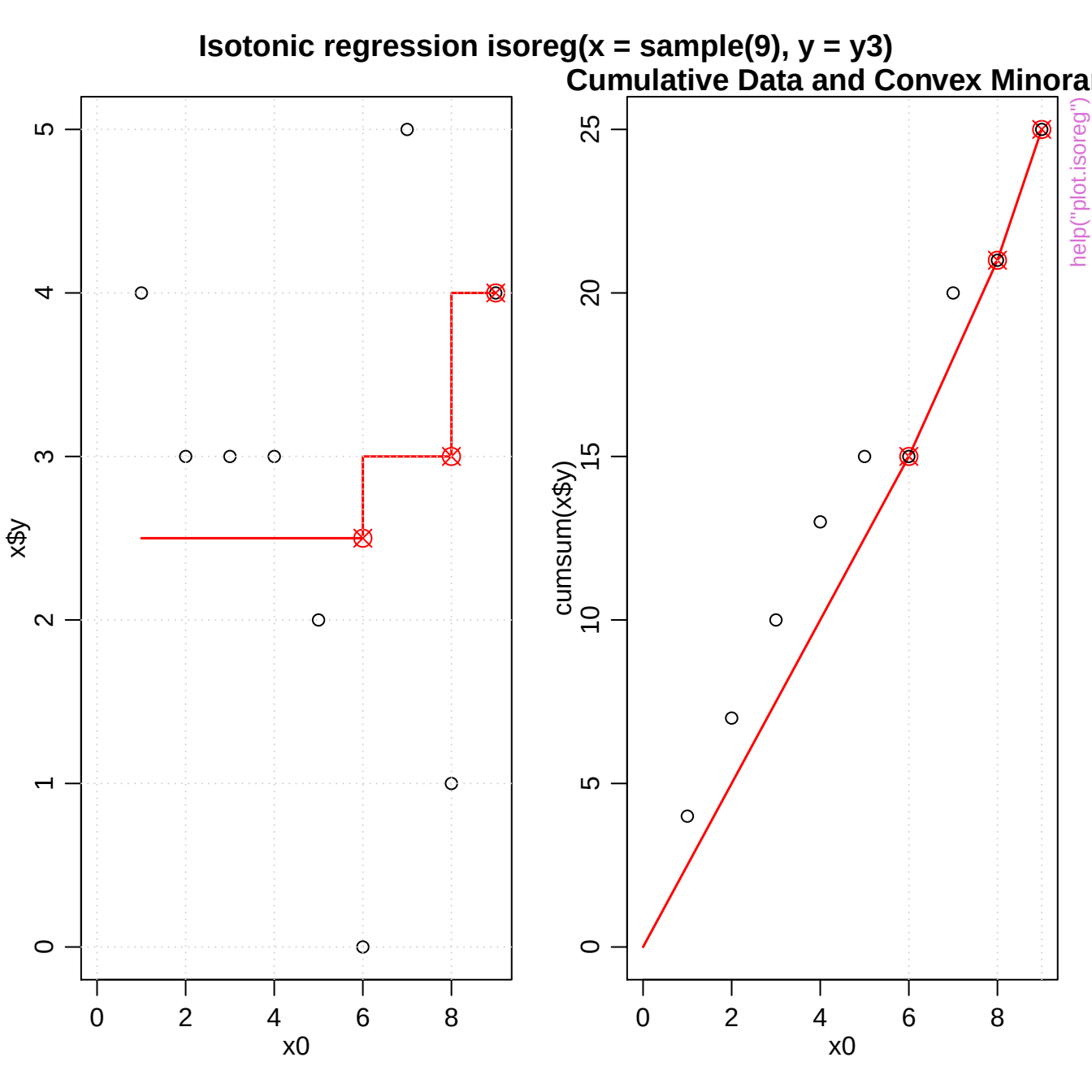

Isotonic regression isoreg(x = 2^(1:9), y = c(1, 0, 4, 3, 3, 5, 4, 2, 0))
x$y
x0
help("plot.isoreg")
Cumulative Data and Convex Minorant
cumsum(x$y)
x0

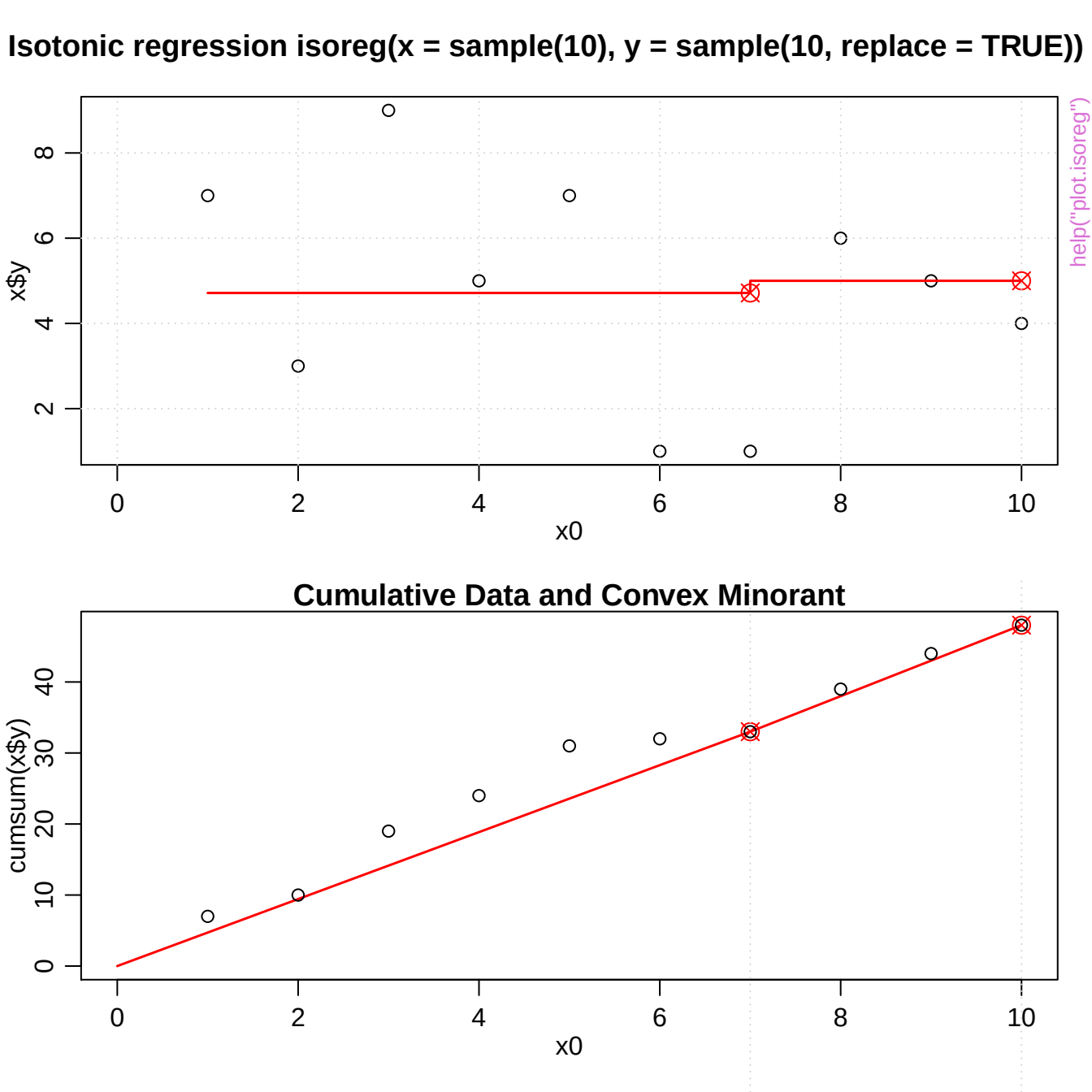

Isotonic regression isoreg(x = y3 <− c(1, 0, 4, 3, 3, 5, 4, 2, 3))
y3
x0
help("plot.isoreg")
Cumulative Data and Convex Minorant
cumsum(y3)
x0

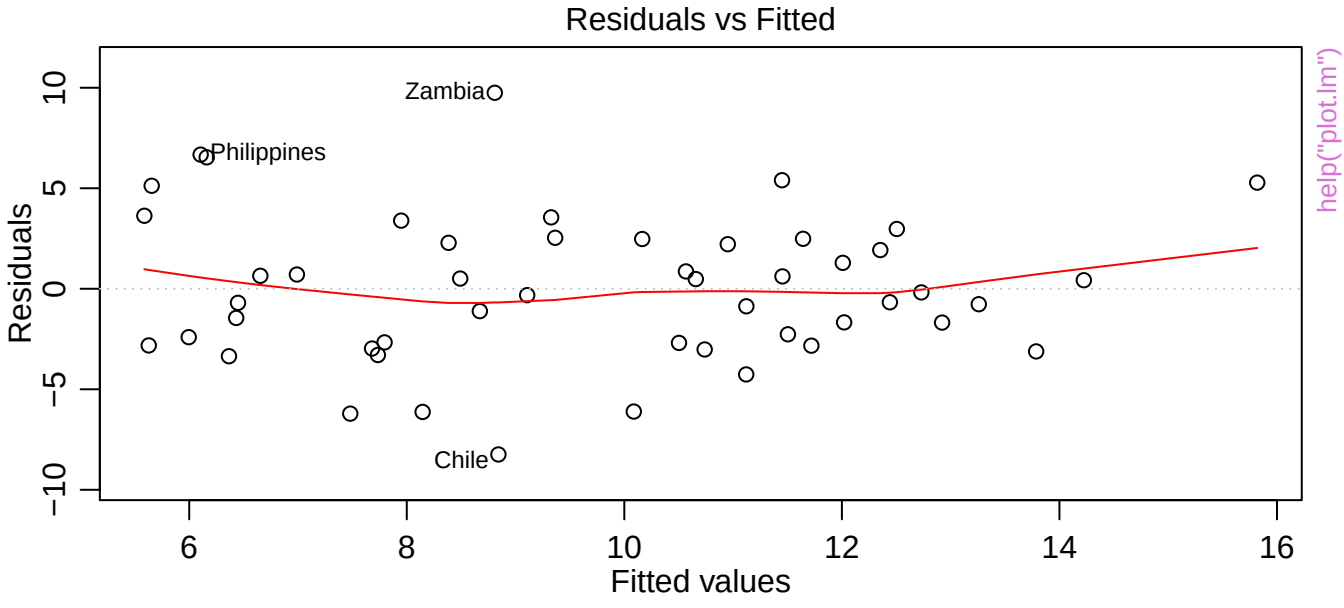

Isotonic regression isoreg(x = y3 − 4)
y3 − 4
x0
help("plot.isoreg")
Cumulative Data and Convex Minorant
cumsum(y3 − 4)
x0

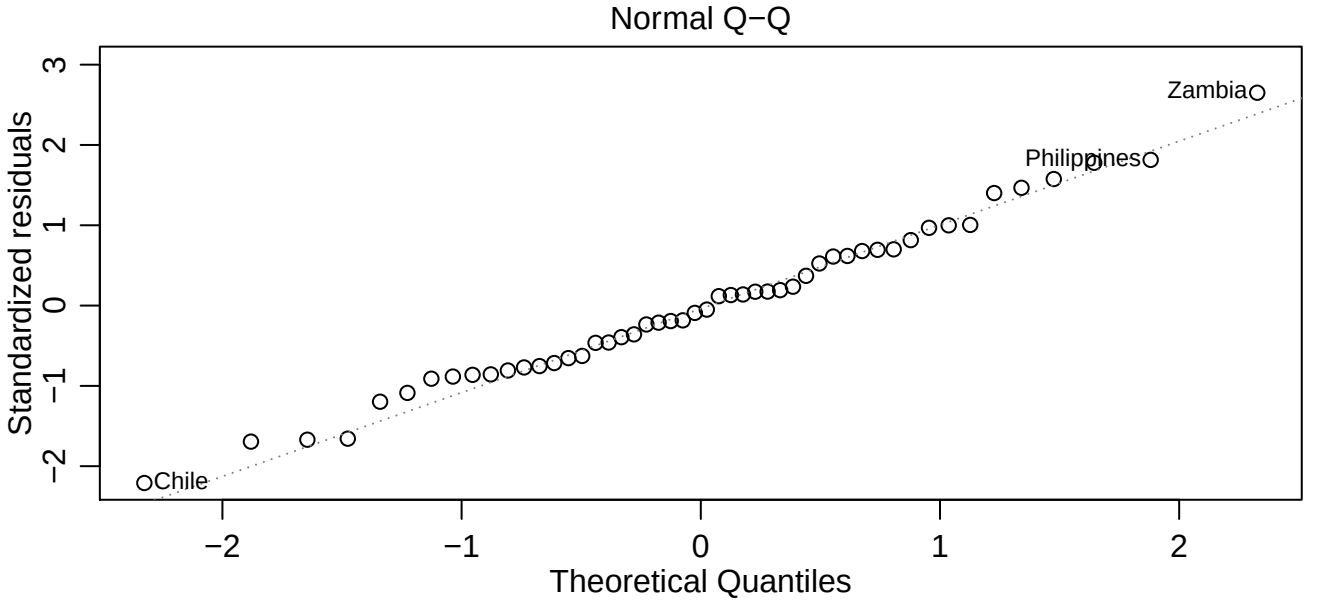

Isotonic regression isoreg(x = 1:10, y = y4 <− c(5, 9, 1:2, 5:8, 3, 8))
y4
x = 1:n
help("plot.isoreg")
Cumulative Data and Convex Minorant
cumsum(y4)
x = 1:n

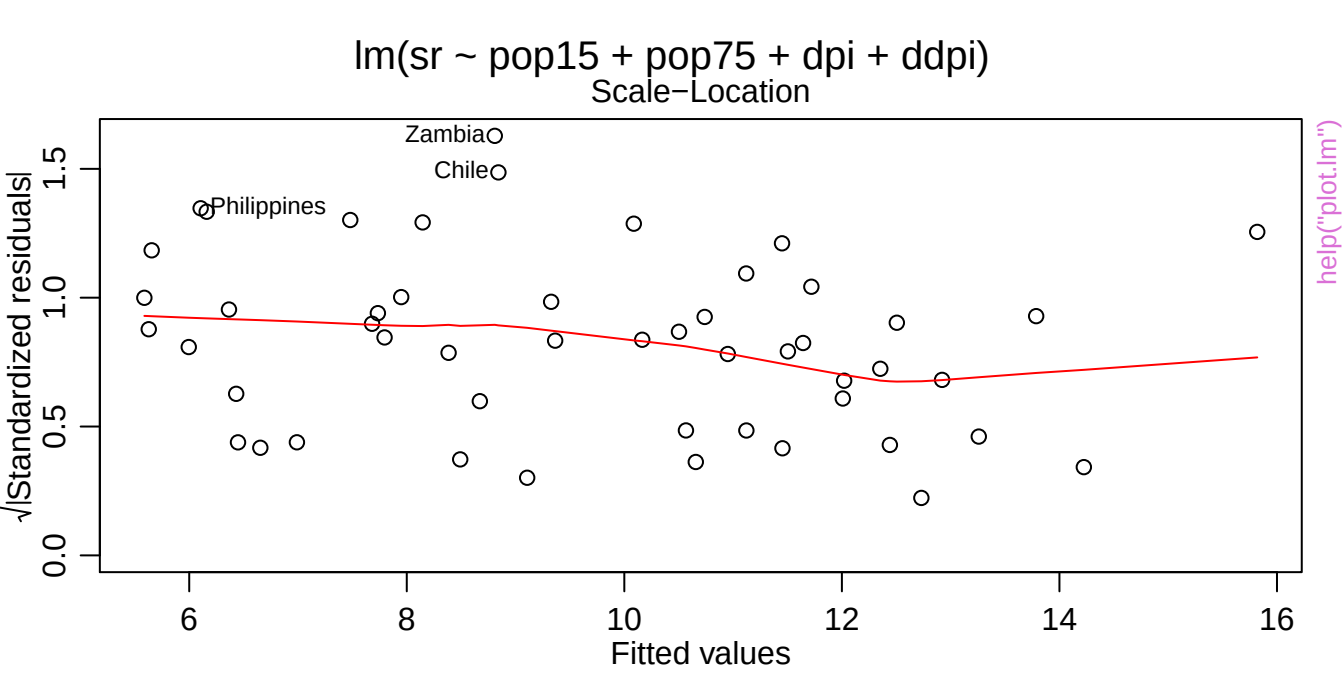

Isotonic regression isoreg(x = sample(9), y = y3)
x$y
x0
help("plot.isoreg")
Cumulative Data and Convex Minorant
cumsum(x$y)
x0

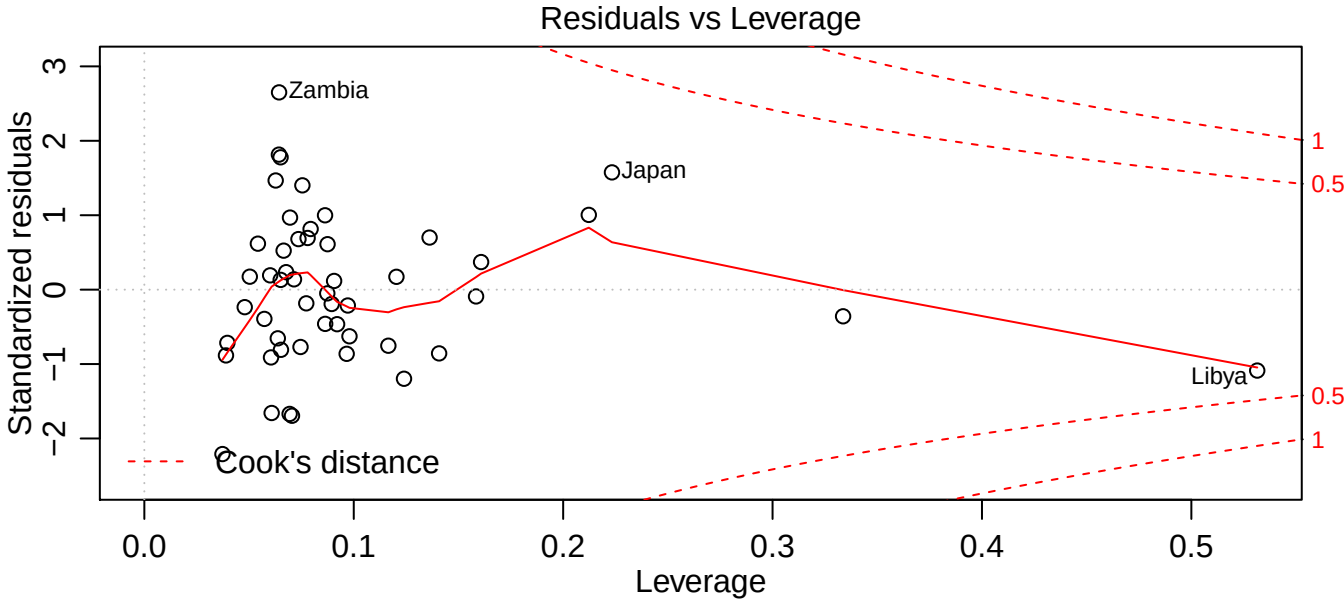

Isotonic regression isoreg(x = sample(9), y = y3)
Cumulative Data and Convex Minora
x$y
x0
cumsum(x$y)
x0
help("plot.isoreg")

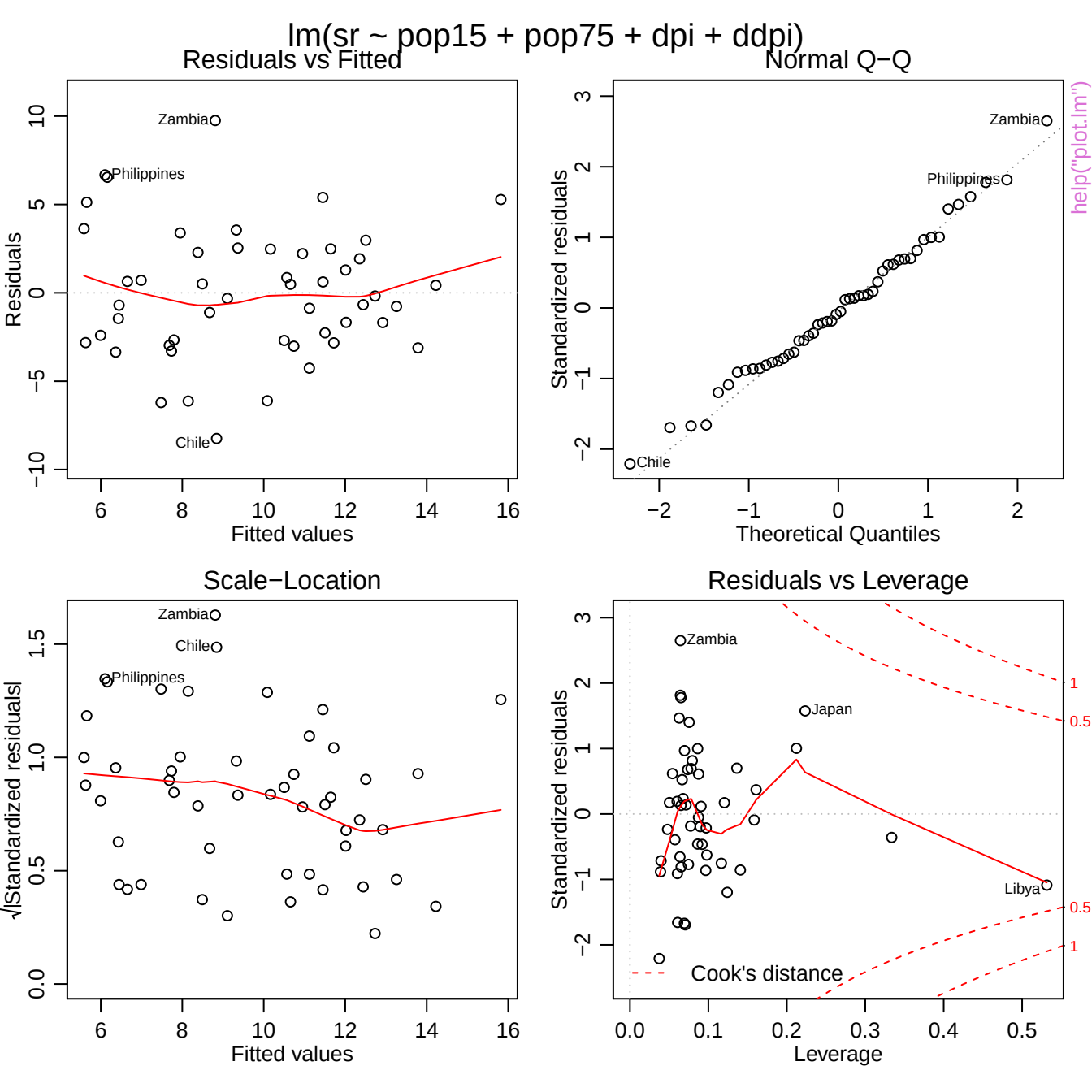

Isotonic regression isoreg(x = sample(10), y = sample(10, replace = TRUE))
x$y
x0
help("plot.isoreg")
Cumulative Data and Convex Minorant
cumsum(x$y)
x0

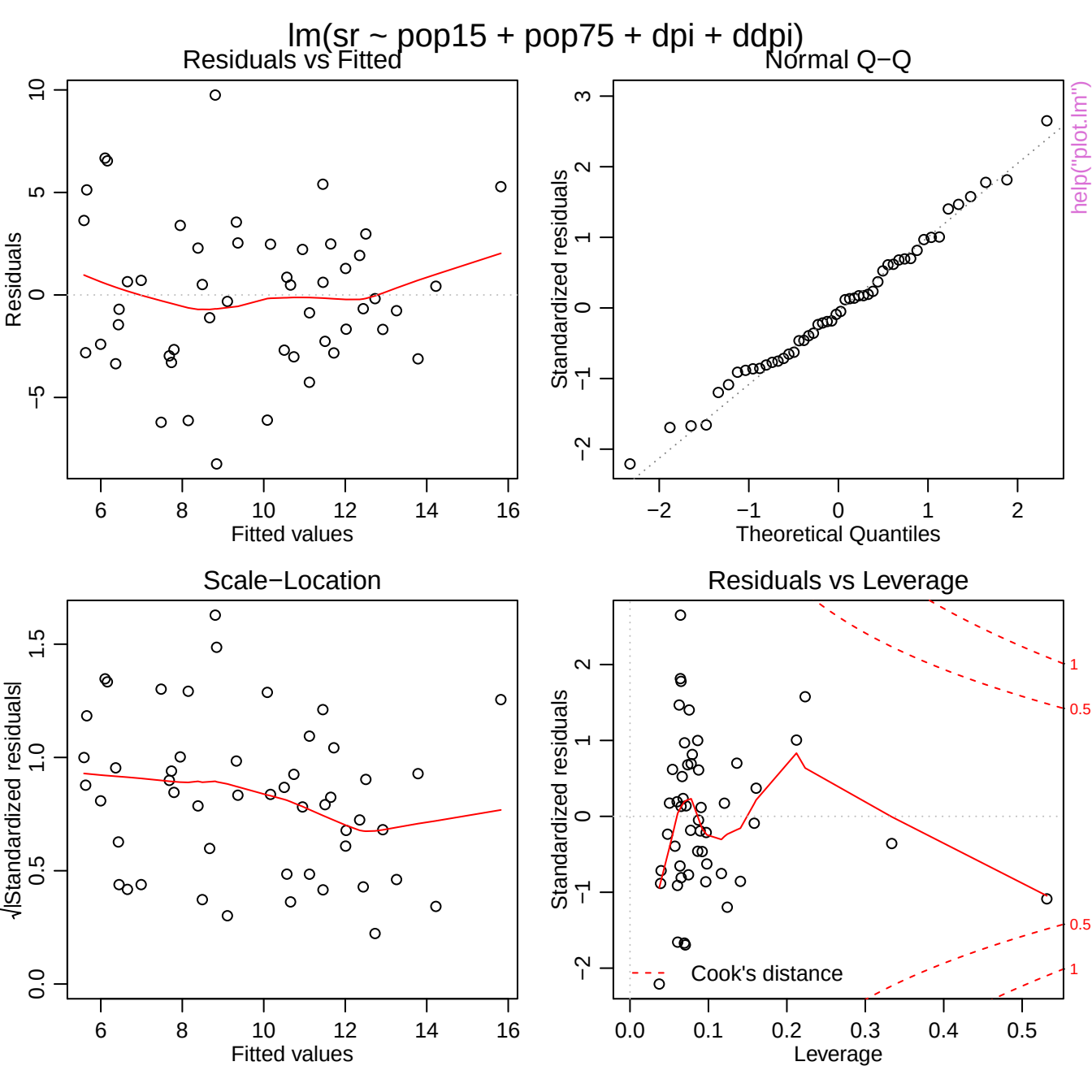

Residuals vs Fitted
Zambia
Philippines
Chile
Residuals
Fitted values
help("plot.lm")

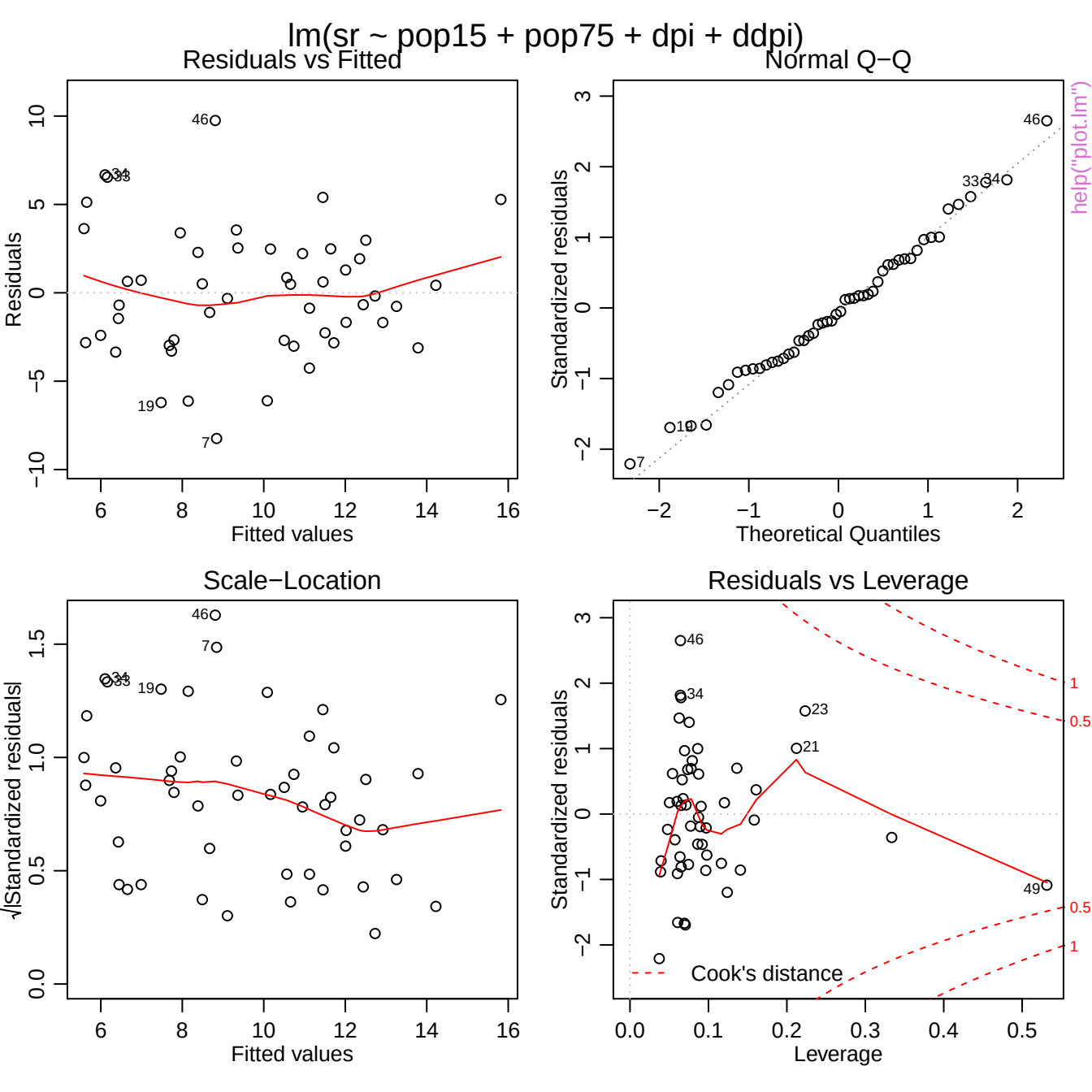

Normal Q−Q
Zambia
Philippines
Chile
Standardized residuals
Theoretical Quantiles

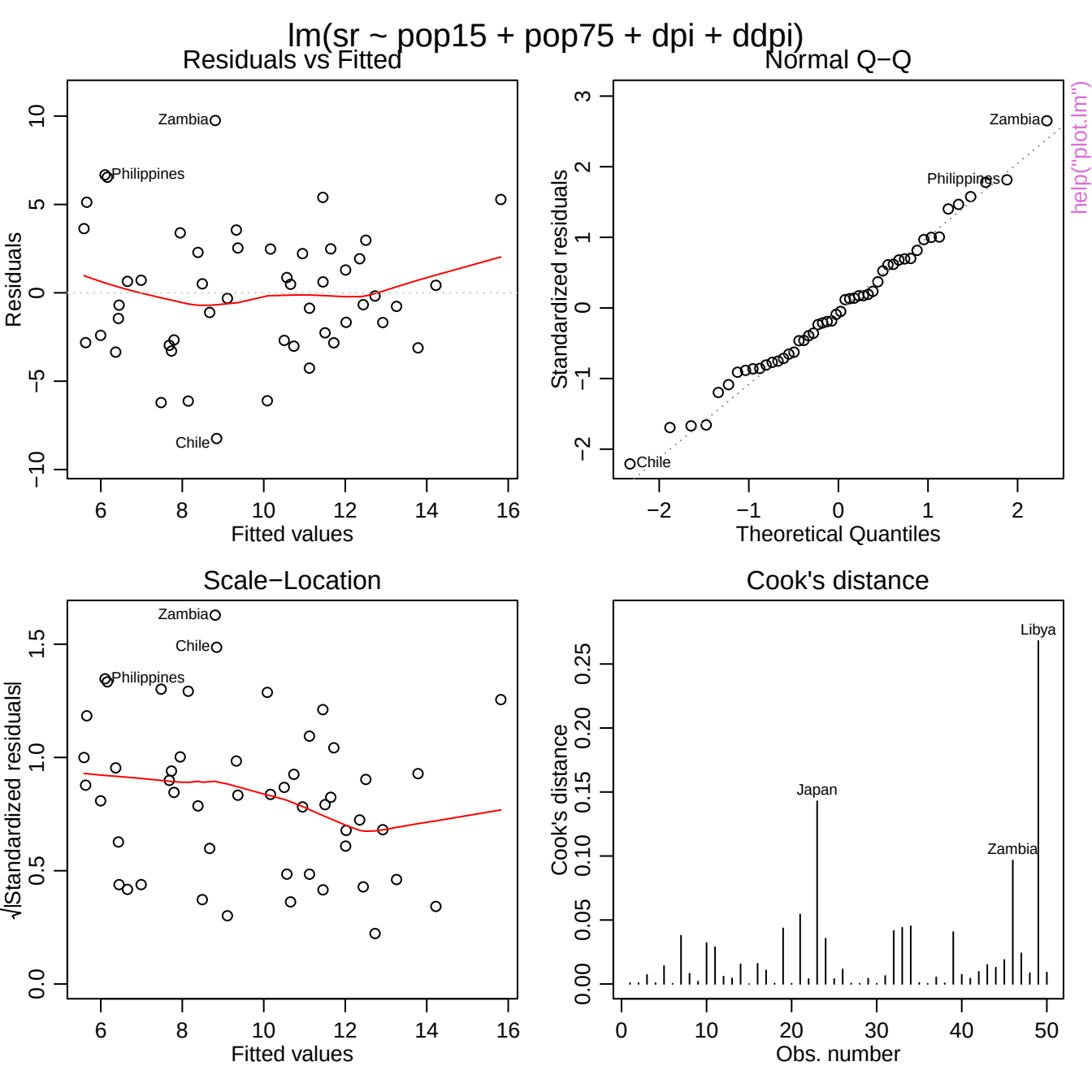

lm(sr ~ pop15 + pop75 + dpi + ddpi)
Scale−Location
Zambia
Chile
Philippines
√|Standardized residuals|
Fitted values
help("plot.lm")

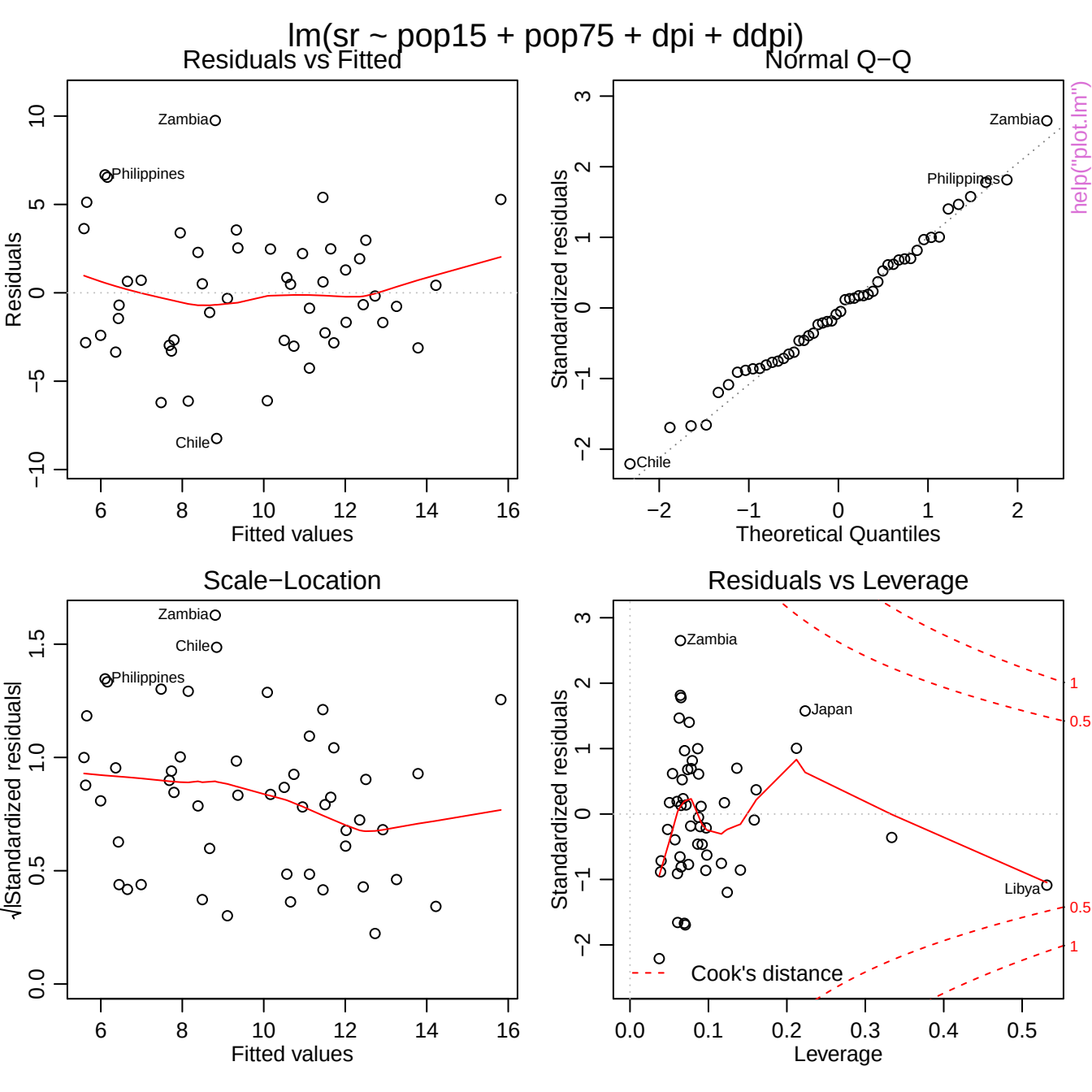

Residuals vs Leverage
Zambia
Japan
Libya
Cook's distance
Standardized residuals
Leverage

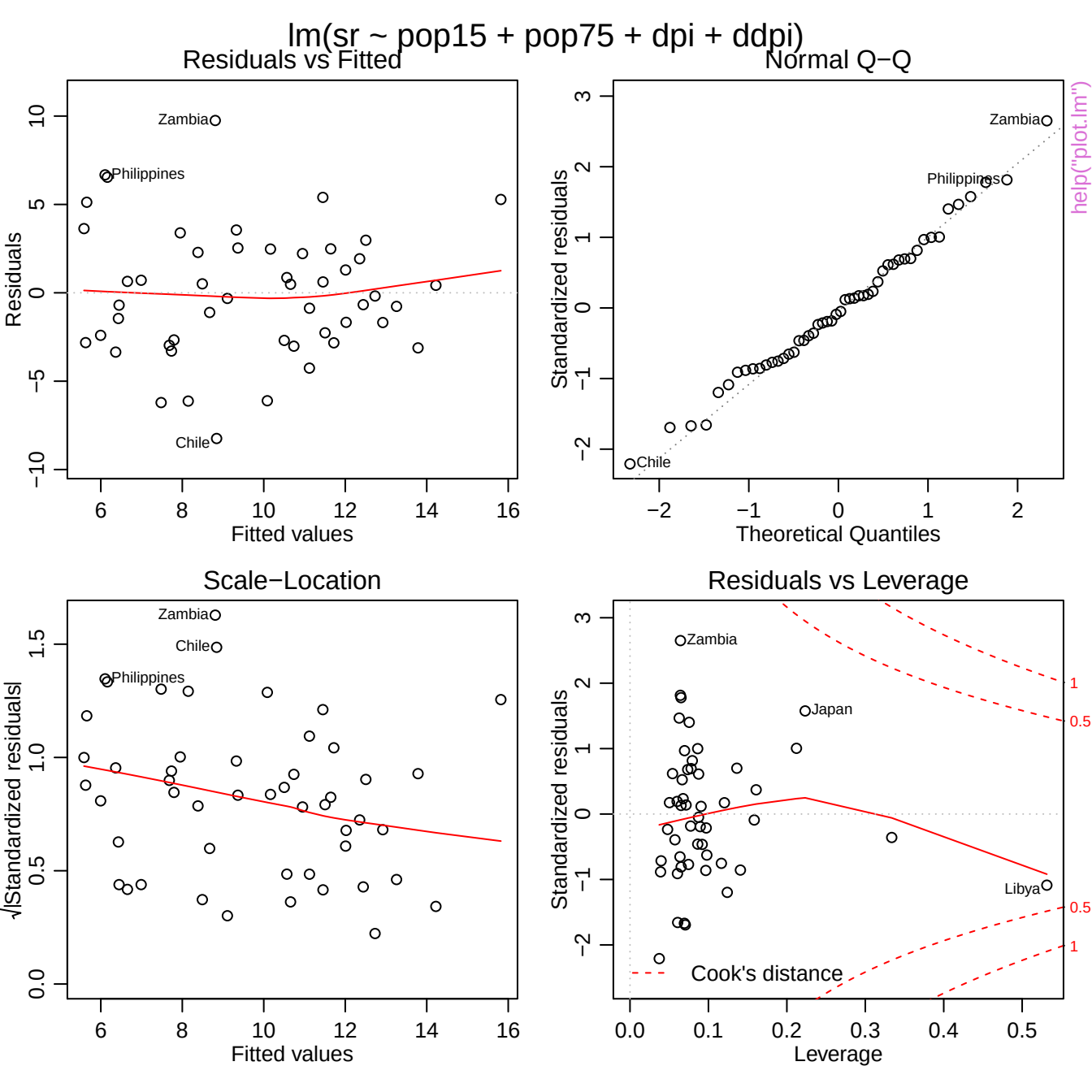

lm(sr ~ pop15 + pop75 + dpi + ddpi)
Residuals vs Fitted
Residuals
Fitted values
Zambia
Philippines
Chile
Normal Q−Q
Standardized residuals
Theoretical Quantiles
Zambia
Philippines
Chile
help("plot.lm")
Scale−Location
√|Standardized residuals|
Fitted values
Zambia
Chile
Philippines
Residuals vs Leverage
Standardized residuals
Leverage
Zambia
Japan
Libya
Cook's distance
1
0.5
0.5
1

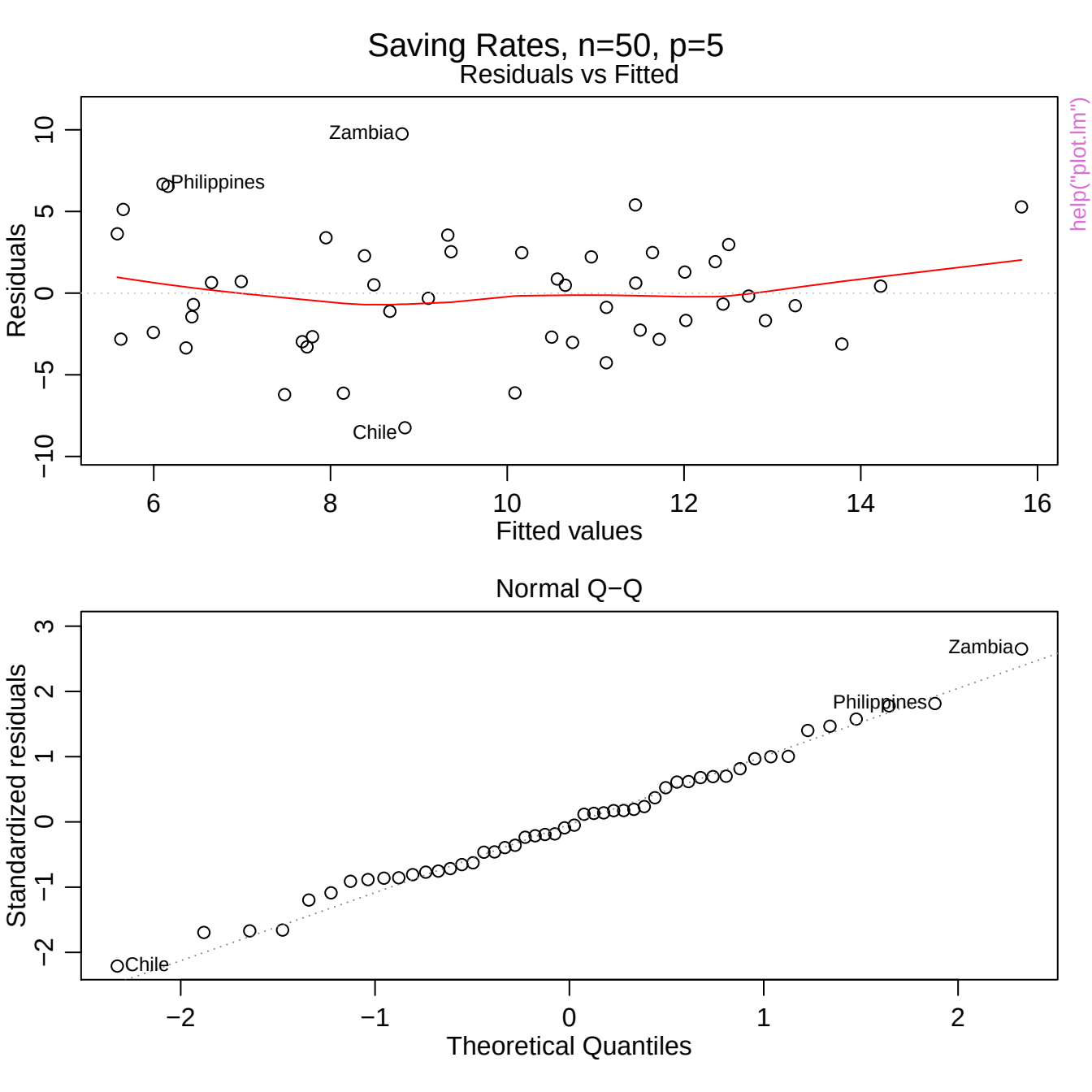

lm(sr ~ pop15 + pop75 + dpi + ddpi)
Residuals vs Fitted
Residuals
Fitted values
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("plot.lm")
Scale−Location
√|Standardized residuals|
Fitted values
Residuals vs Leverage
Standardized residuals
Leverage
Cook's distance

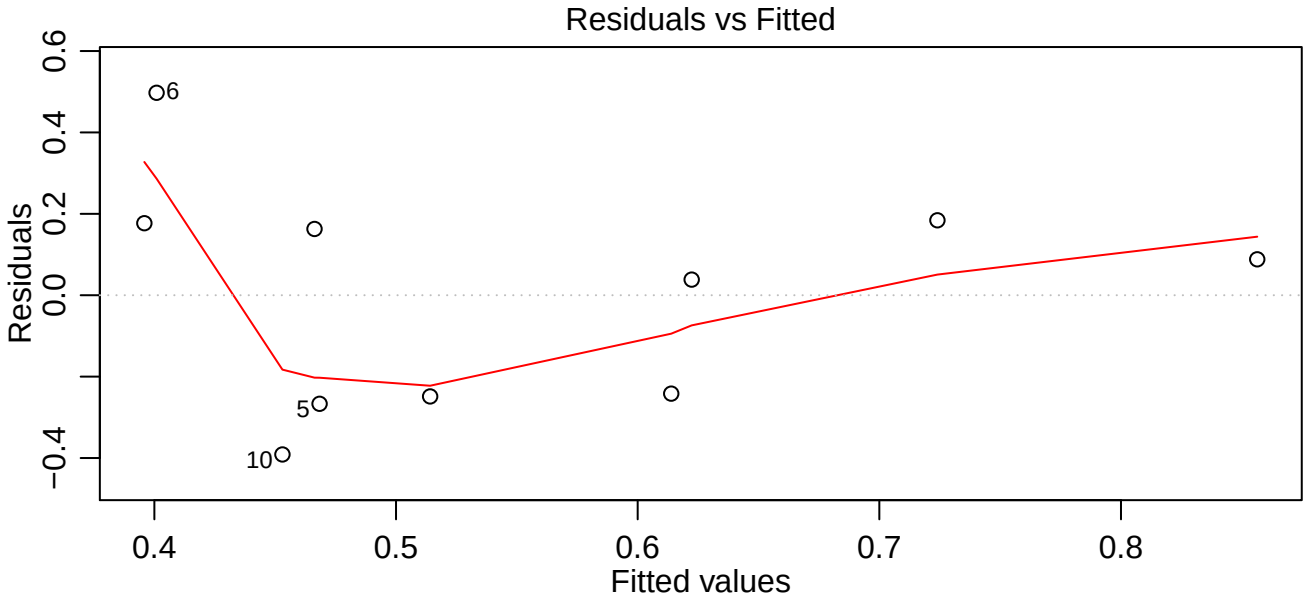

lm(sr ~ pop15 + pop75 + dpi + ddpi)
Residuals vs Fitted
Residuals
Fitted values
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("plot.lm")
Scale−Location
√|Standardized residuals|
Fitted values
Residuals vs Leverage
Standardized residuals
Leverage
Cook's distance

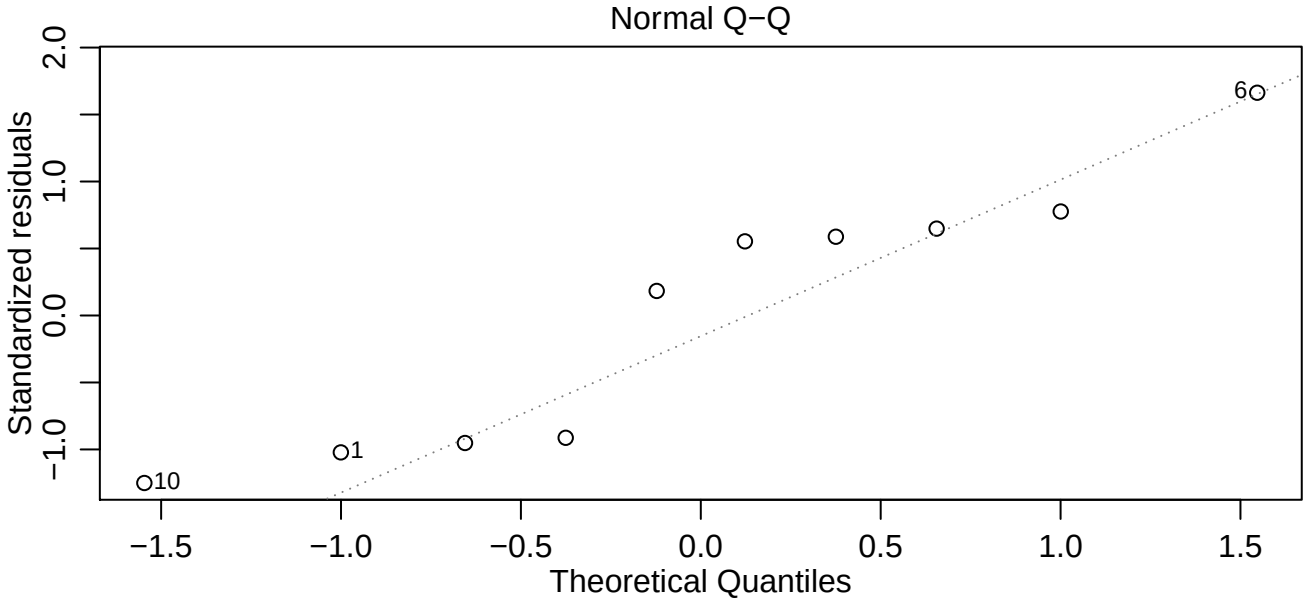

lm(sr ~ pop15 + pop75 + dpi + ddpi)
Residuals vs Fitted
Residuals
Fitted values
Zambia
Philippines
Chile
Normal Q−Q
Standardized residuals
Theoretical Quantiles
Zambia
Philippines
Chile
help("plot.lm")
Scale−Location
√|Standardized residuals|
Fitted values
Zambia
Chile
Philippines
Cook's distance
Cook's distance
Obs. number
Libya
Japan
Zambia

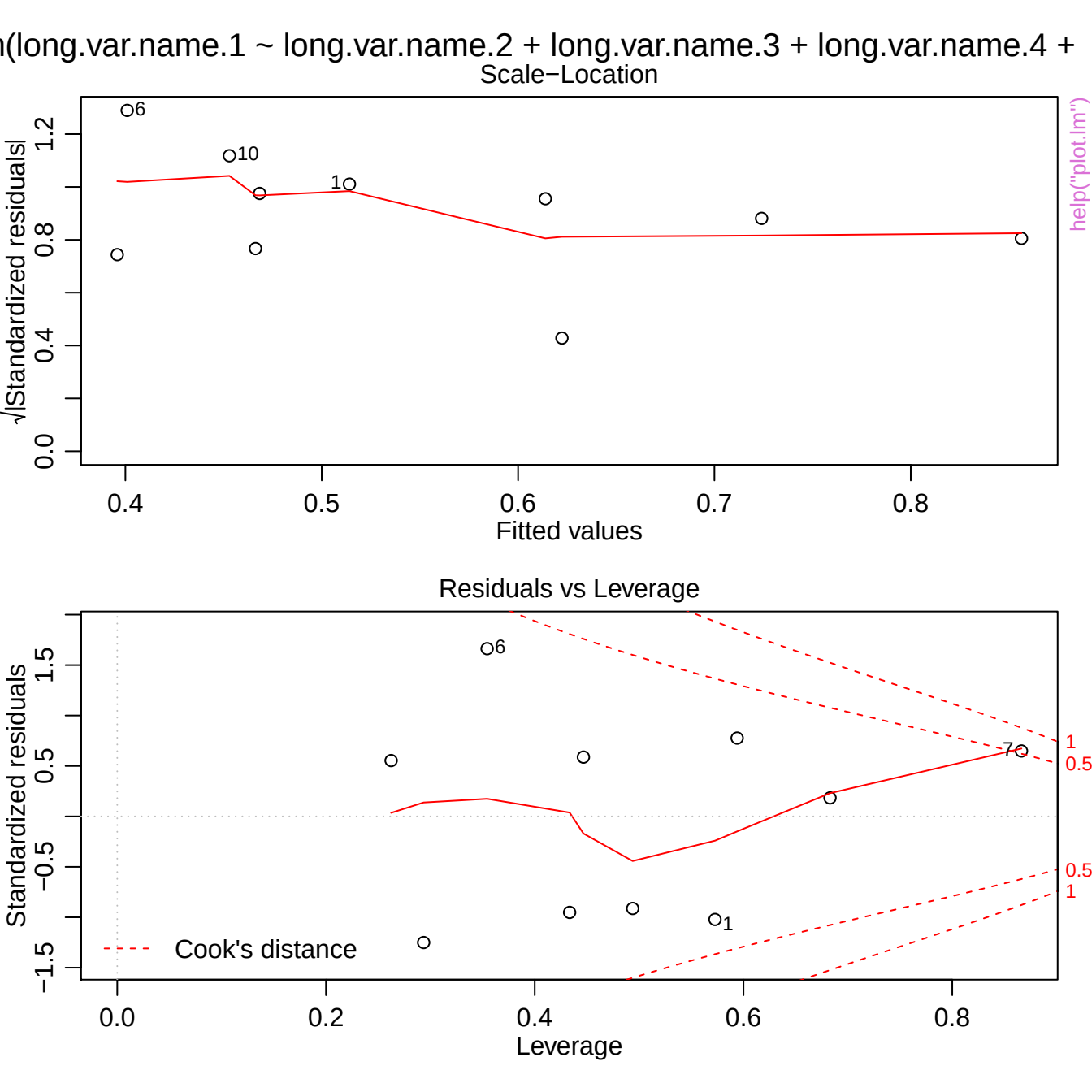

lm(sr ~ pop15 + pop75 + dpi + ddpi)
Residuals vs Fitted
Residuals
Fitted values
Zambia
Philippines
Chile
Normal Q−Q
Standardized residuals
Theoretical Quantiles
Zambia
Philippines
Chile
help("plot.lm")
Scale−Location
√|Standardized residuals|
Fitted values
Zambia
Chile
Philippines
Residuals vs Leverage
Standardized residuals
Leverage
Zambia
Japan
Libya
Cook's distance
1
0.5
0.5
1

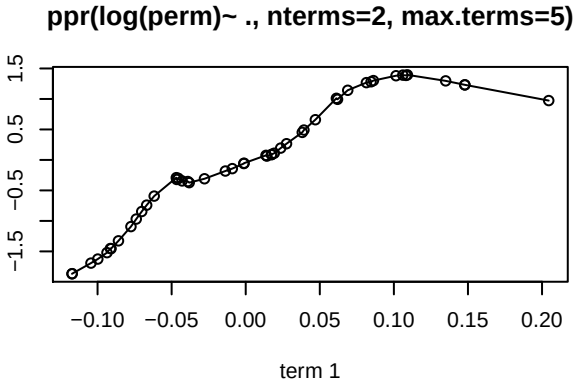

lm(sr ~ pop15 + pop75 + dpi + ddpi)
Residuals vs Fitted
Residuals
Fitted values
Zambia
Philippines
Chile
Normal Q−Q
Standardized residuals
Theoretical Quantiles
Zambia
Philippines
Chile
help("plot.lm")
Scale−Location
√|Standardized residuals|
Fitted values
Zambia
Chile
Philippines
Residuals vs Leverage
Standardized residuals
Leverage
Zambia
Japan
Libya
Cook's distance
1
0.5
0.5
1

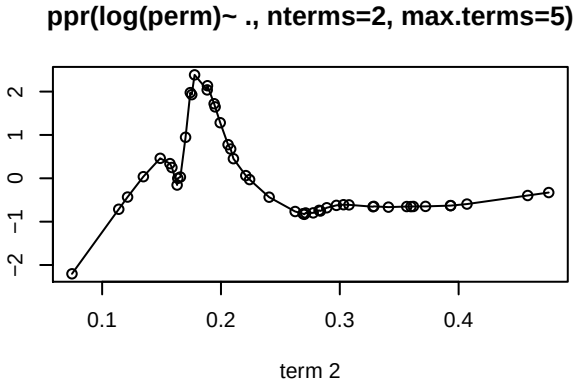

Saving Rates, n=50, p=5
Residuals vs Fitted
Zambia
Philippines
Chile
Residuals
Fitted values
help("plot.lm")
Normal Q−Q
Zambia
Philippines
Chile
Standardized residuals
Theoretical Quantiles

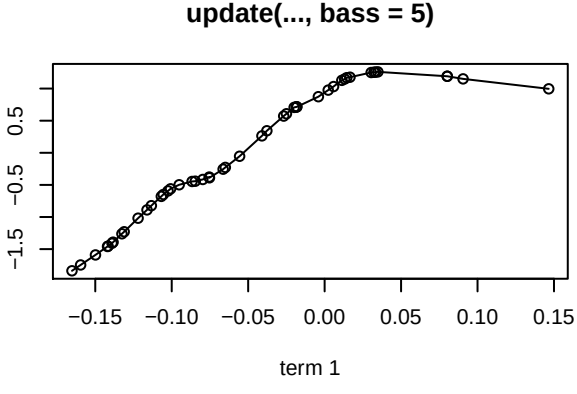

Residuals vs Fitted
Residuals
Fitted values
6
5
10
help("plot.lm")

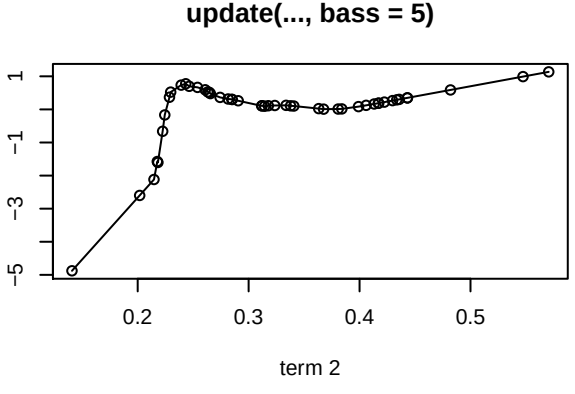

Normal Q−Q
Standardized residuals
Theoretical Quantiles
6
1
10

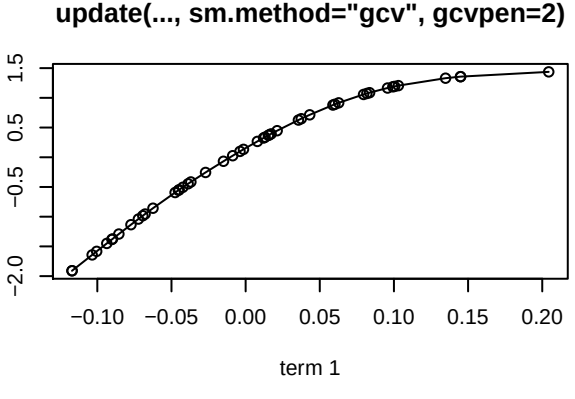

n(long.var.name.1 ~ long.var.name.2 + long.var.name.3 + long.var.name.4 +
Scale−Location
√|Standardized residuals|
Fitted values
help("plot.lm")
Residuals vs Leverage
Standardized residuals
Leverage
Cook's distance

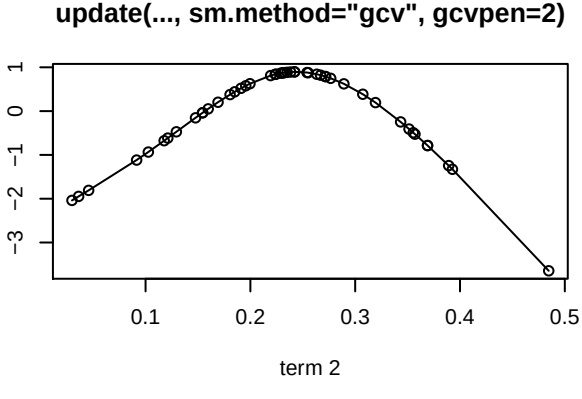




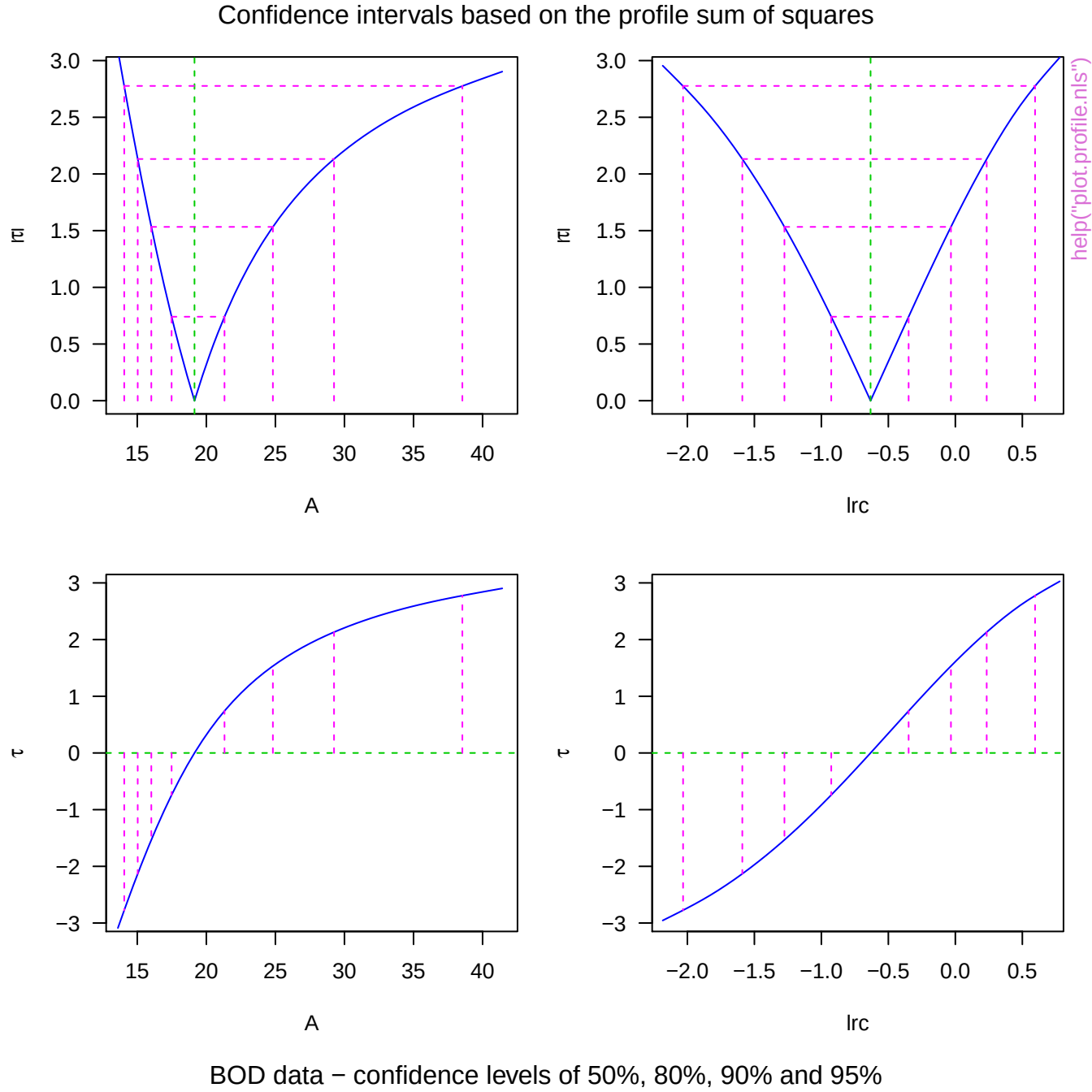


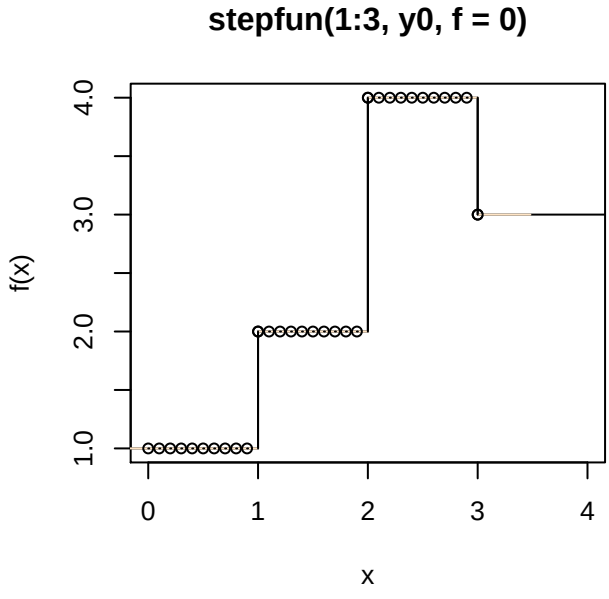


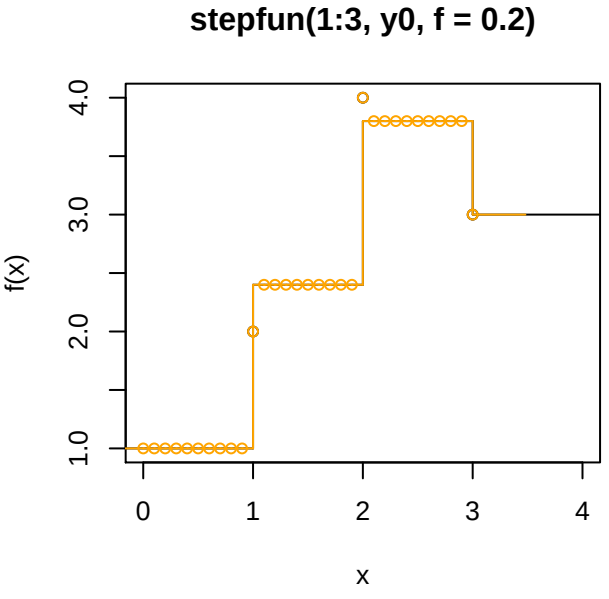




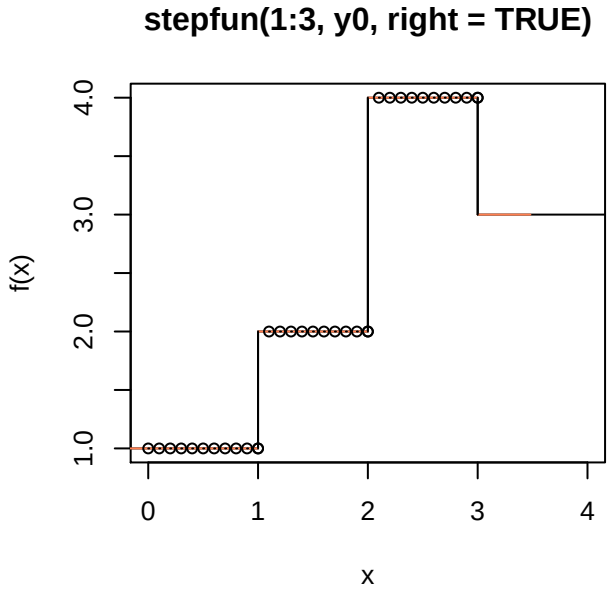
help("plot.ppr")

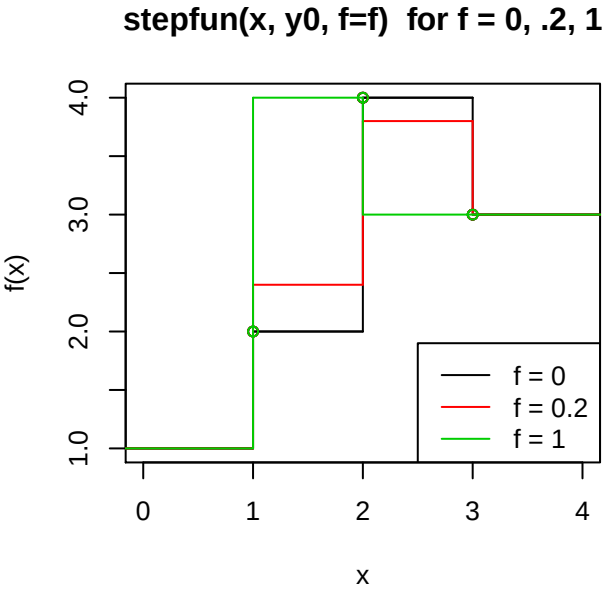

Confidence intervals based on the profile sum of squares
help("plot.profile.nls")
τ
A
lrc
BOD data − confidence levels of 50%, 80%, 90% and 95%

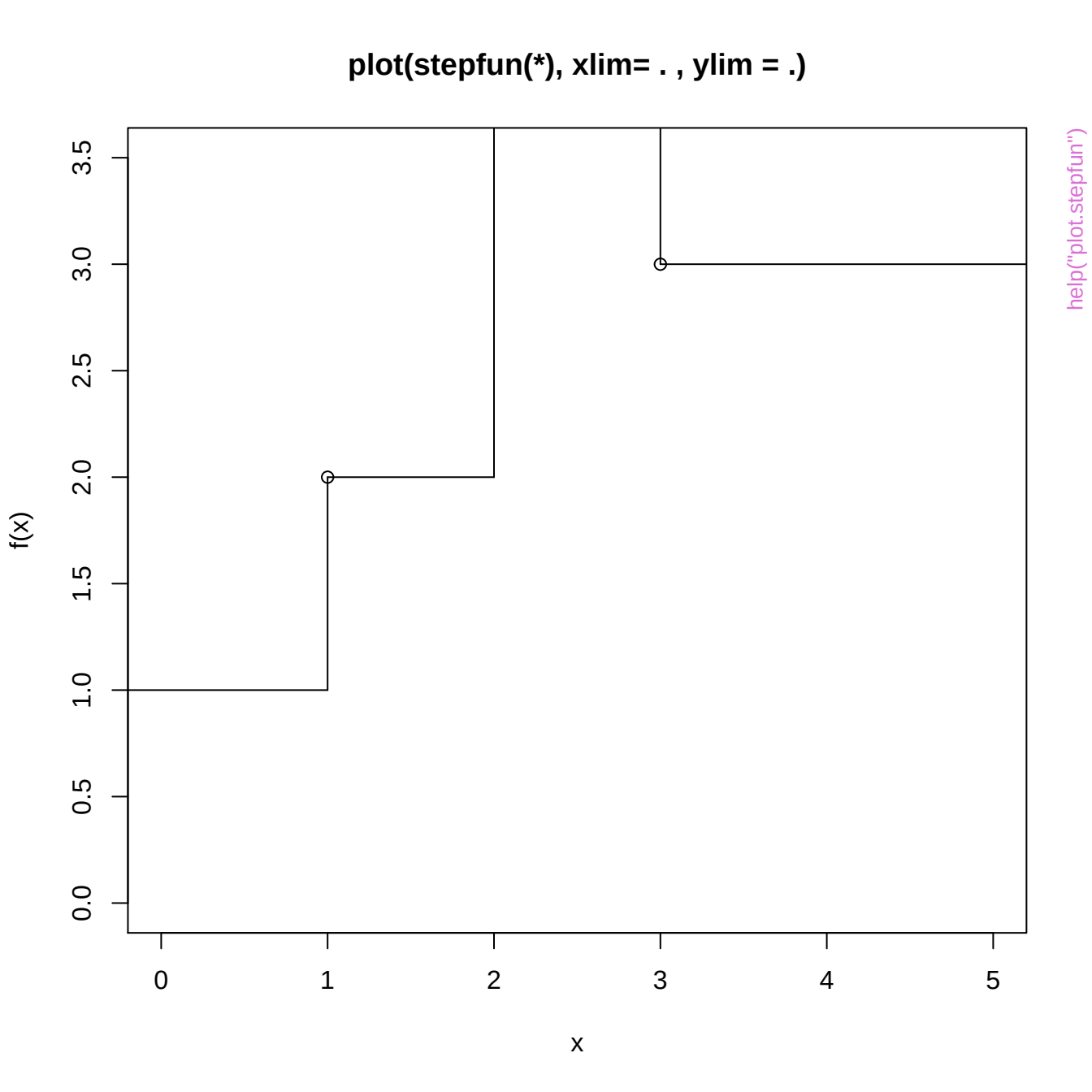


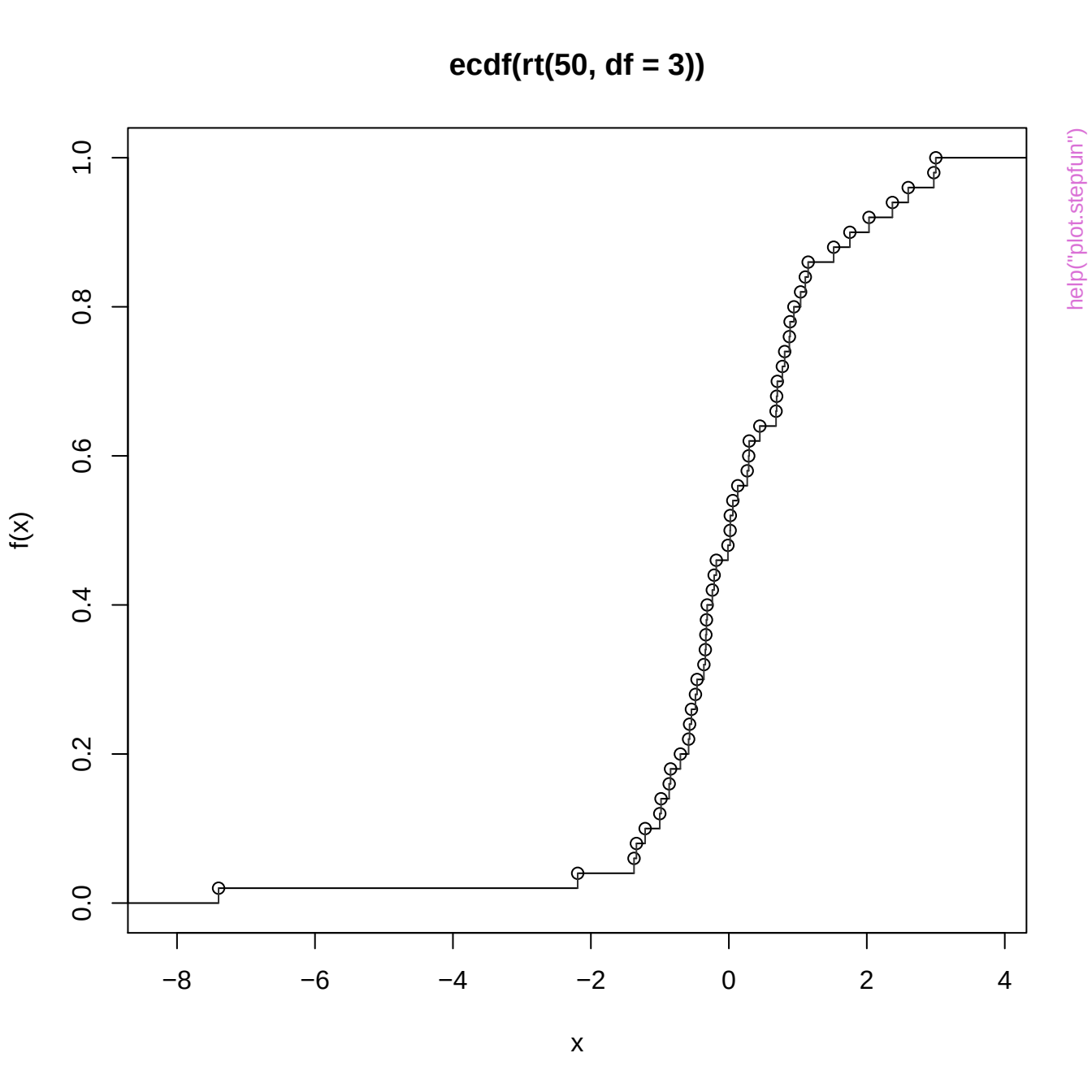


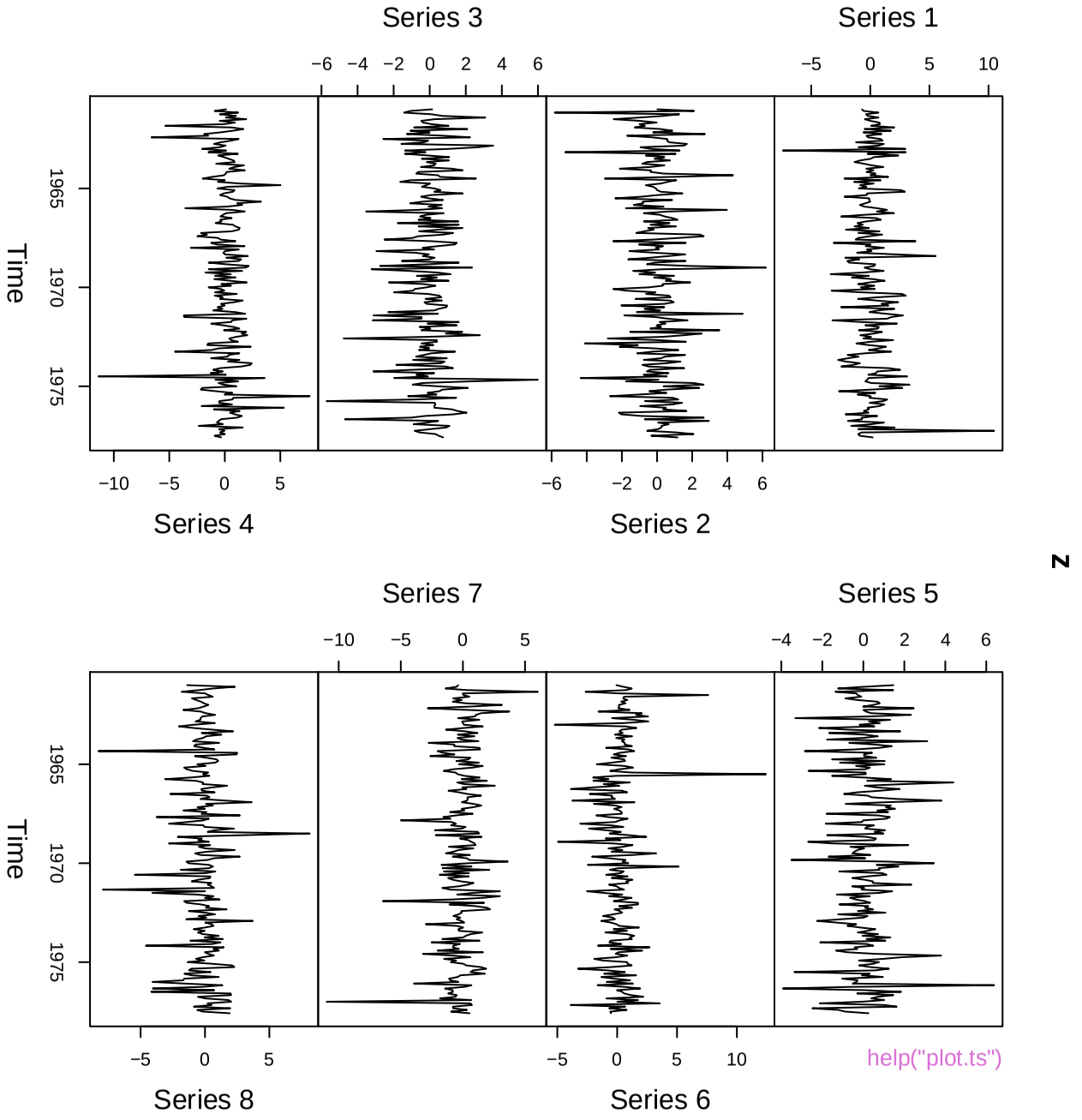
help("plot.stepfun")



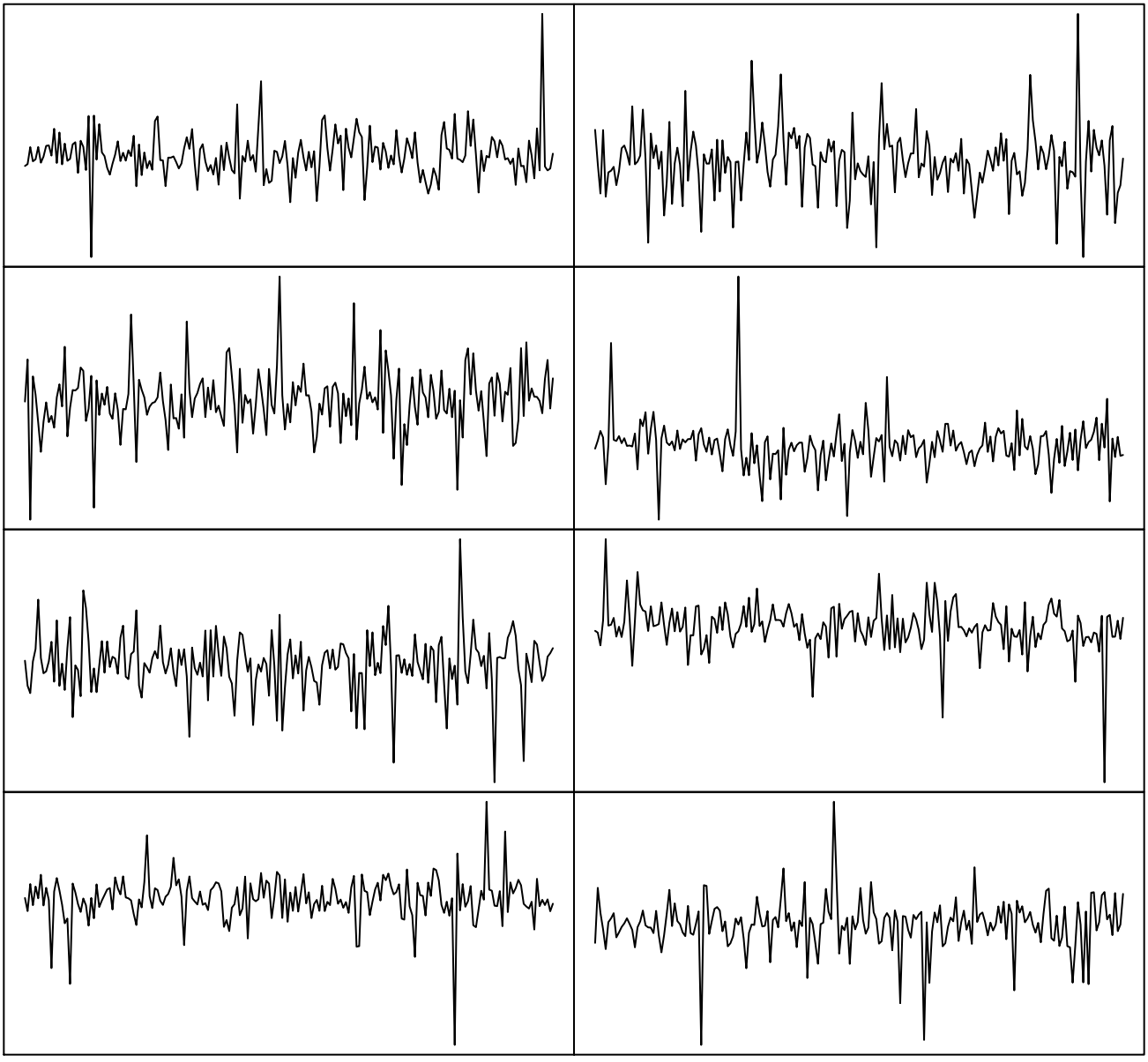


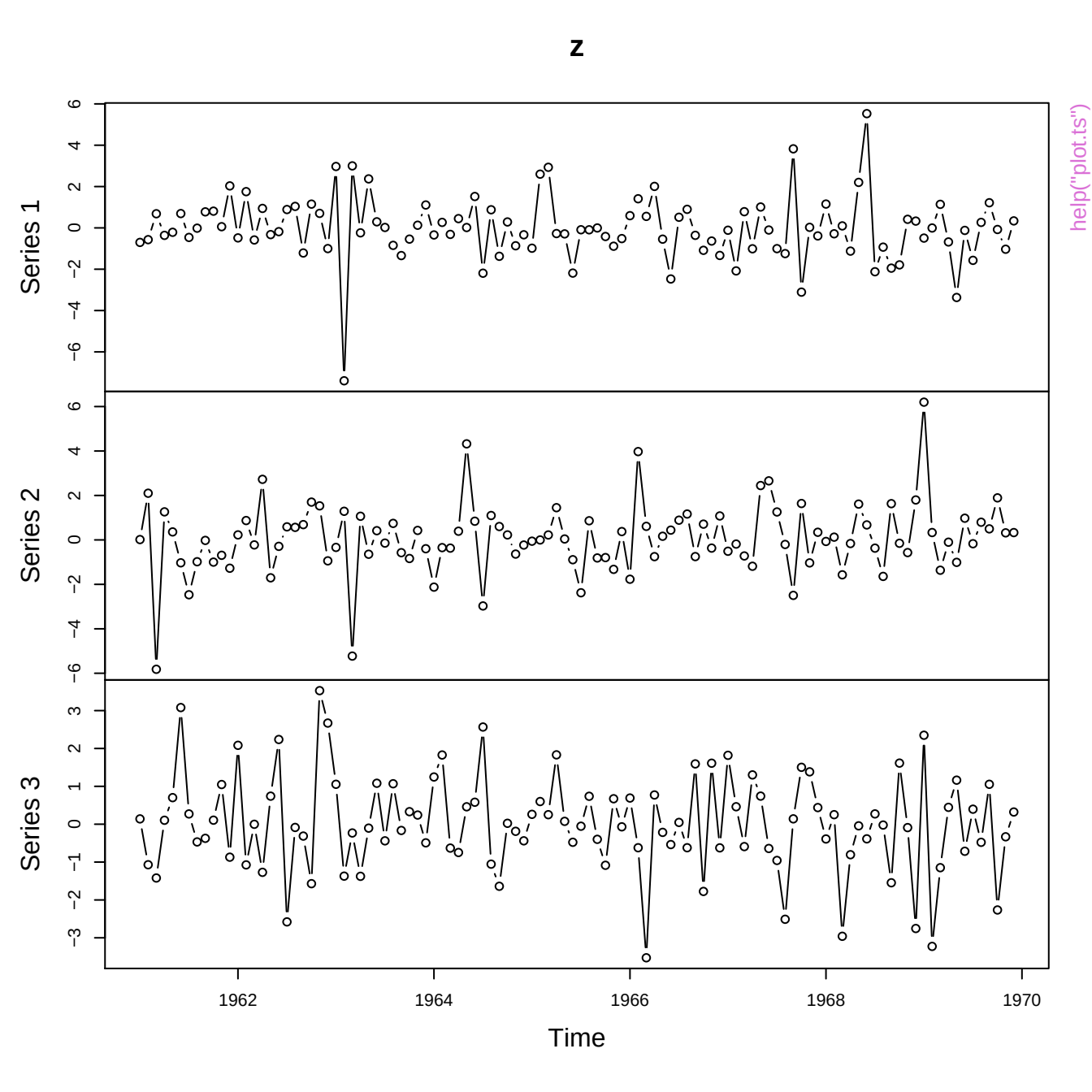

plot(stepfun(*), xlim= . , ylim = .)
f(x)
x
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
0
1
2
3
4
5
help("plot.stepfun")

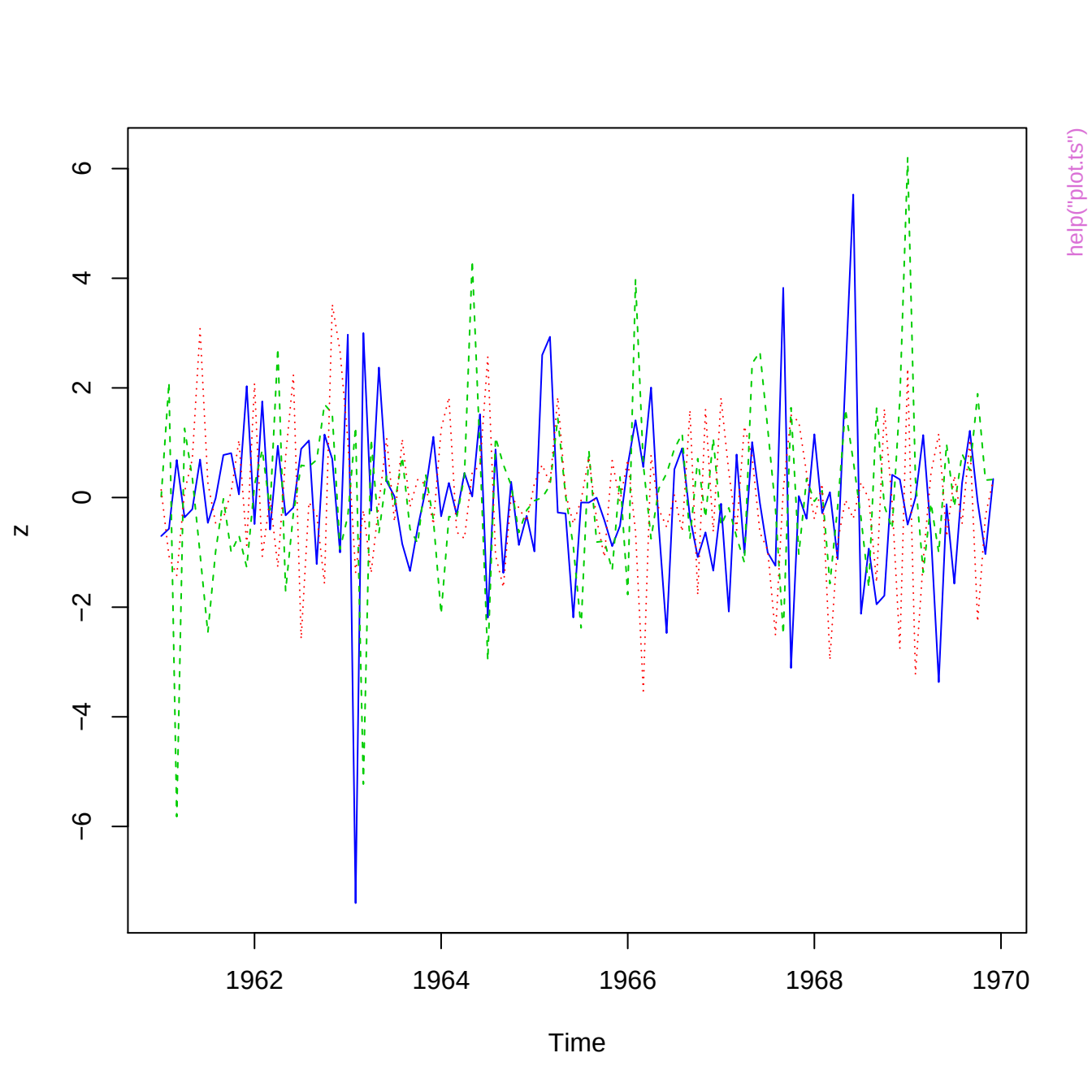

ecdf(rt(50, df = 3))
f(x)
0.0
0.2
0.4
0.6
0.8
1.0
−8
−6
−4
−2
0
2
4
x
help("plot.stepfun")

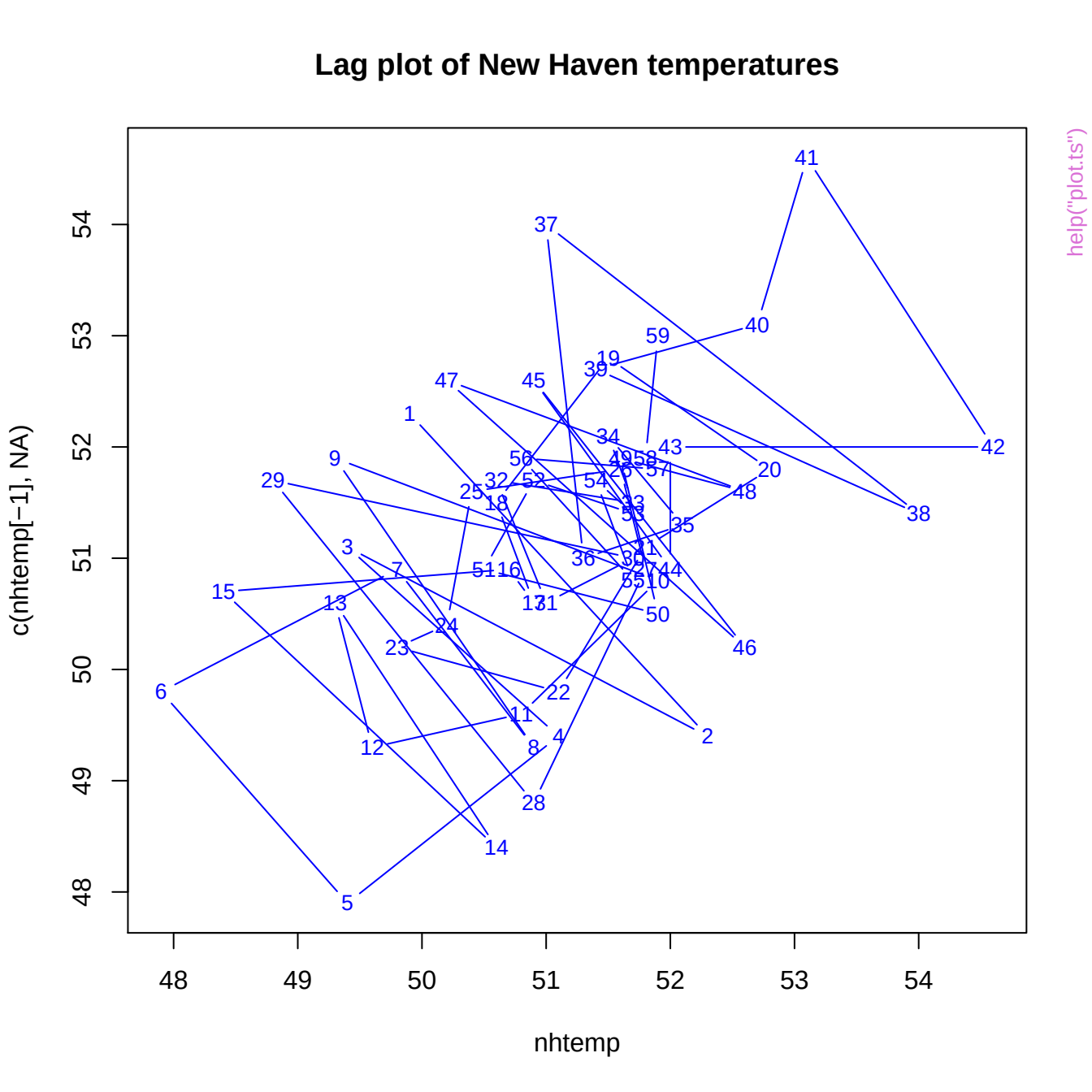

Series 3
Series 1
Series 4
Series 2
Series 7
Series 5
Series 8
Series 6
Time
1965
1970
1975
help("plot.ts")

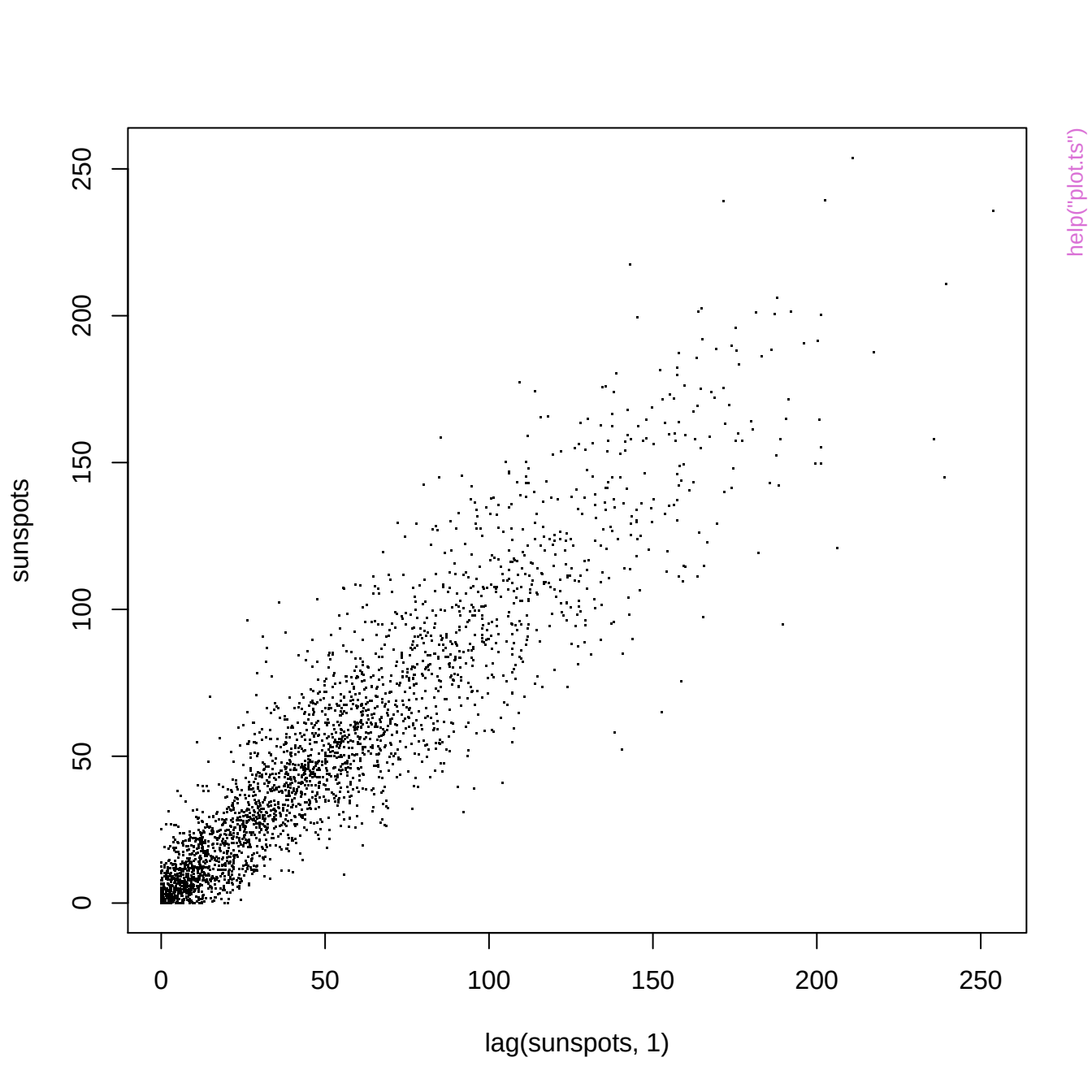
plot(ts(..), axes=FALSE, ann=FALSE, frame.plot=TRUE, mar..., oma...)

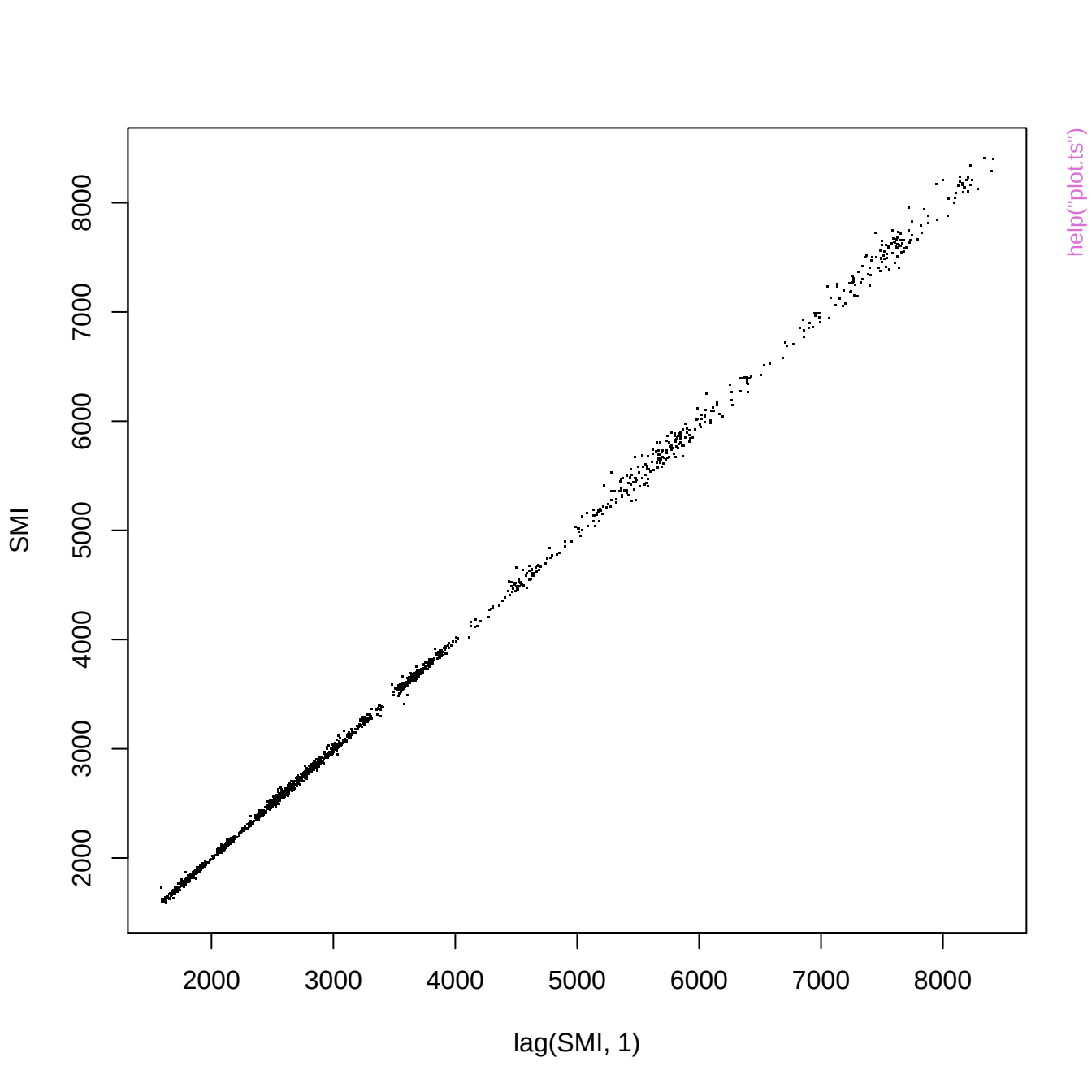


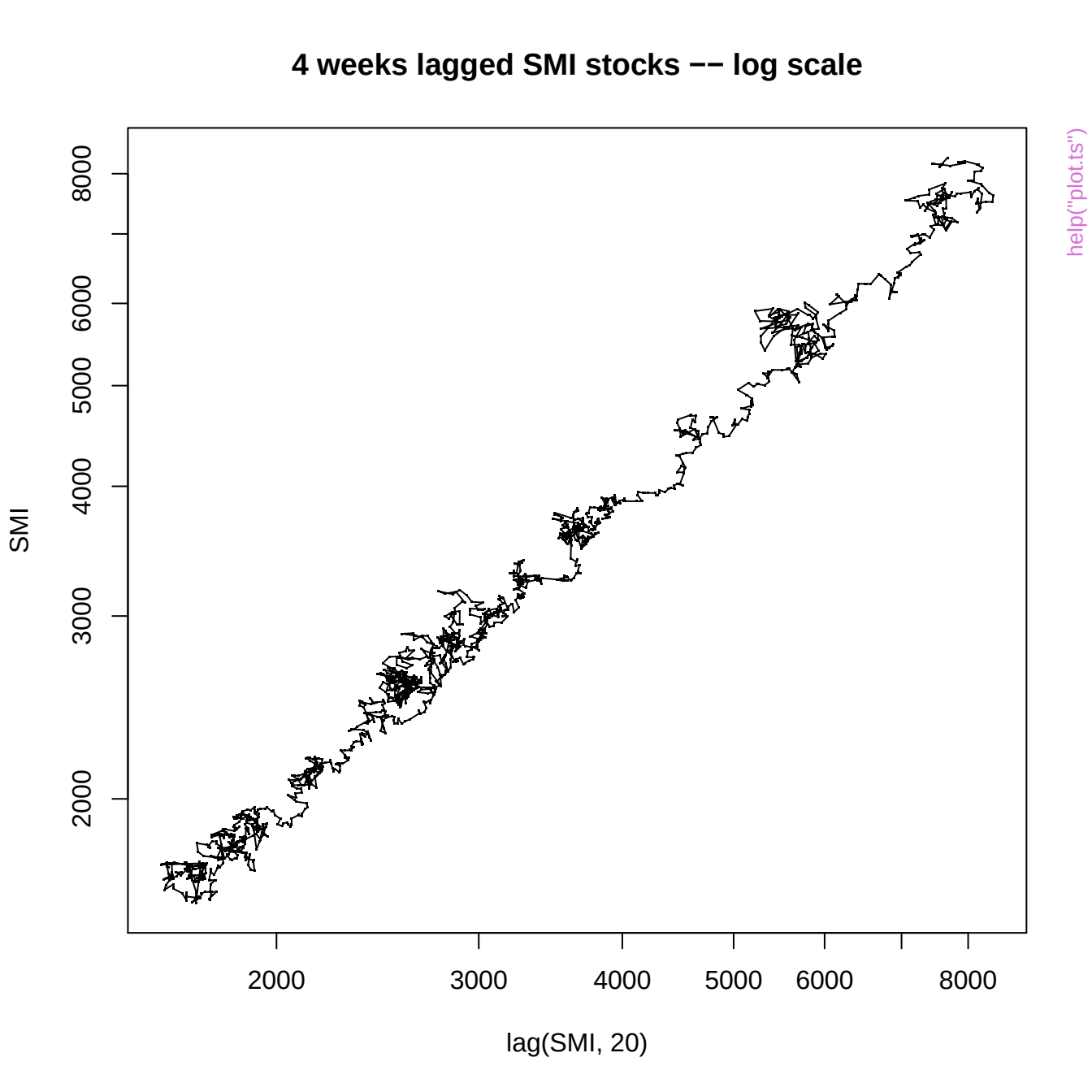

z
Series 1
Series 2
Series 3
Time
1962
1964
1966
1968
1970
help("plot.ts")

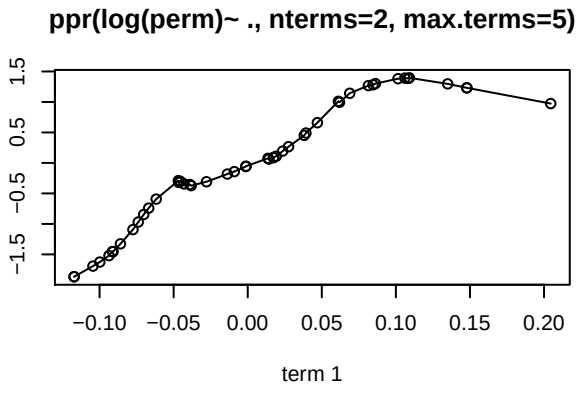

z
6
4
2
0
−2
−4
−6
1962
1964
1966
1968
1970
Time
help("plot.ts")

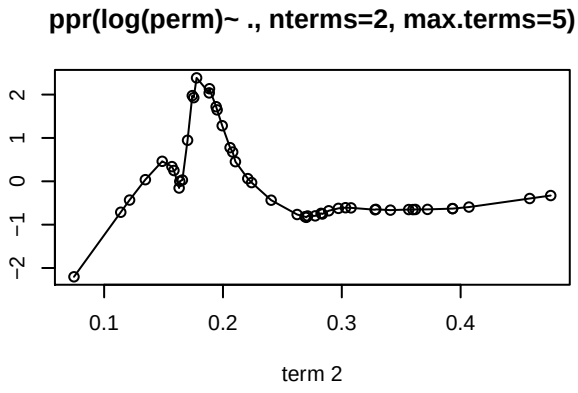

Lag plot of New Haven temperatures
c(nhtemp[−1], NA)
nhtemp
help("plot.ts")
48
49
50
51
52
53
54


sunspots
lag(sunspots, 1)
0
50
100
150
200
250
help("plot.ts")

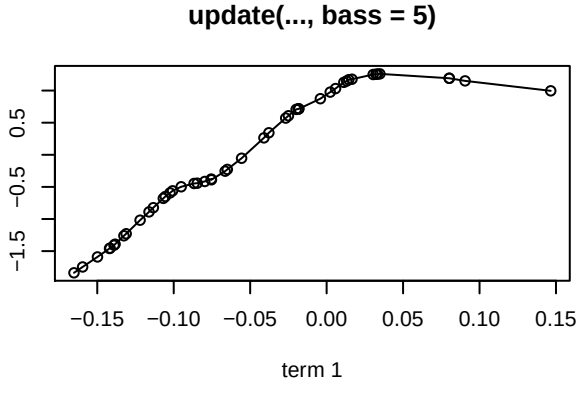

SMI
2000
3000
4000
5000
6000
7000
8000
lag(SMI, 1)
2000
3000
4000
5000
6000
7000
8000
help("plot.ts")

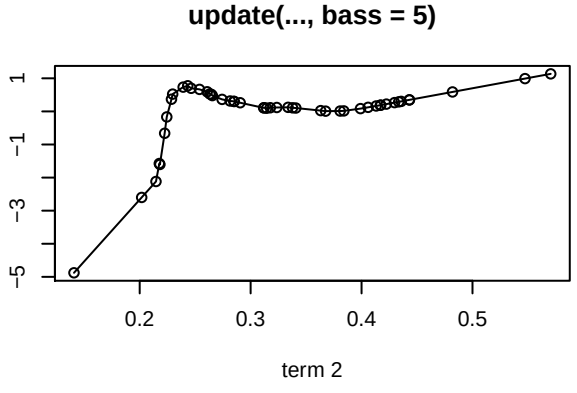

4 weeks lagged SMI stocks −− log scale
SMI
2000
3000
4000
5000
6000
8000
lag(SMI, 20)
2000
3000
4000
5000
6000
8000
help("plot.ts")

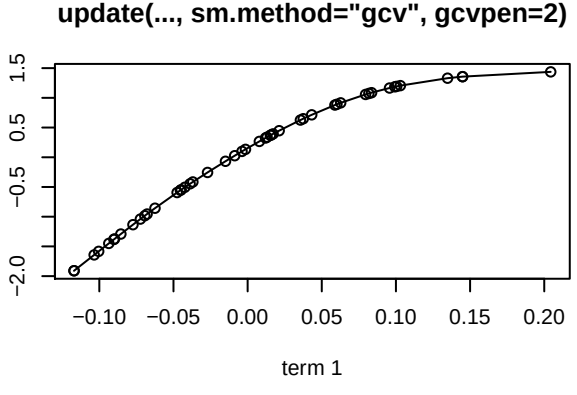

ppr(log(perm)~ ., nterms=2, max.terms=5)
term 1

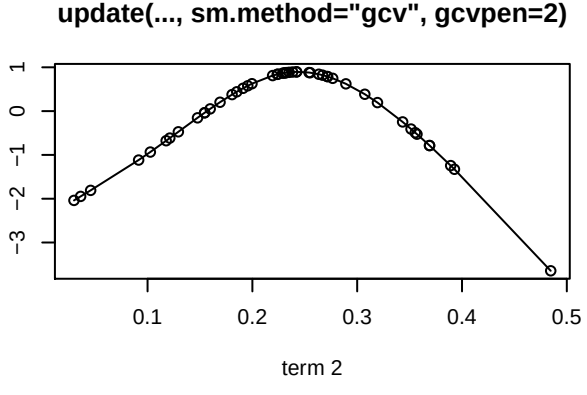

ppr(log(perm)~ ., nterms=2, max.terms=5)
term 2

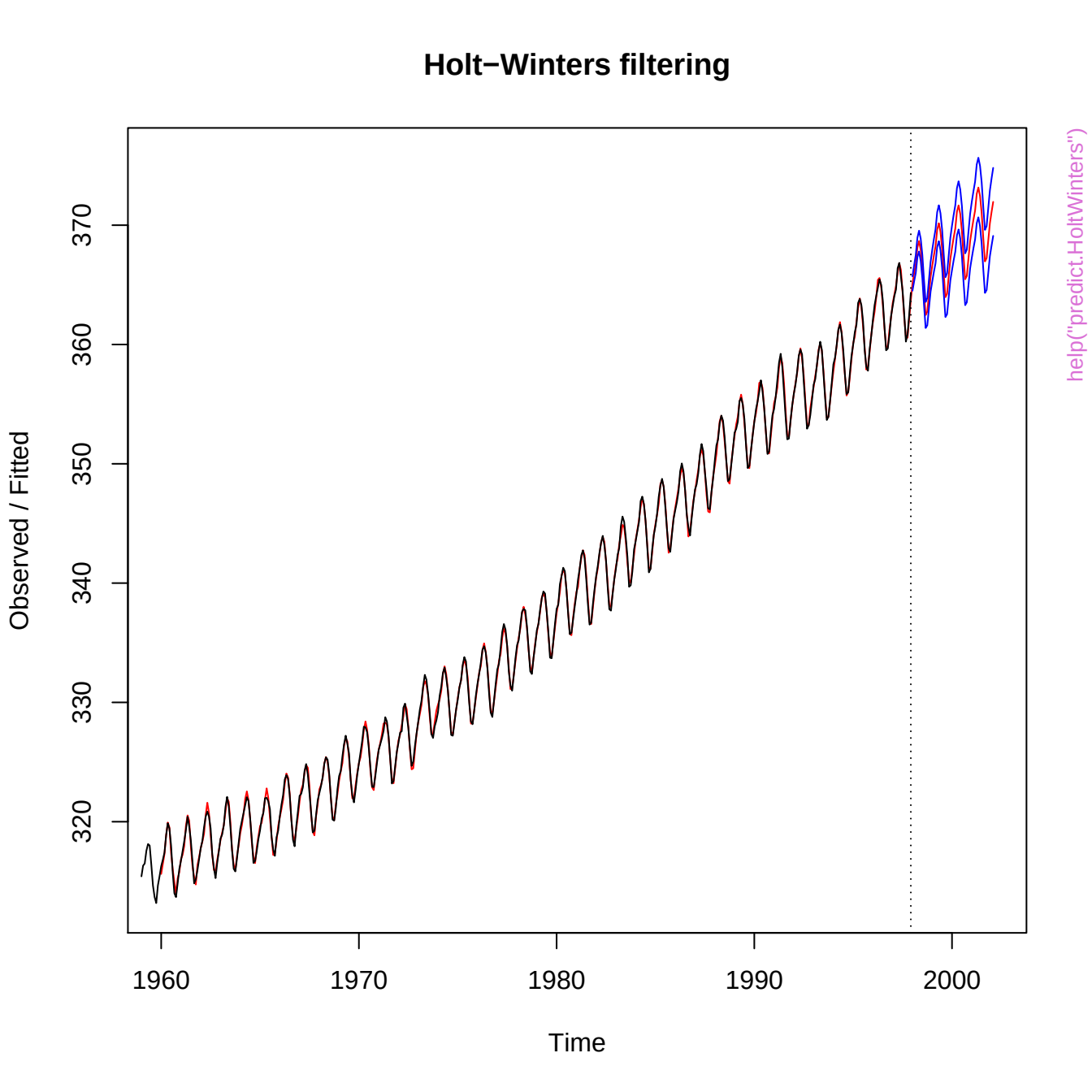
help("ppr")

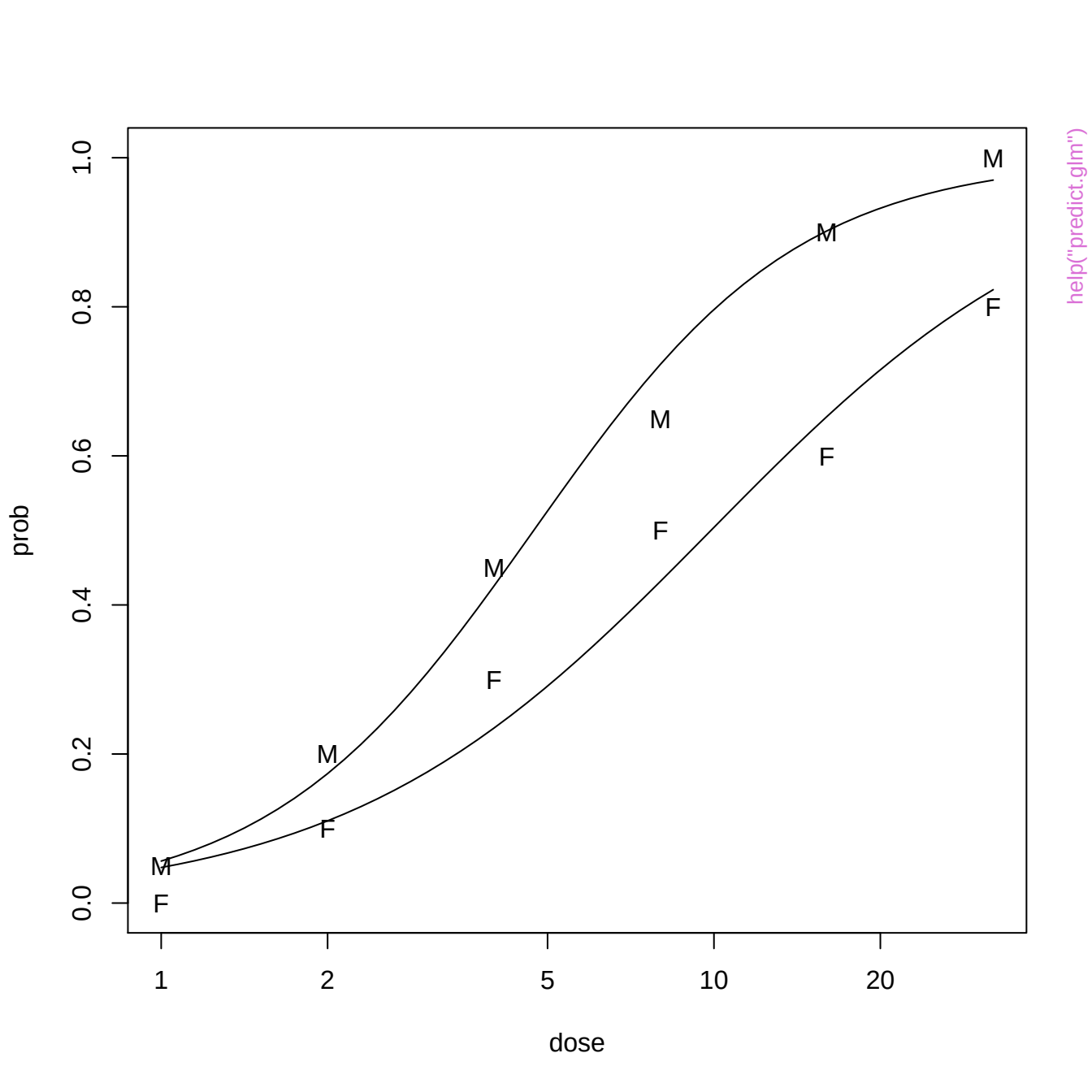

update(..., bass = 5)
term 1

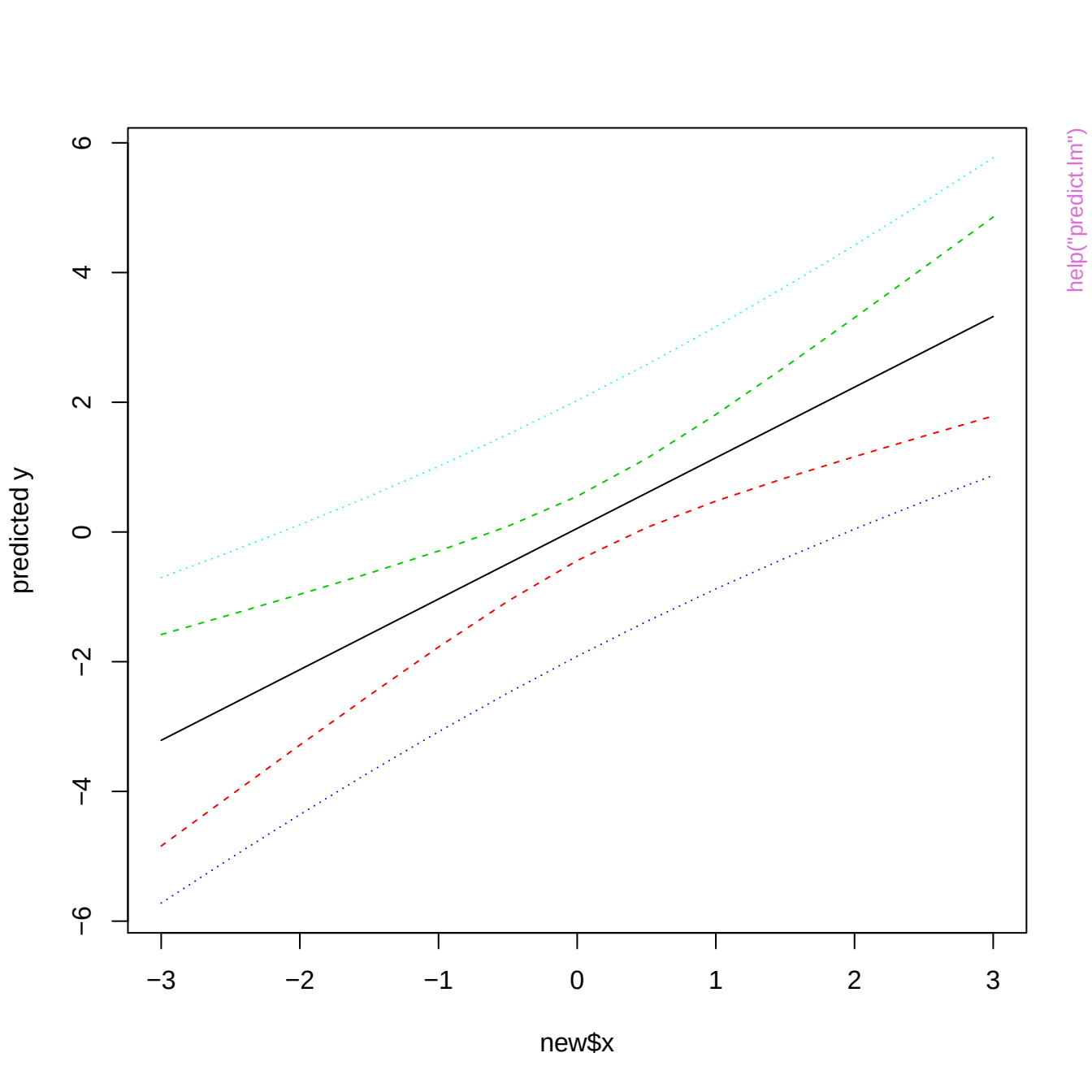

update(..., bass = 5)
term 2

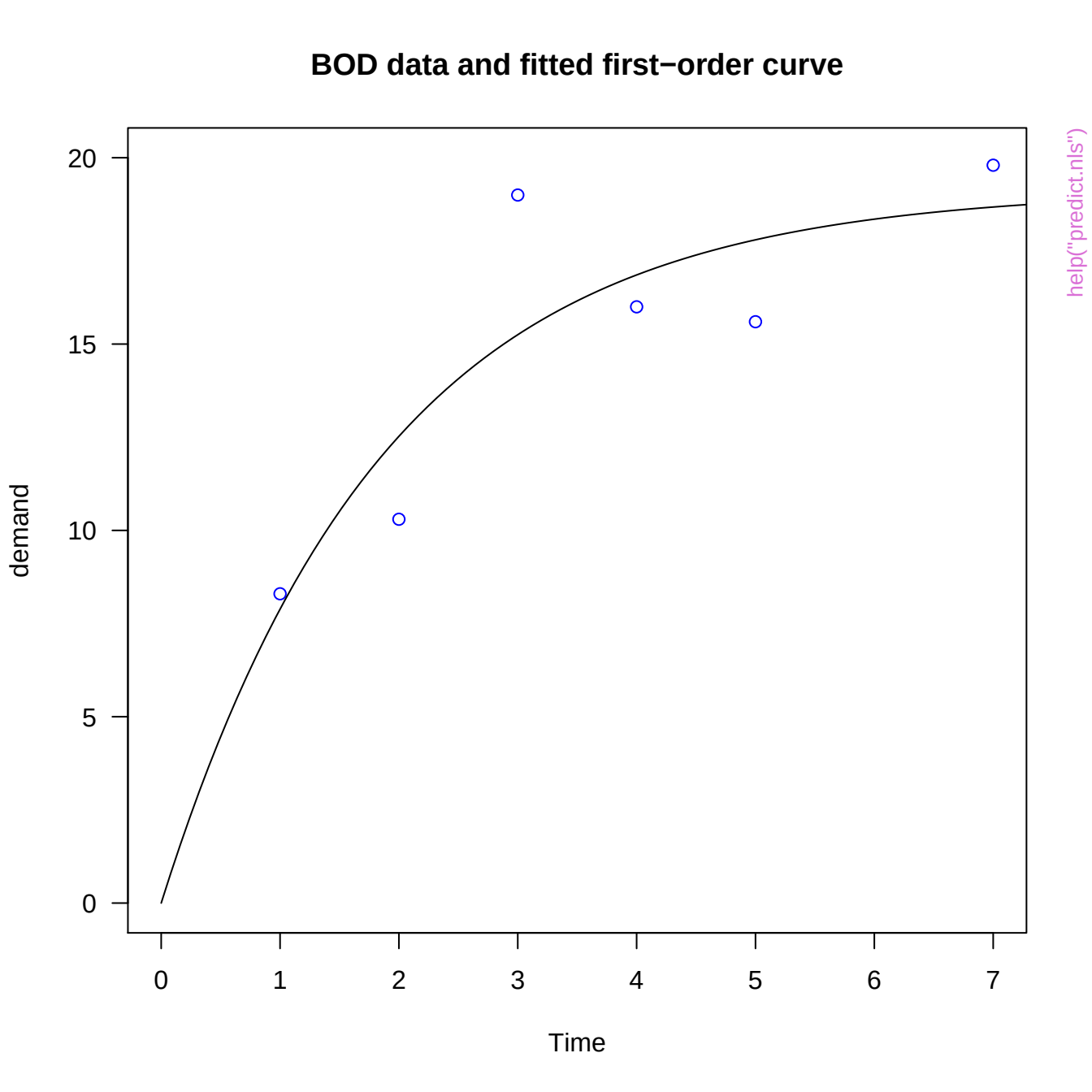

update(..., sm.method="gcv", gcvpen=2)
term 1

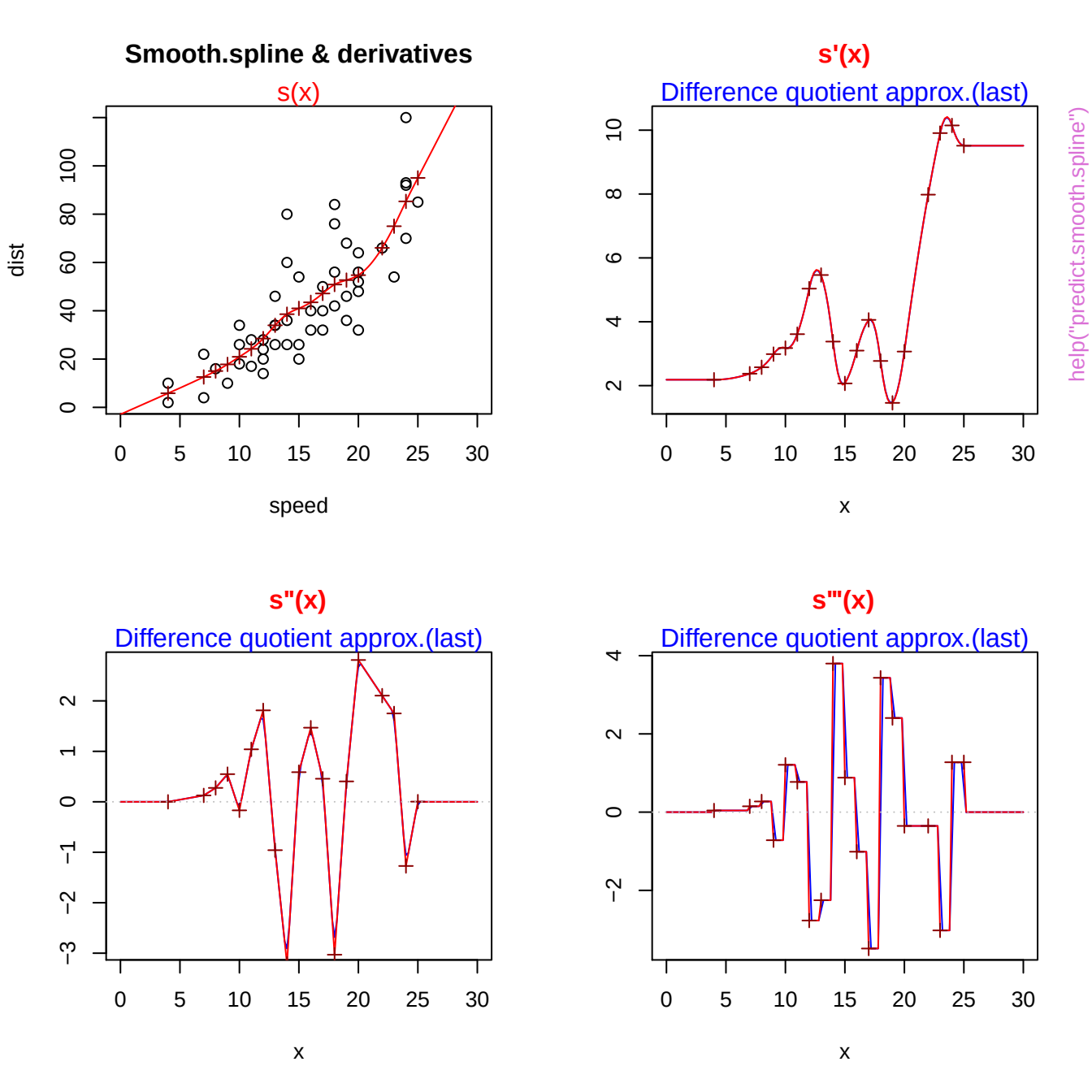

update(..., sm.method="gcv", gcvpen=2)
term 2

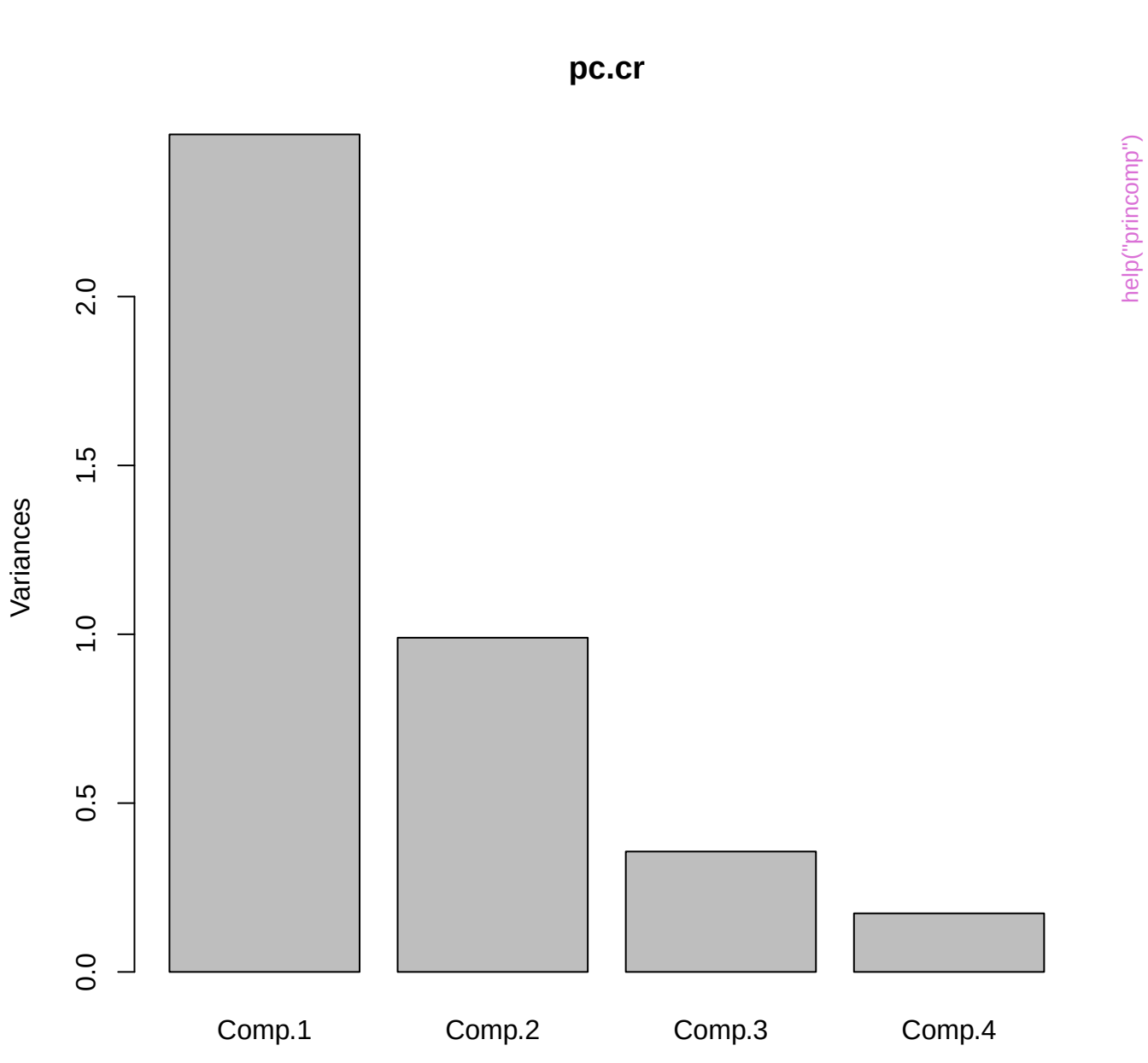

Holt−Winters filtering
Observed / Fitted
320
330
340
350
360
370
1960
1970
1980
1990
2000
Time
help("predict.HoltWinters")

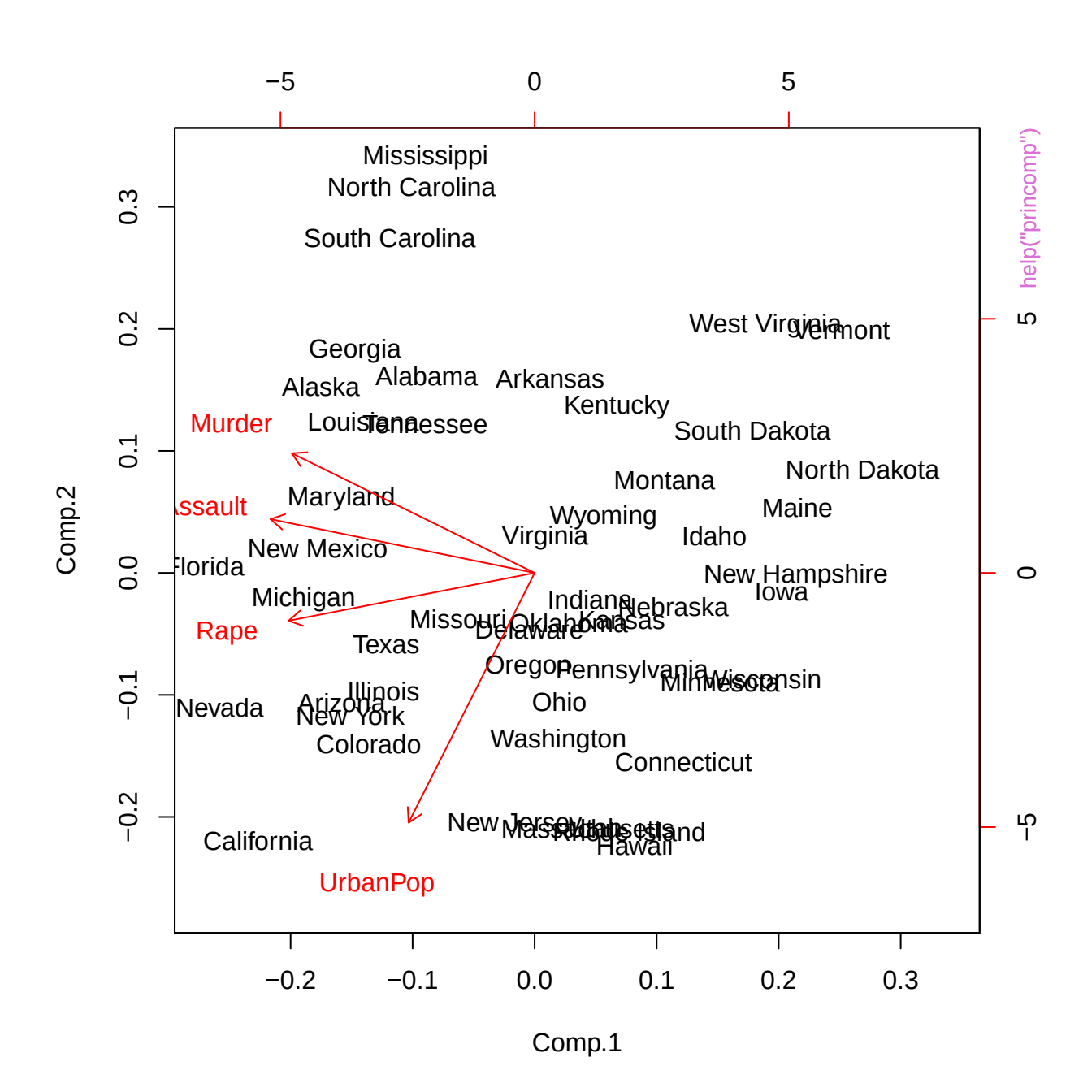

prob
0.0
0.2
0.4
0.6
0.8
1.0
dose
1
2
5
10
20
M
F
help("predict.glm")

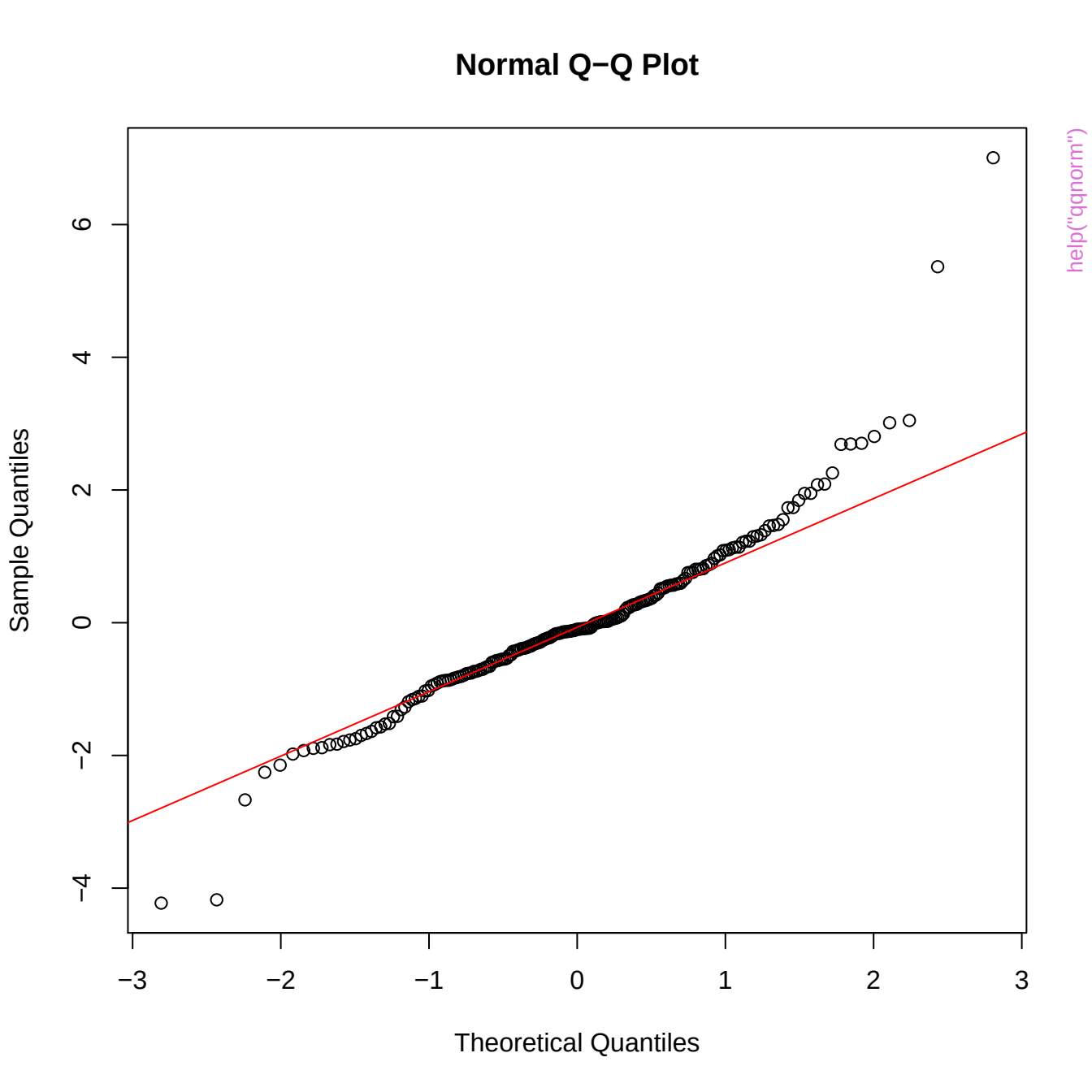

predicted y
6
4
2
0
−2
−4
−6
−3
−2
−1
0
1
2
3
new$x
help("predict.lm")

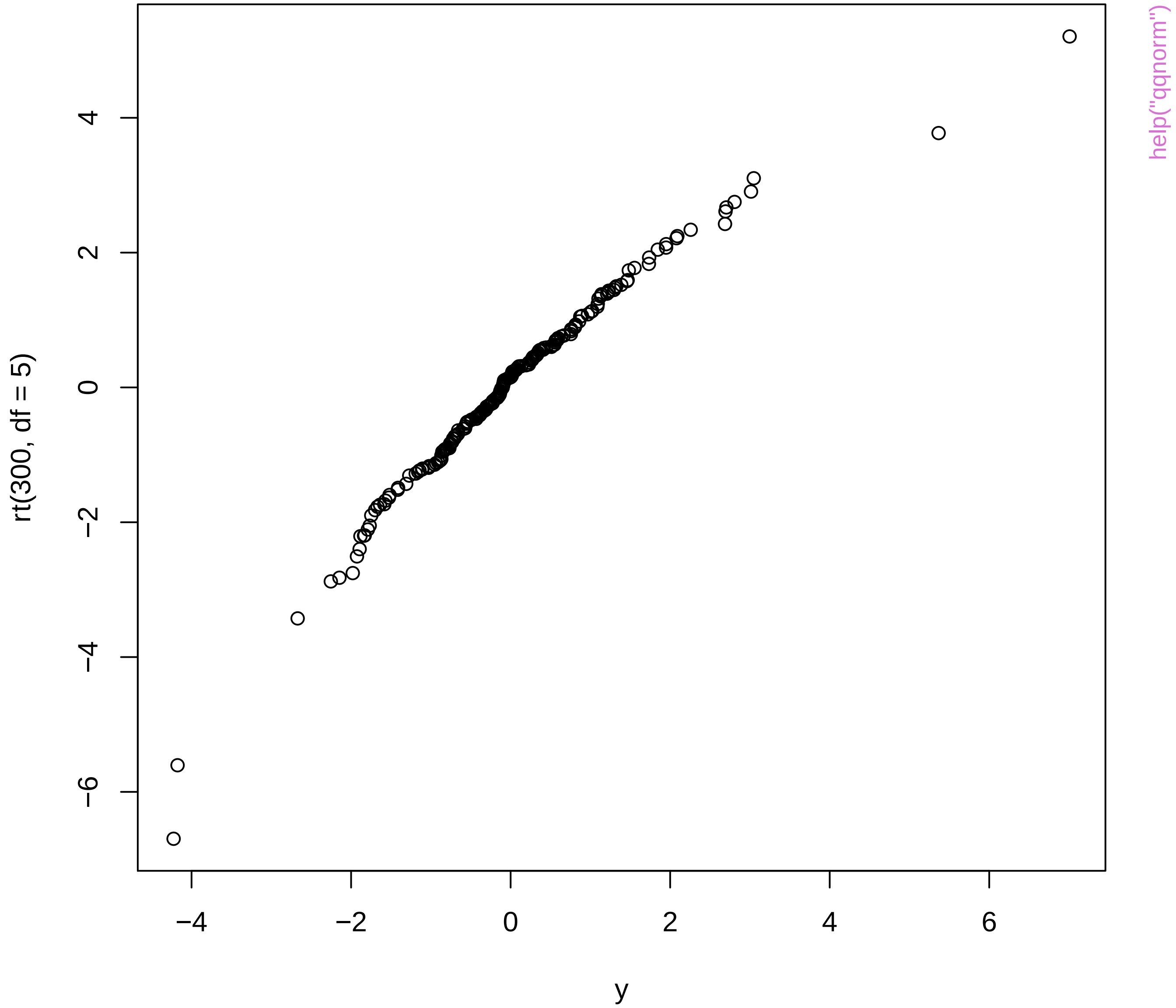

BOD data and fitted first−order curve
demand
Time
0
5
10
15
20
0
1
2
3
4
5
6
7
help("predict.nls")


Smooth.spline & derivatives
s(x)
dist
speed
s'(x)
Difference quotient approx.(last)
x
s"(x)
Difference quotient approx.(last)
x
s'"(x)
Difference quotient approx.(last)
x
help("predict.smooth.spline")

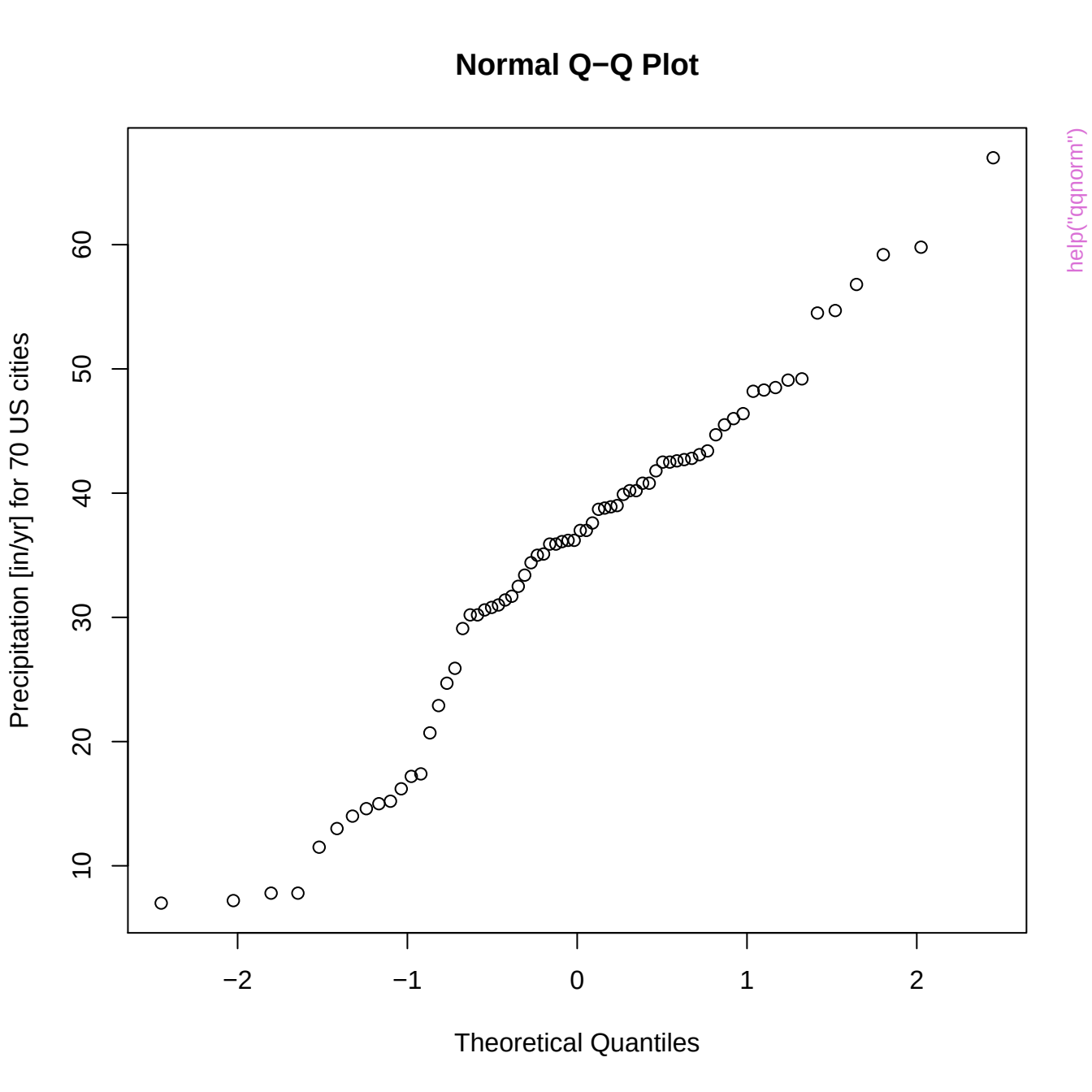

pc.cr
Variances
0.0
0.5
1.0
1.5
2.0
Comp.1
Comp.2
Comp.3
Comp.4
help("princomp")

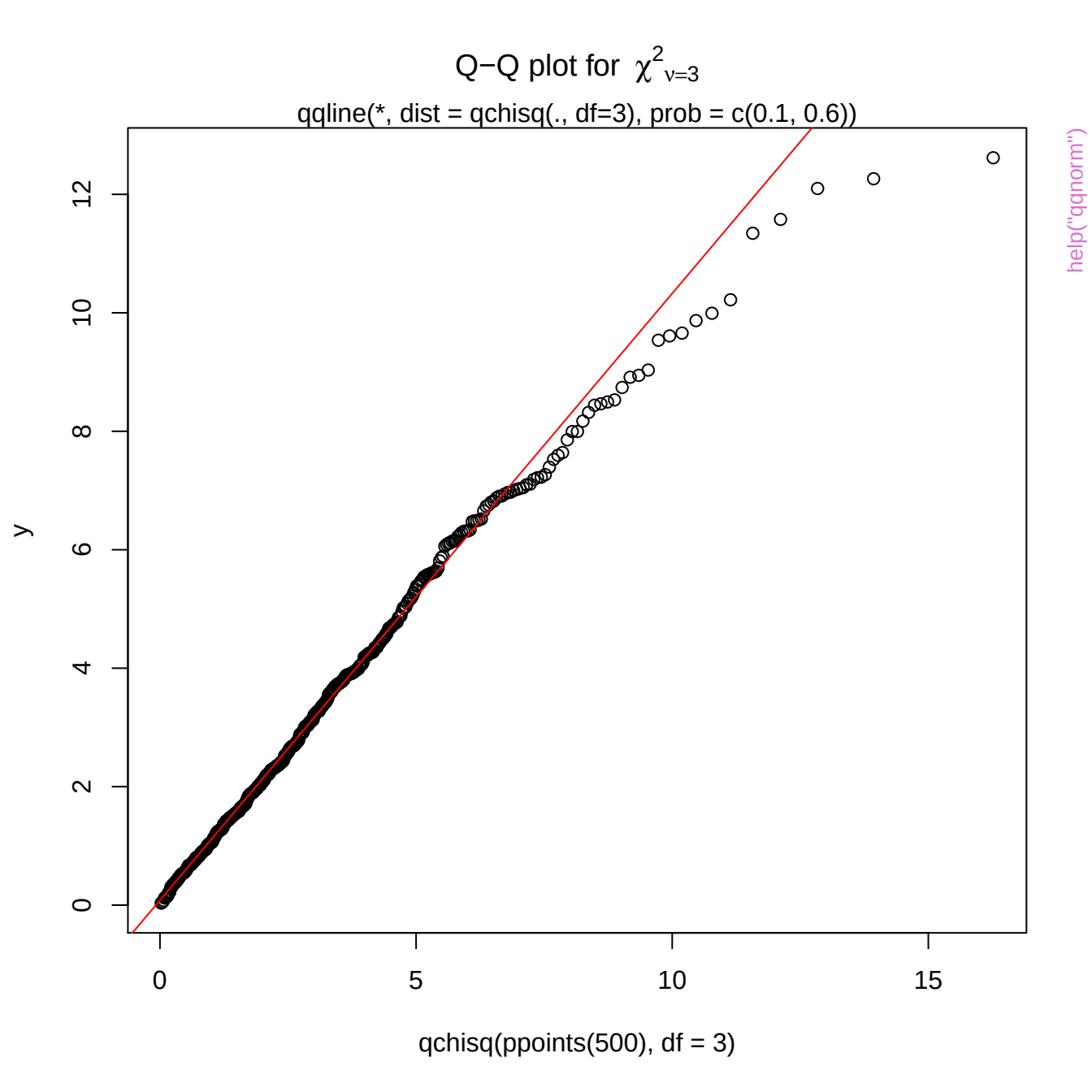

−5
0
5
Mississippi
North Carolina
South Carolina
West Virginia
Vermont
Georgia
Alabama
Arkansas
Alaska
Kentucky
Murder
Louisiana
Tennessee
South Dakota
North Dakota
Montana
Maryland
Maine
Wyoming
Virginia
Idaho
New Mexico
New Hampshire
Iowa
Michigan
Indiana
Nebraska
Missouri
Oklahoma
Kansas
Delaware
Rape
Texas
Oregon
Pennsylvania
Minnesota
Wisconsin
Illinois
Nevada
Arizona
Ohio
New York
Washington
Colorado
Connecticut
California
Hawaii
UrbanPop
0.3
0.2
0.1
0.0
−0.1
−0.2
Comp.2
Comp.1
help("princomp")

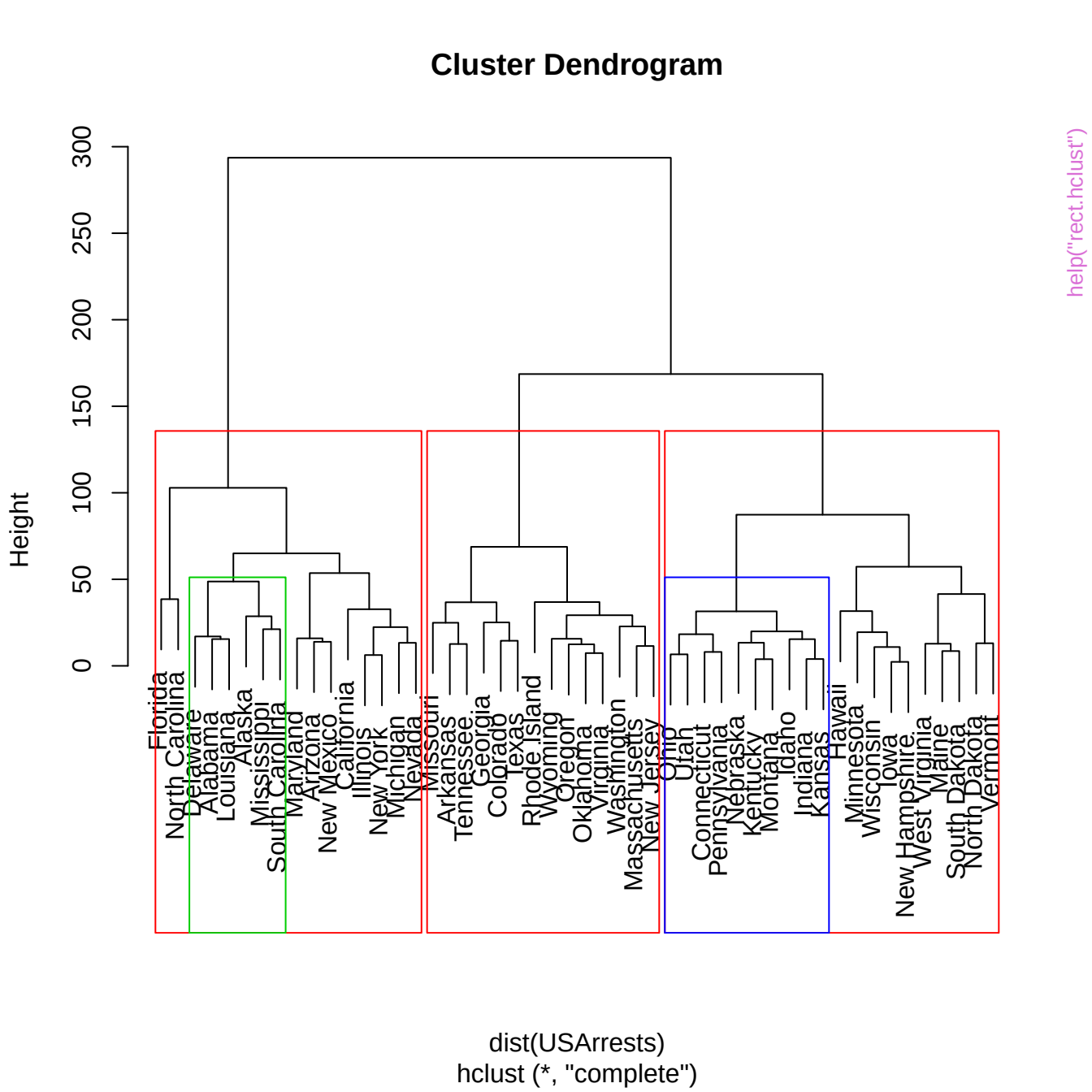

Normal Q−Q Plot
Sample Quantiles
Theoretical Quantiles
−4
−2
0
2
4
6
−3
−2
−1
0
1
2
3
help("qqnorm")

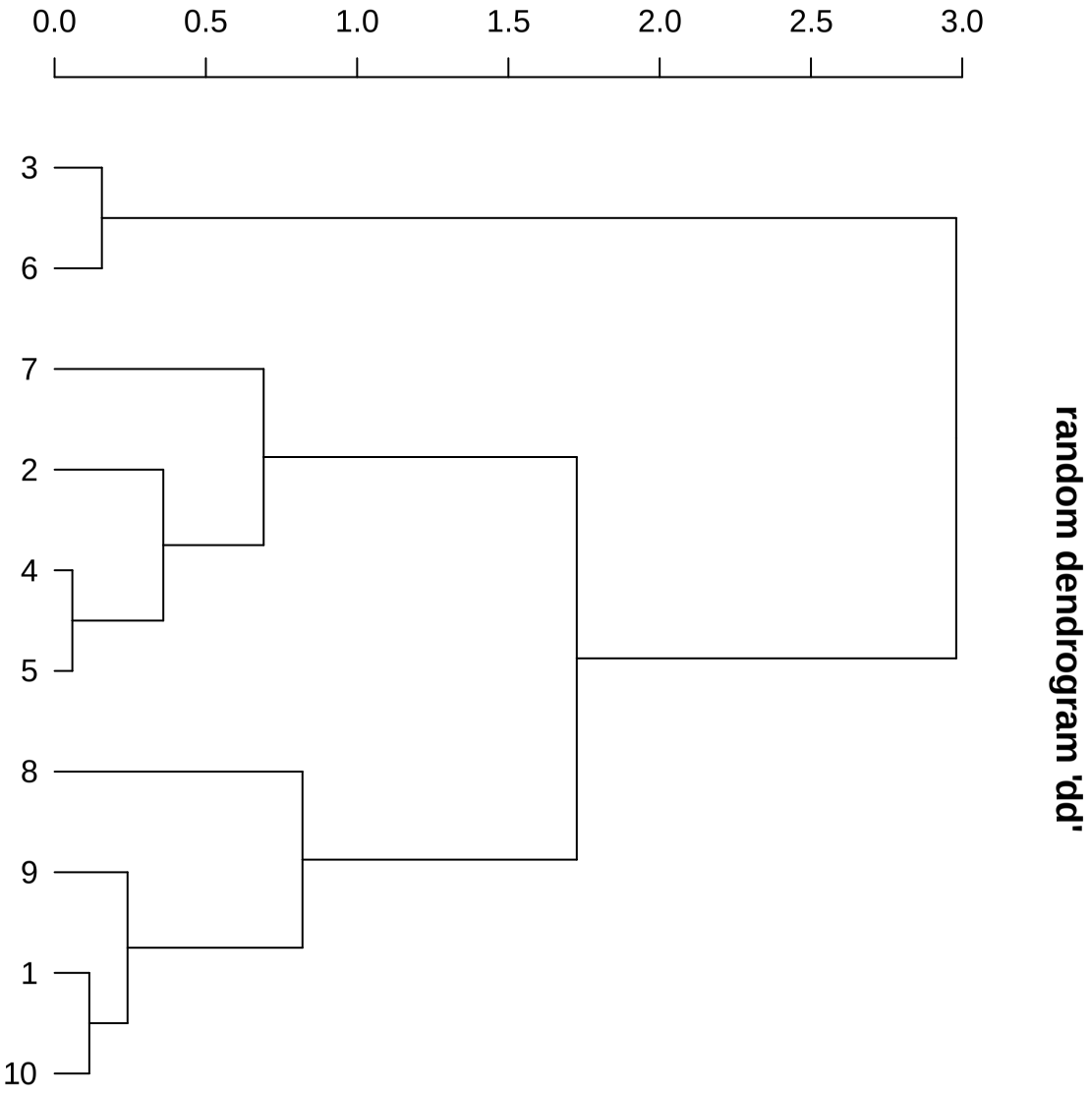


rt(300, df = 5)
y
−4
−2
0
2
4
6
−6
help("qqnorm")

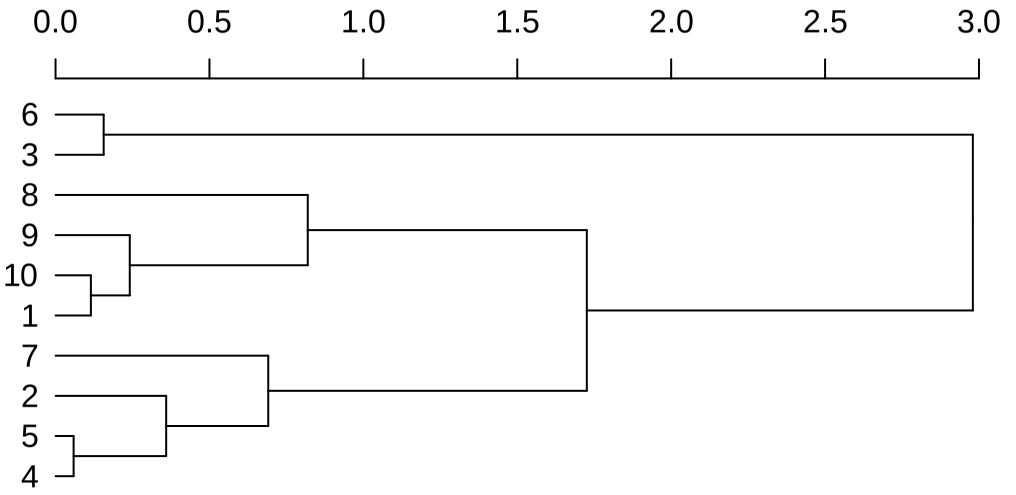

Normal Q−Q Plot
Precipitation [in/yr] for 70 US cities
Theoretical Quantiles
10
20
30
40
50
60
−2
−1
0
1
2
help("qqnorm")


Q−Q plot for $\chi^2_{\nu=3}$
qqline(*, dist = qchisq(., df=3), prob = c(0.1, 0.6))
y
qchisq(ppoints(500), df = 3)
0
2
4
6
8
10
12
0
5
10
15
help("qqnorm")

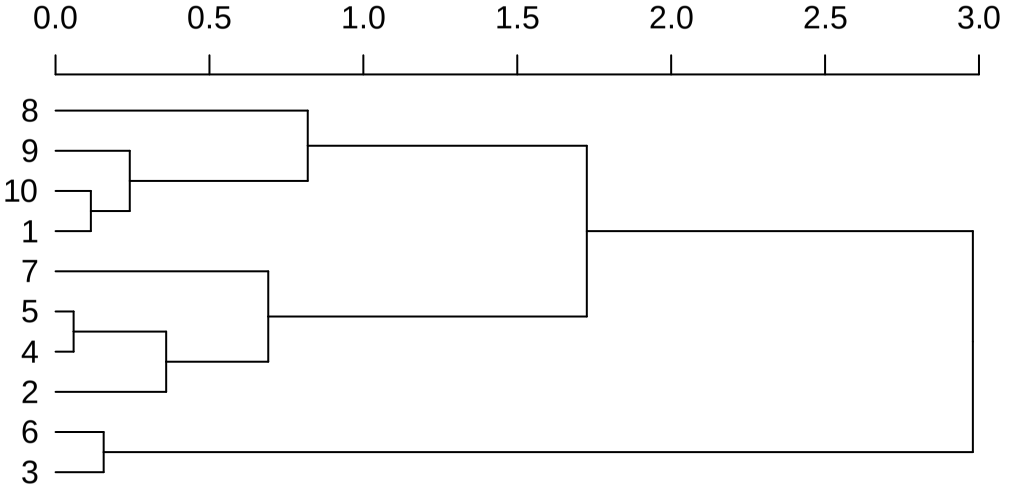

Cluster Dendrogram
Height
0
50
100
150
200
250
300
Florida
North Carolina
Delaware
Alabama
Louisiana
Alaska
Mississippi
South Carolina
Maryland
Arizona
New Mexico
California
Illinois
New York
Michigan
Nevada
Missouri
Arkansas
Tennessee
Georgia
Colorado
Texas
Rhode Island
Wyoming
Oregon
Oklahoma
Virginia
Washington
Massachusetts
New Jersey
Ohio
Utah
Connecticut
Pennsylvania
Nebraska
Kentucky
Montana
Idaho
Indiana
Kansas
Hawaii
Minnesota
Wisconsin
Iowa
New Hampshire
West Virginia
Maine
South Dakota
North Dakota
Vermont
dist(USArrests)
hclust (*, "complete")
help("rect.hclust")



help("reorder.dendrogram")

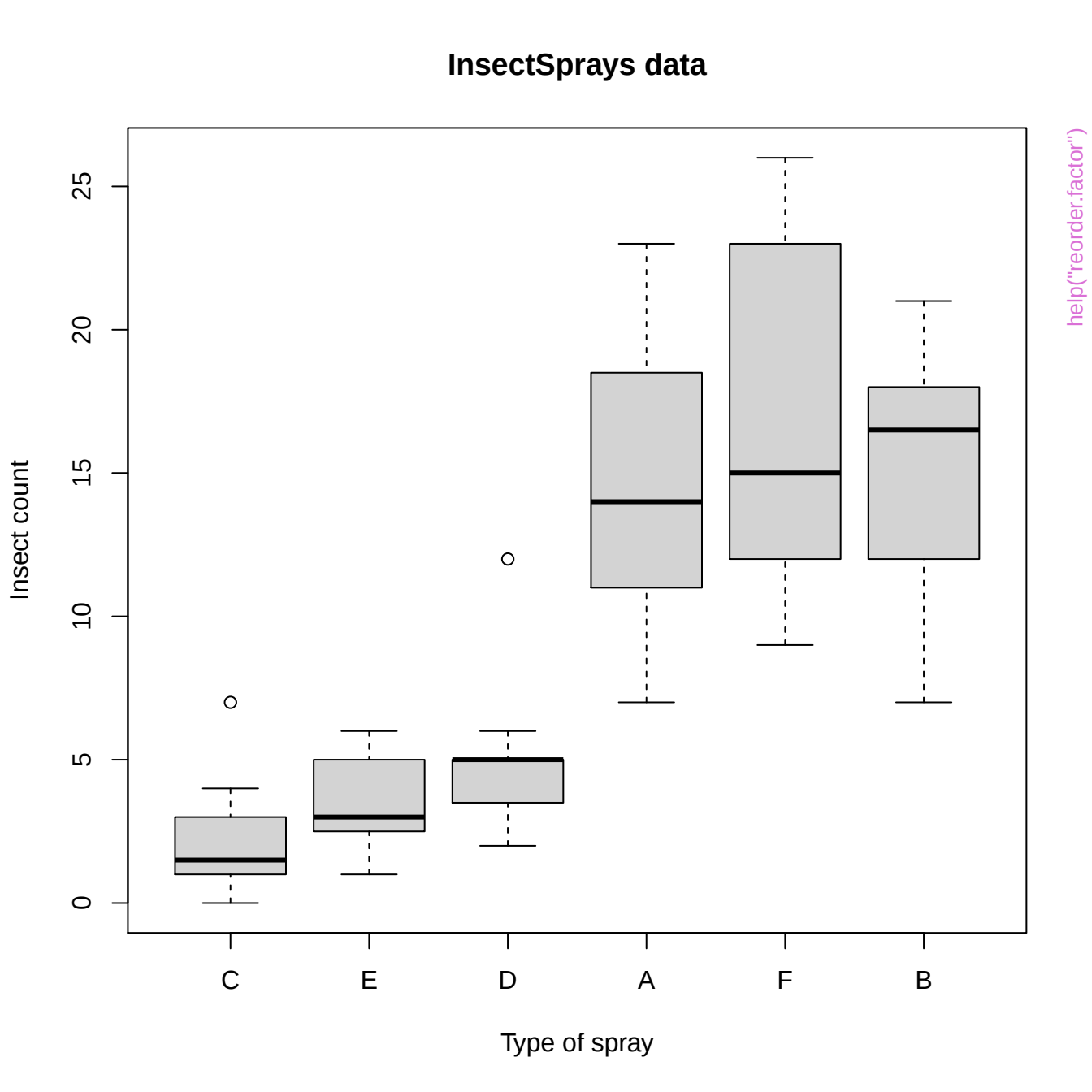


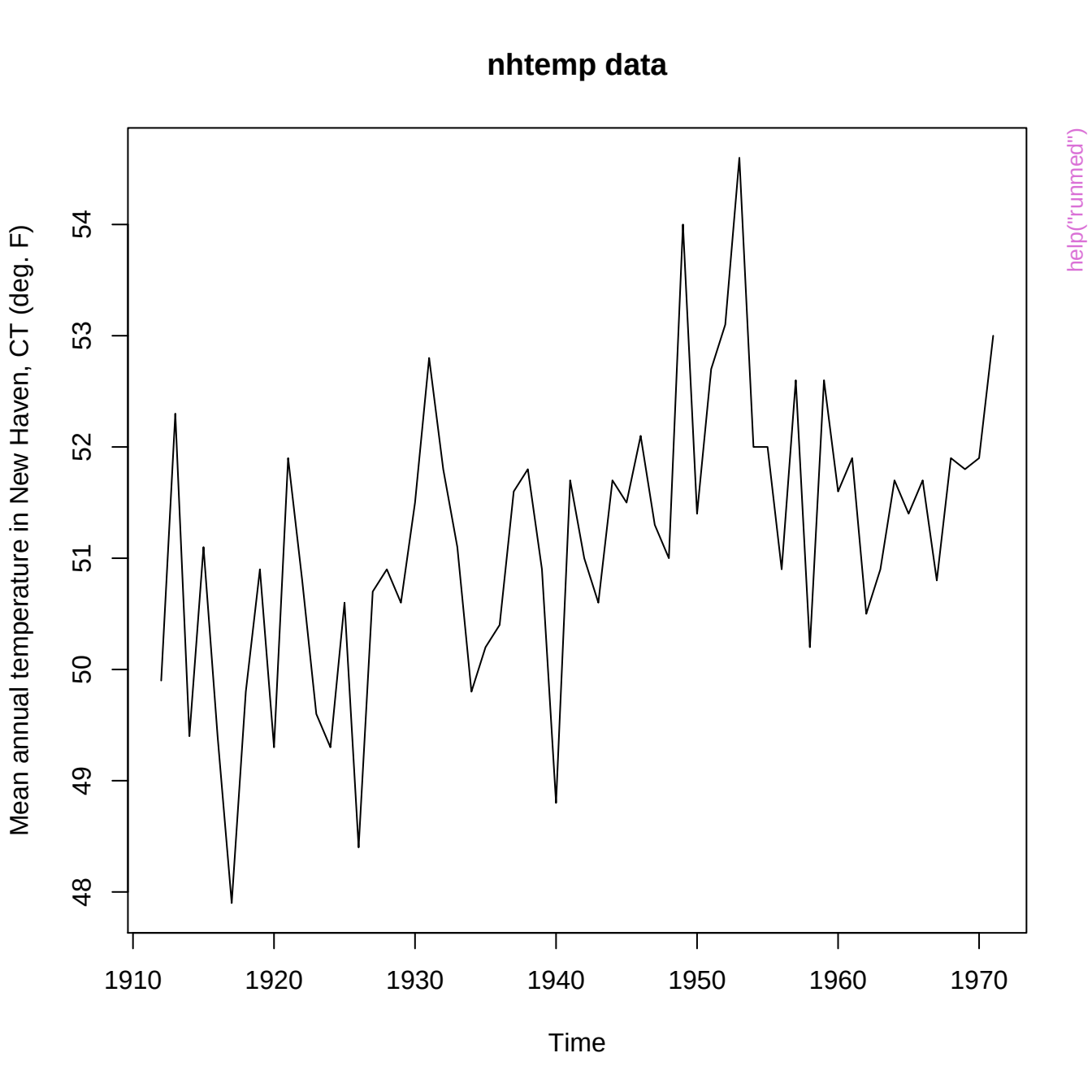
reorder(dd, 10:1)

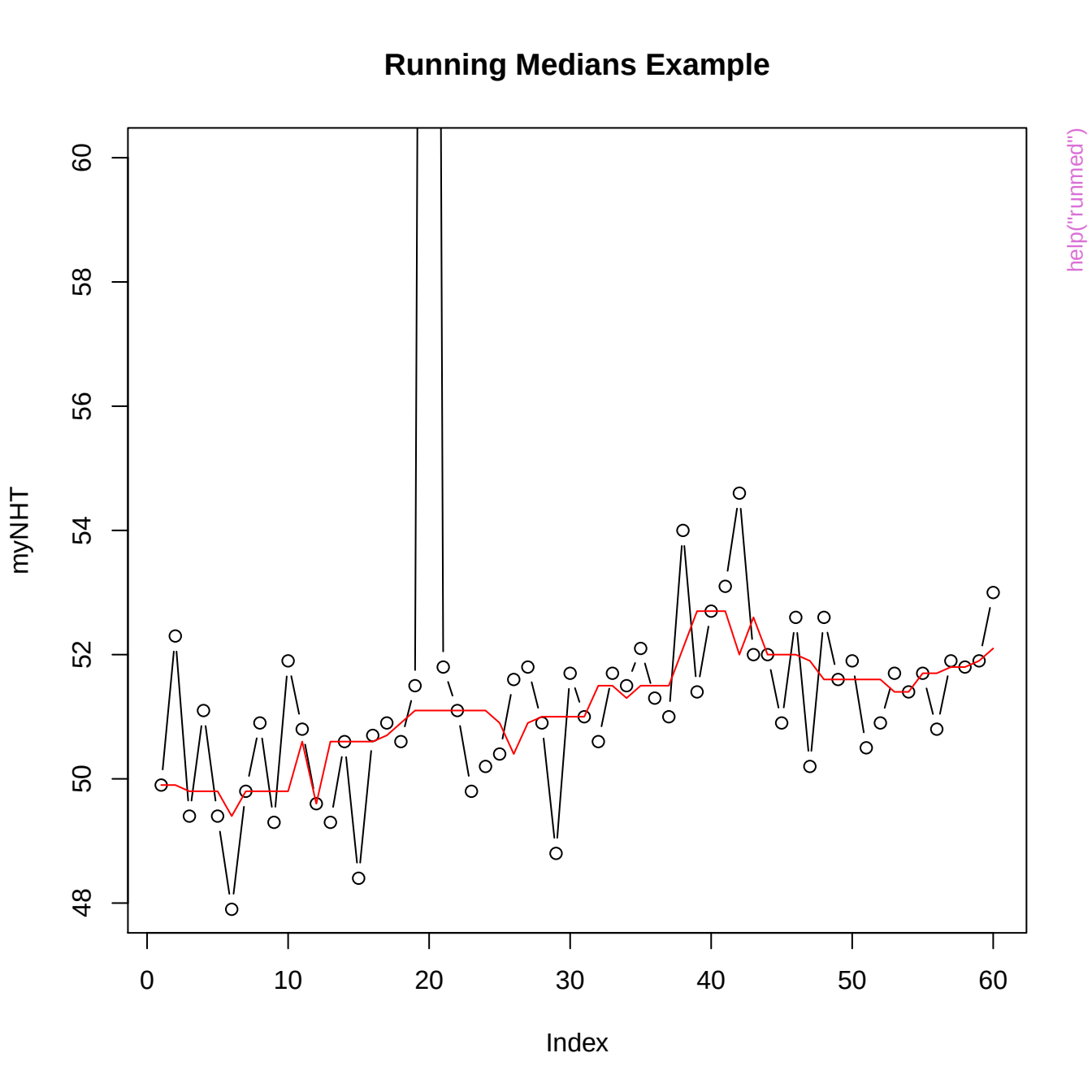


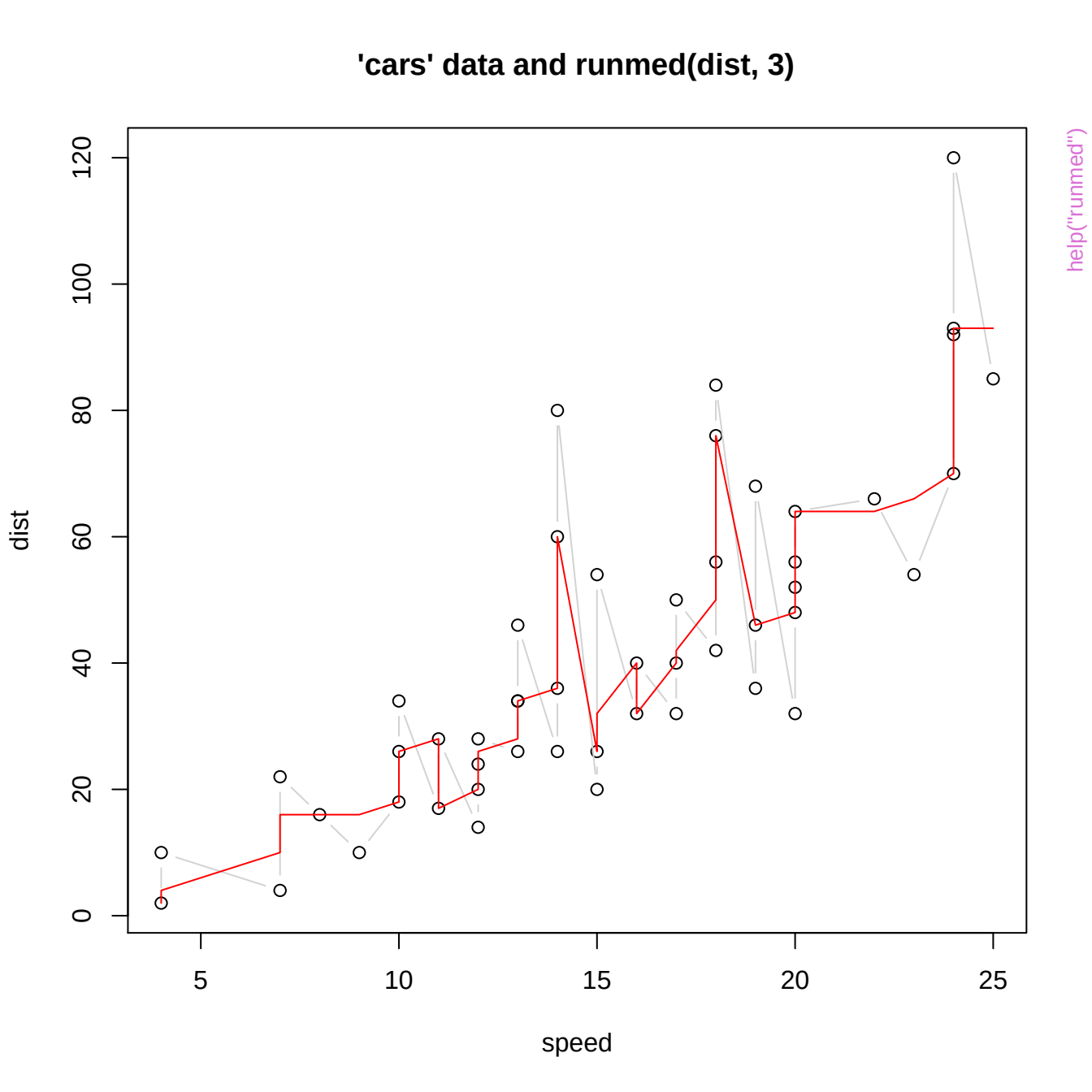
reorder(dd, 10:1, mean)

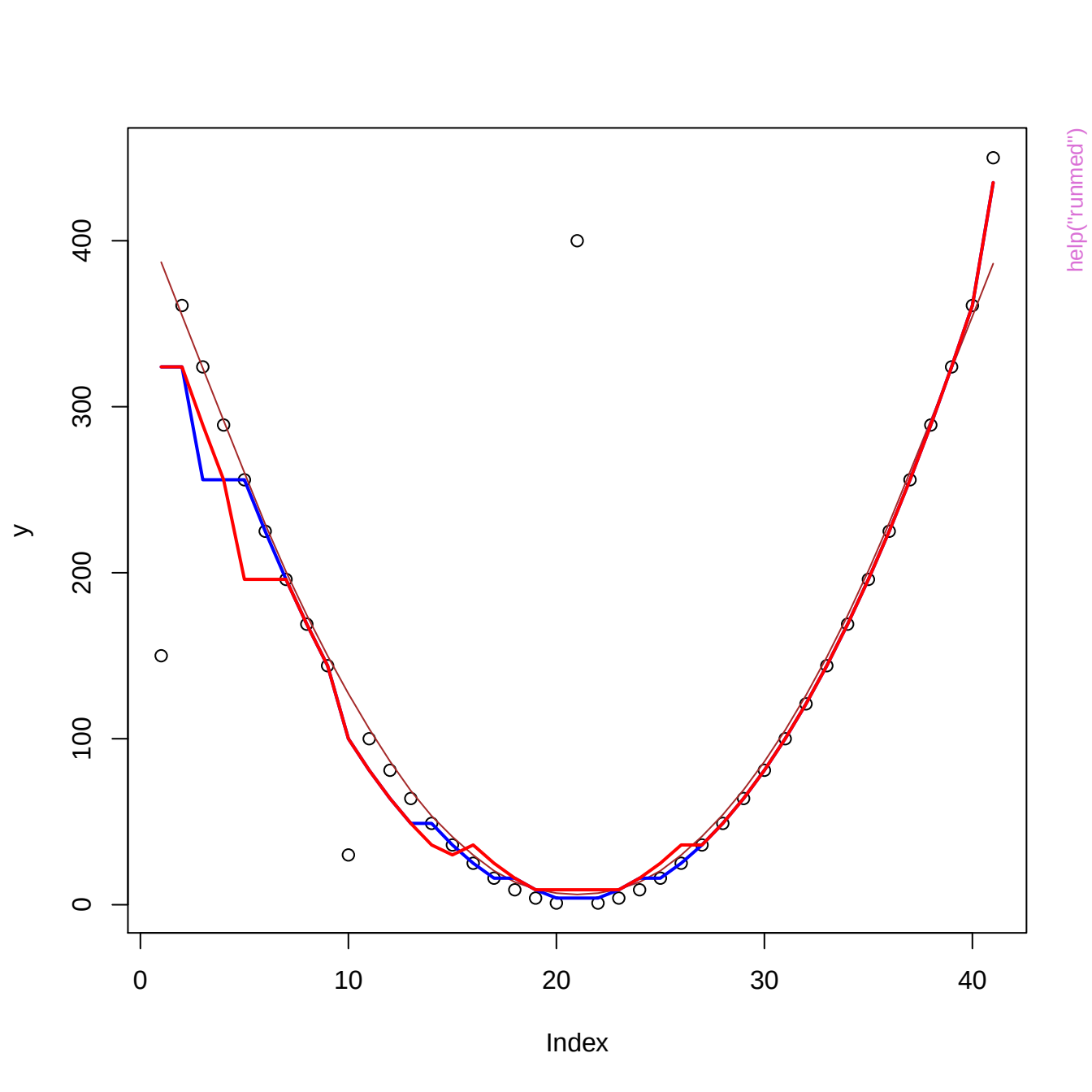
help("reorder.dendrogram")

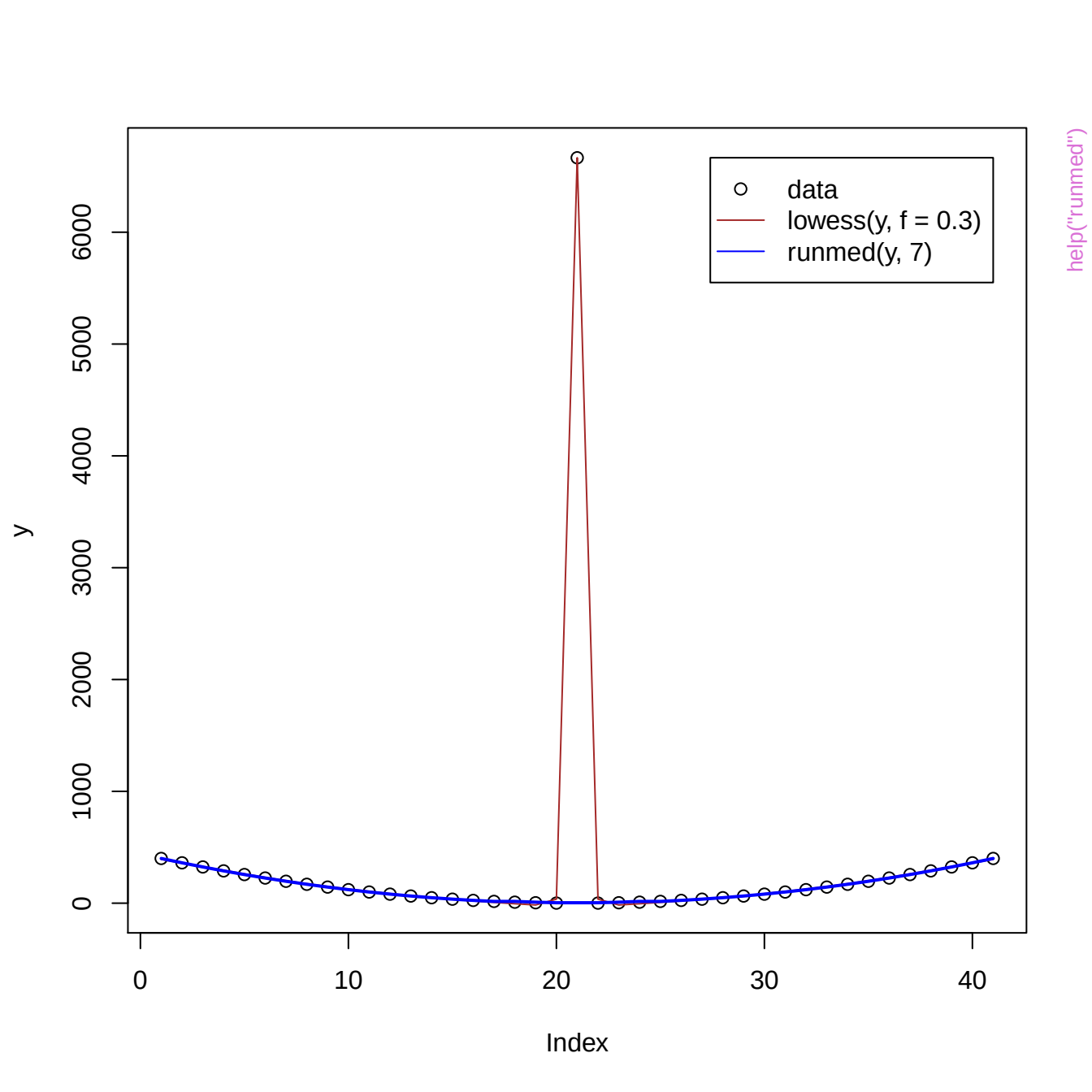

InsectSprays data
Insect count
0
5
10
15
20
25
C
E
D
A
F
B
Type of spray
help("reorder.factor")


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("runmed")

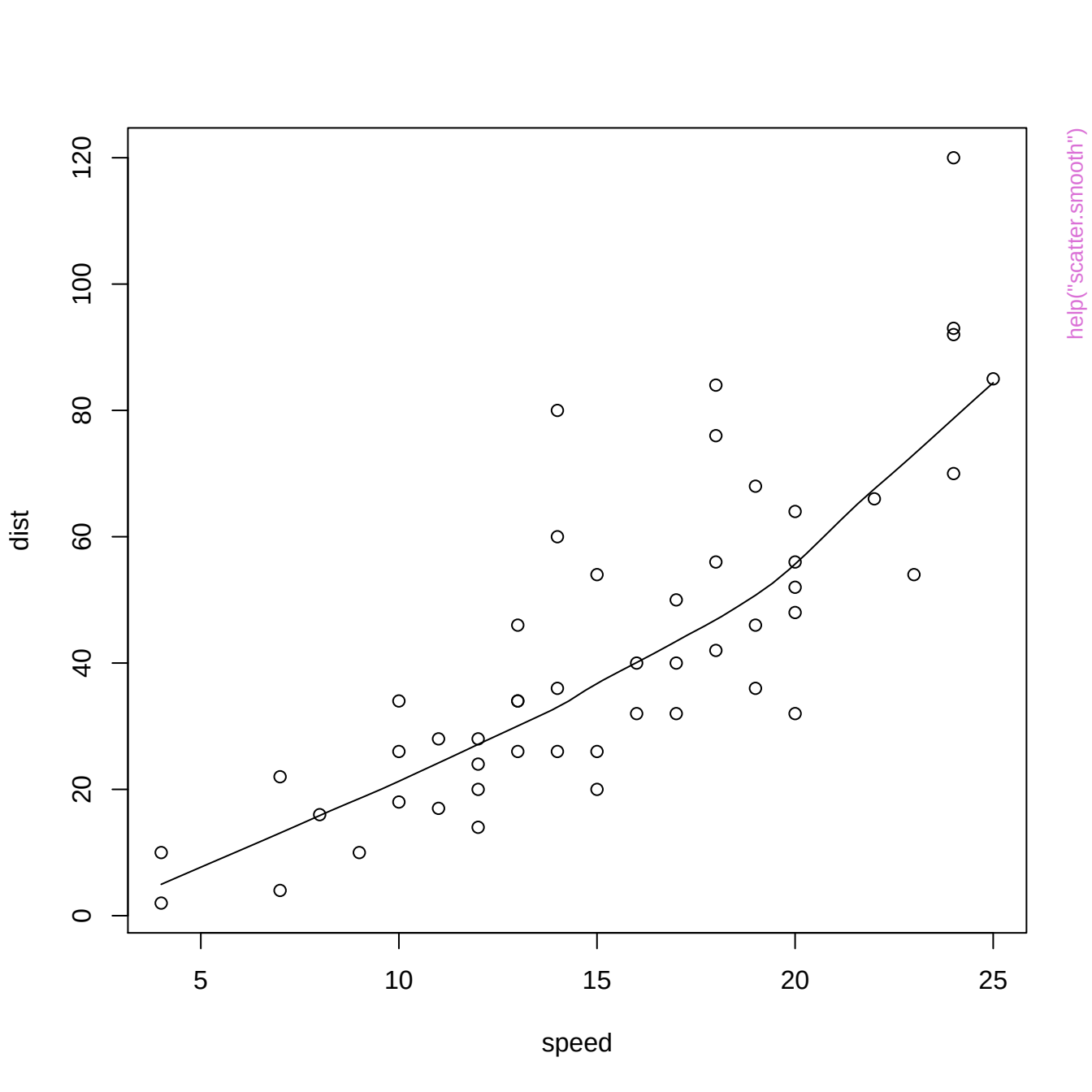

Running Medians Example
myNHT
Index
help("runmed")
48
50
52
54
56
58
60
0
10
20
30
40
50
60

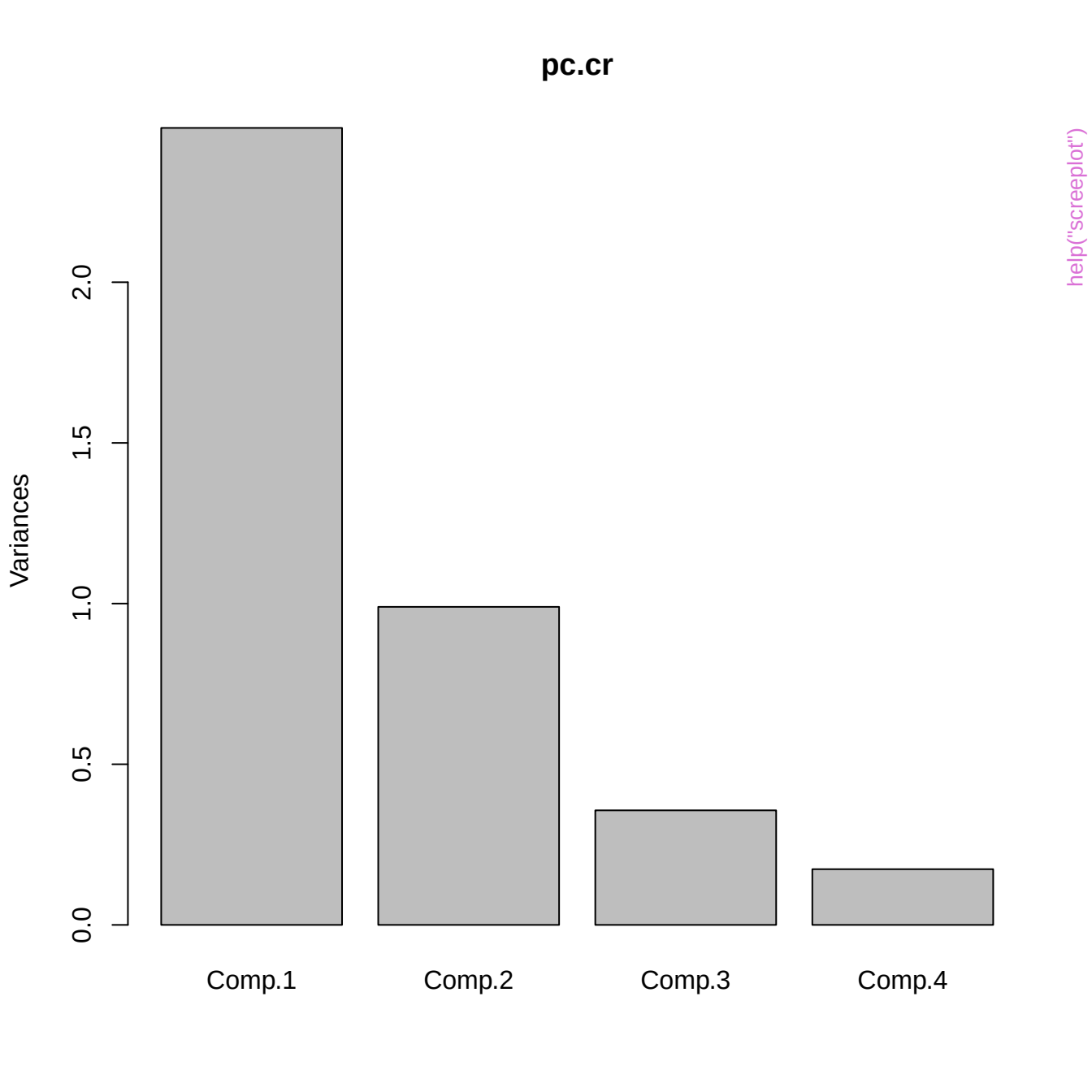

'cars' data and runmed(dist, 3)
dist
speed
0
20
40
60
80
100
120
5
10
15
20
25
help("runmed")

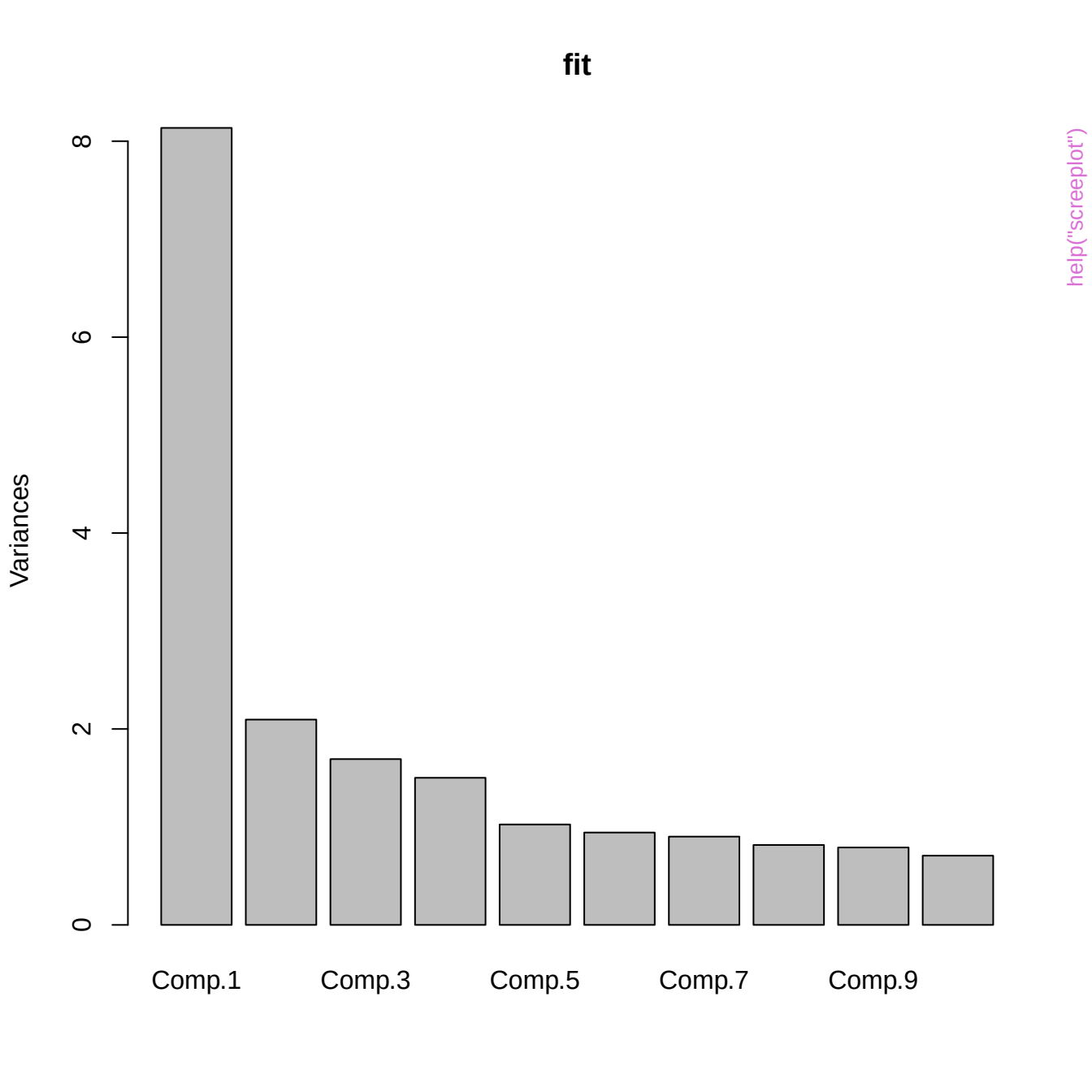

help("runmed")
y
Index
0
100
200
300
400
0
10
20
30
40

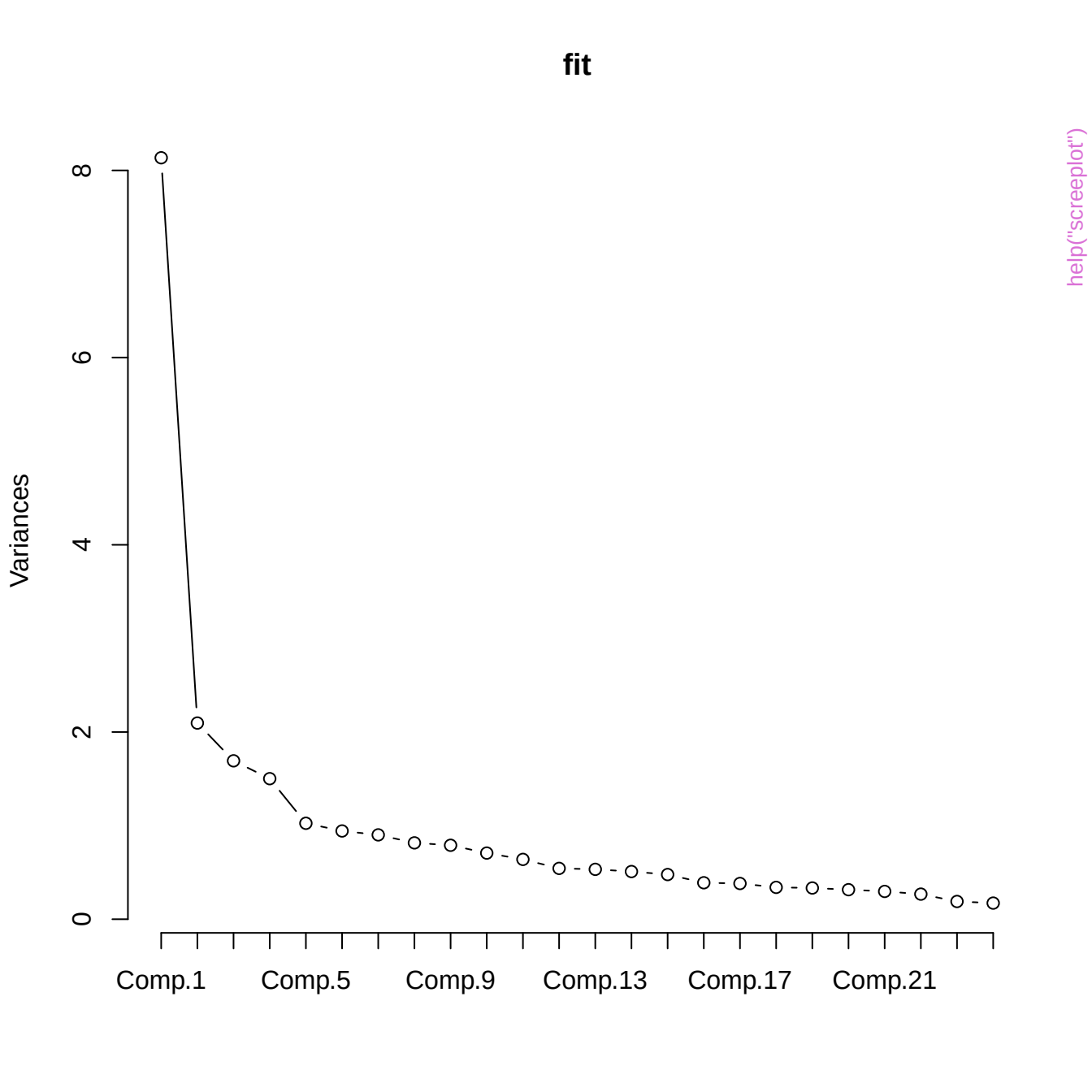

data
lowess(y, f = 0.3)
runmed(y, 7)
y
0
1000
2000
3000
4000
5000
6000
0
10
20
30
40
Index

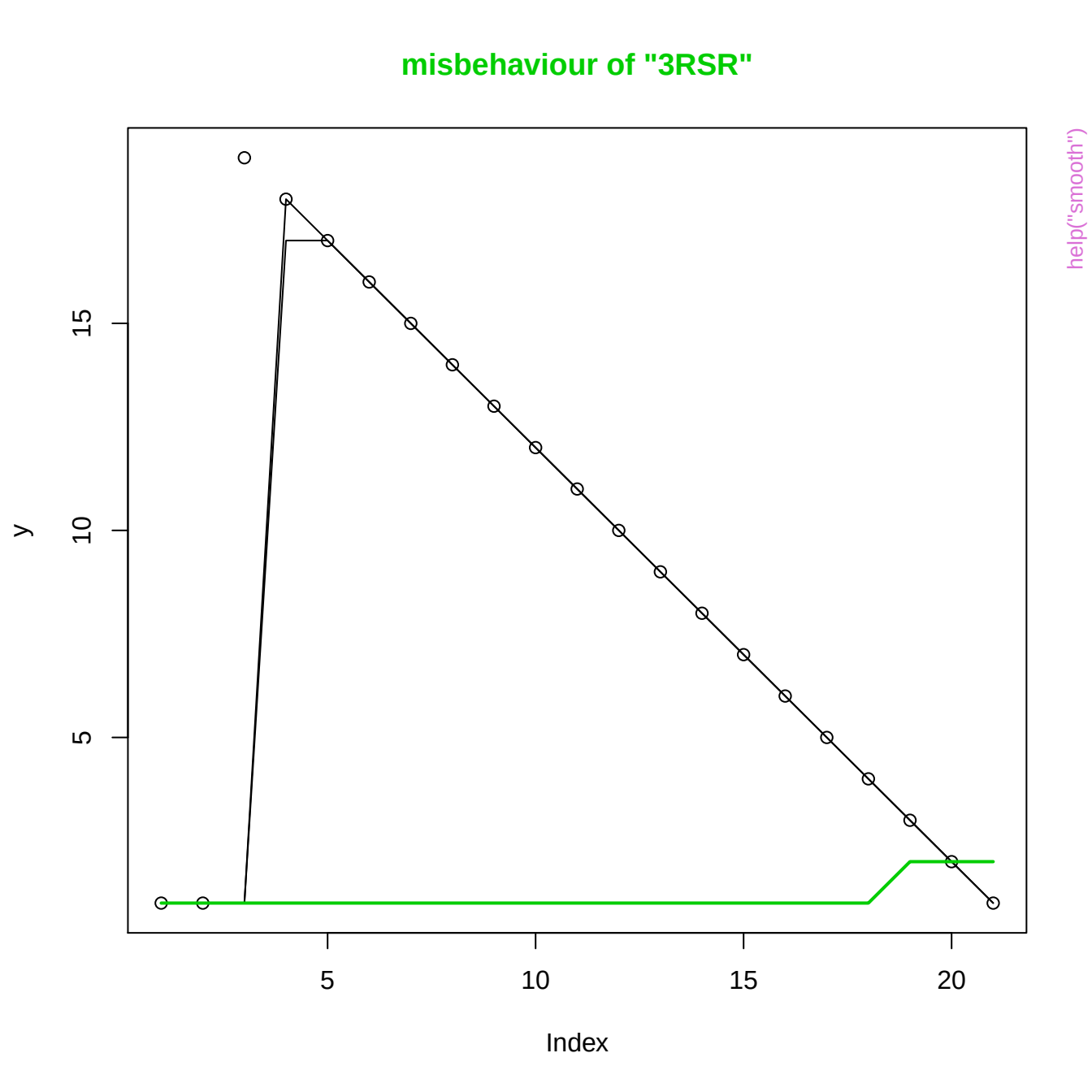
help("runmed")

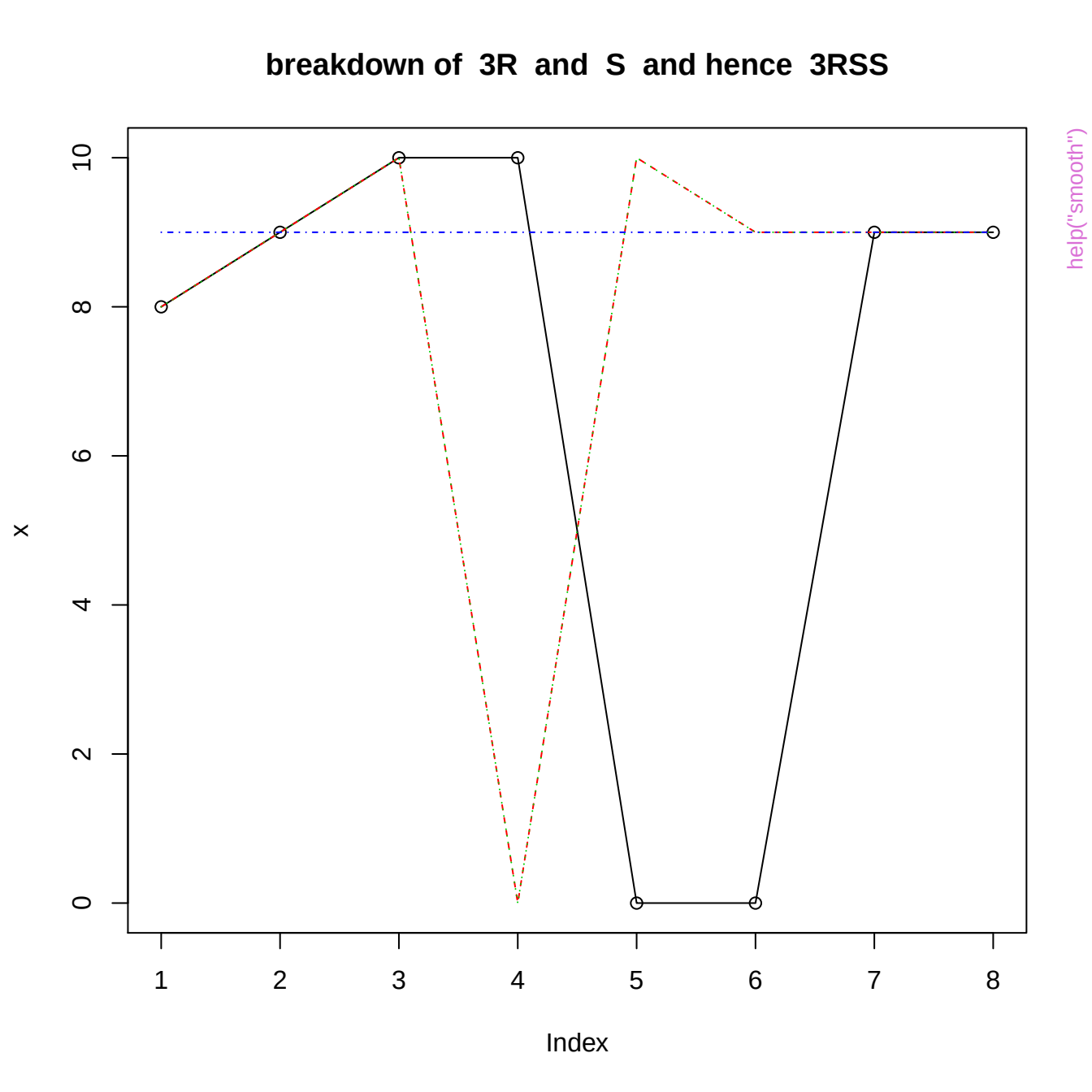

dist
speed
0
20
40
60
80
100
120
5
10
15
20
25
help("scatter.smooth")

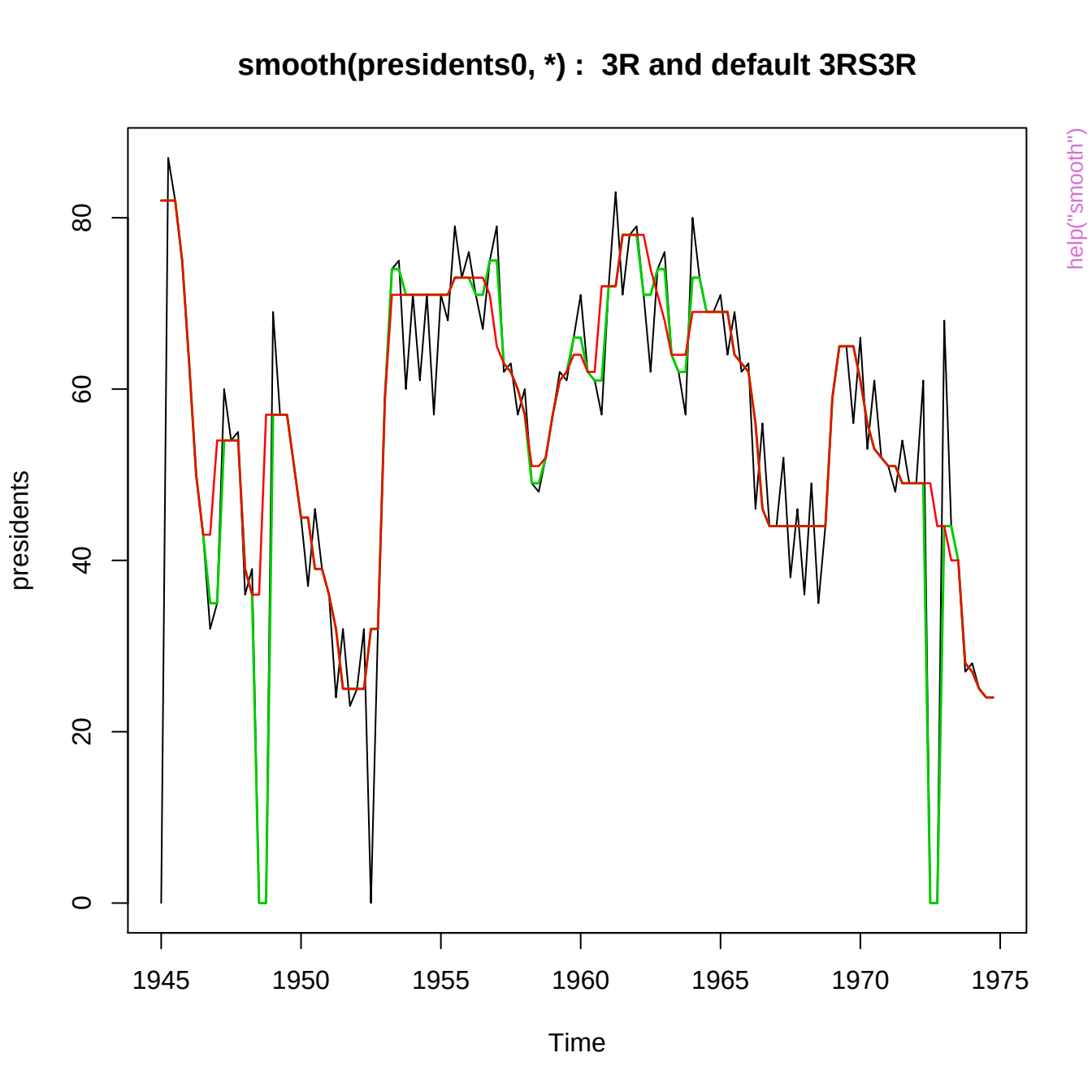

pc.cr
Variances
0.0
0.5
1.0
1.5
2.0
Comp.1
Comp.2
Comp.3
Comp.4
help("screeplot")

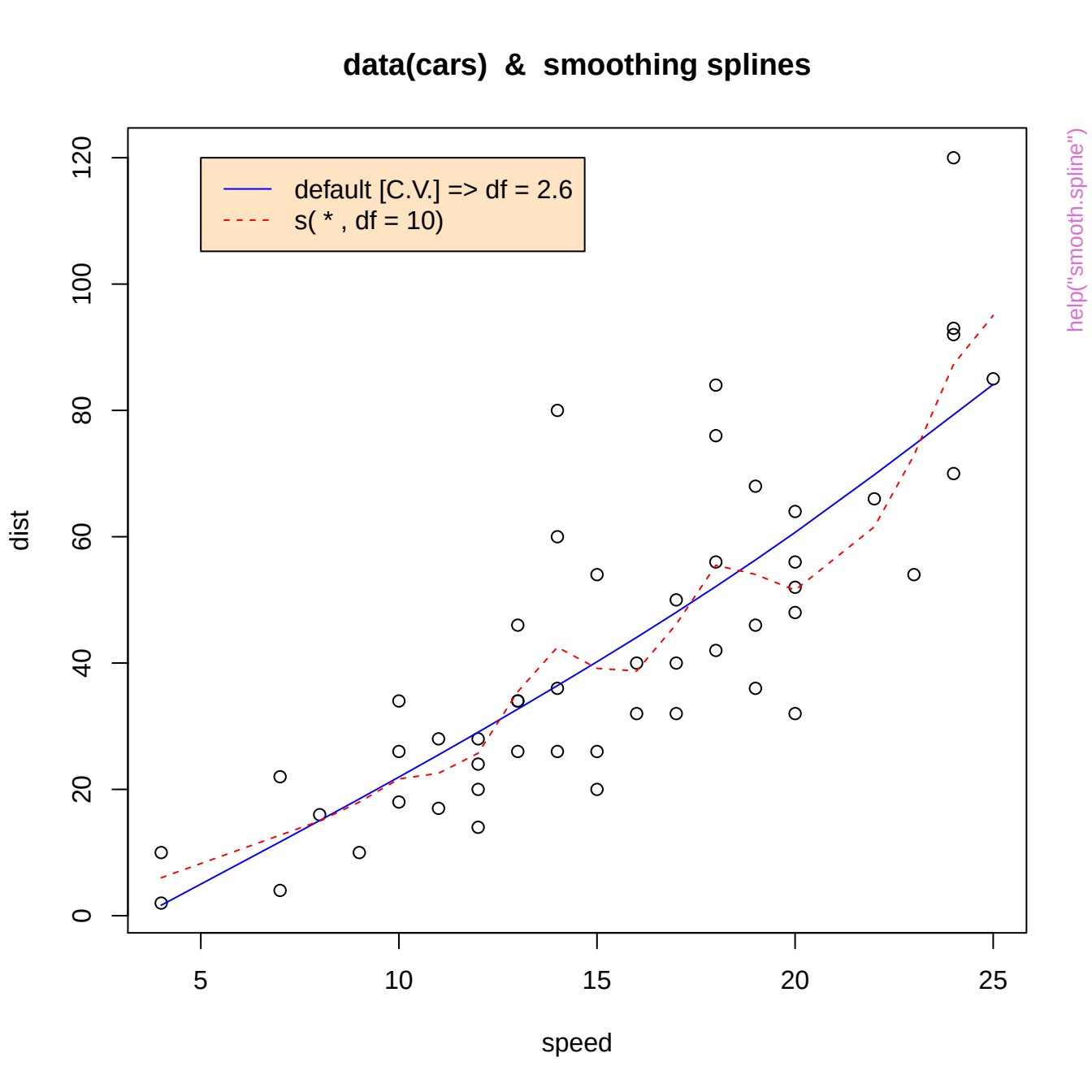

fit
Variances
0
2
4
6
8
Comp.1
Comp.3
Comp.5
Comp.7
Comp.9
help("screeplot")

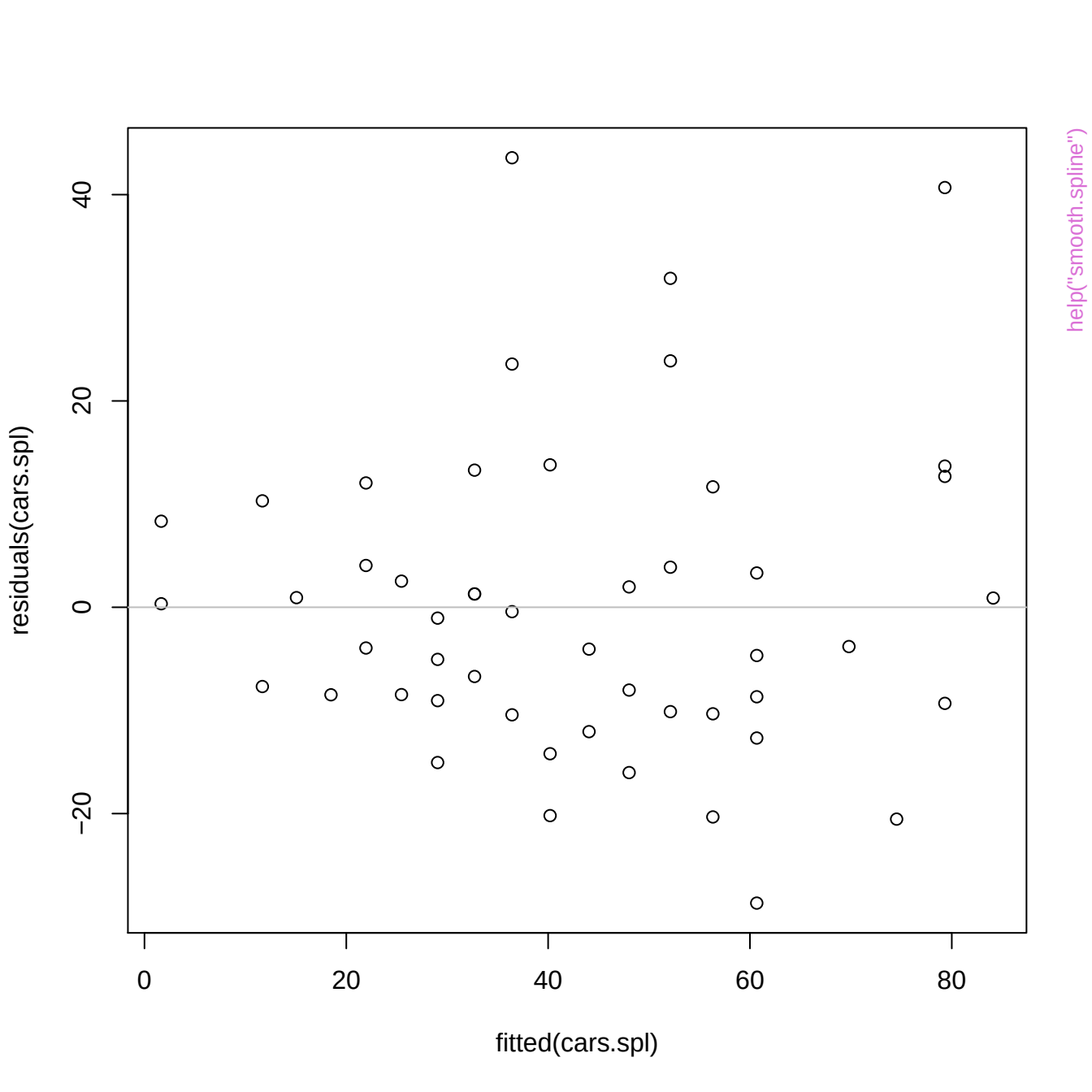

fit
Variances
0
2
4
6
8
Comp.1
Comp.5
Comp.9
Comp.13
Comp.17
Comp.21
help("screeplot")

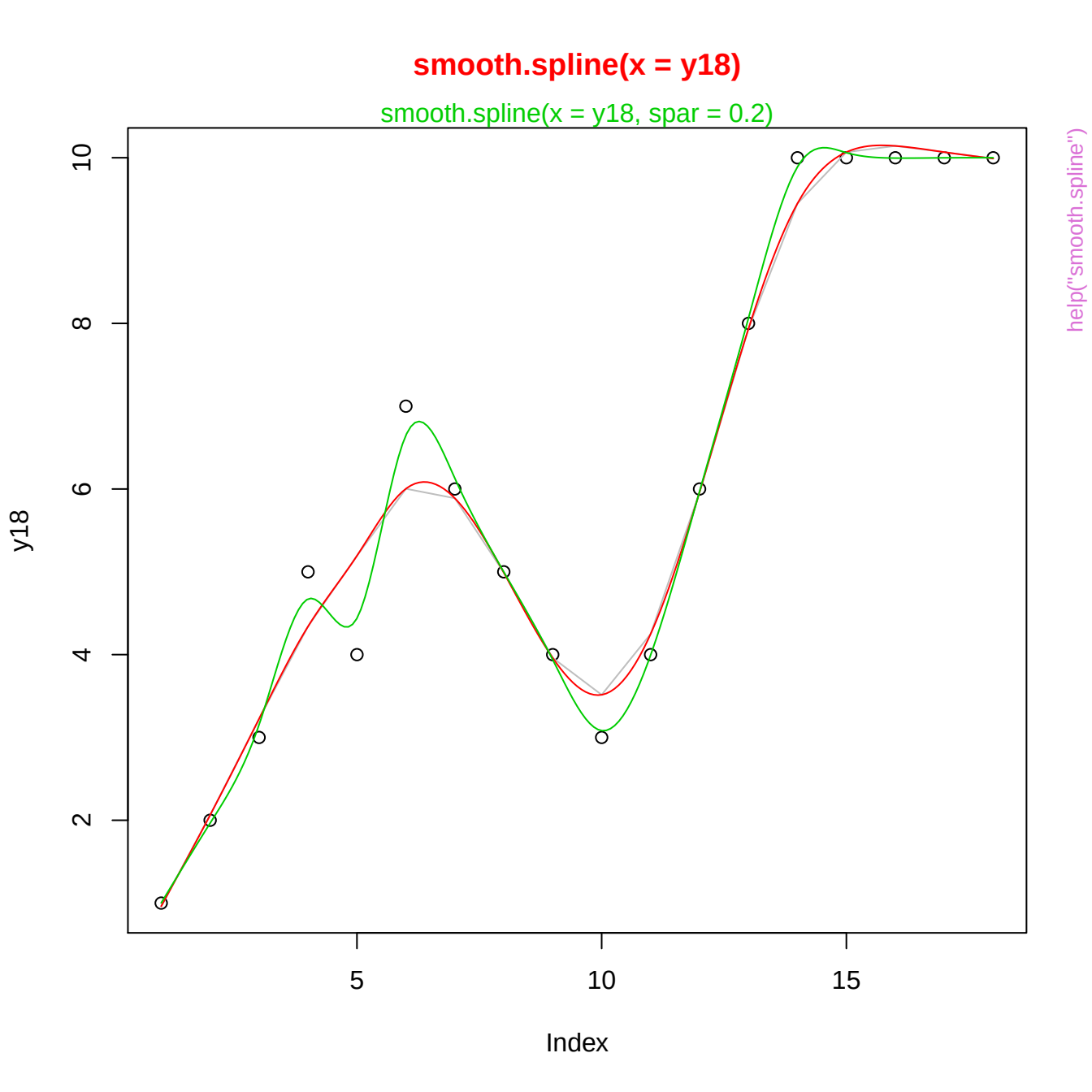

misbehaviour of "3RSR"
help("smooth")
y
5
10
15
5
10
15
20
Index

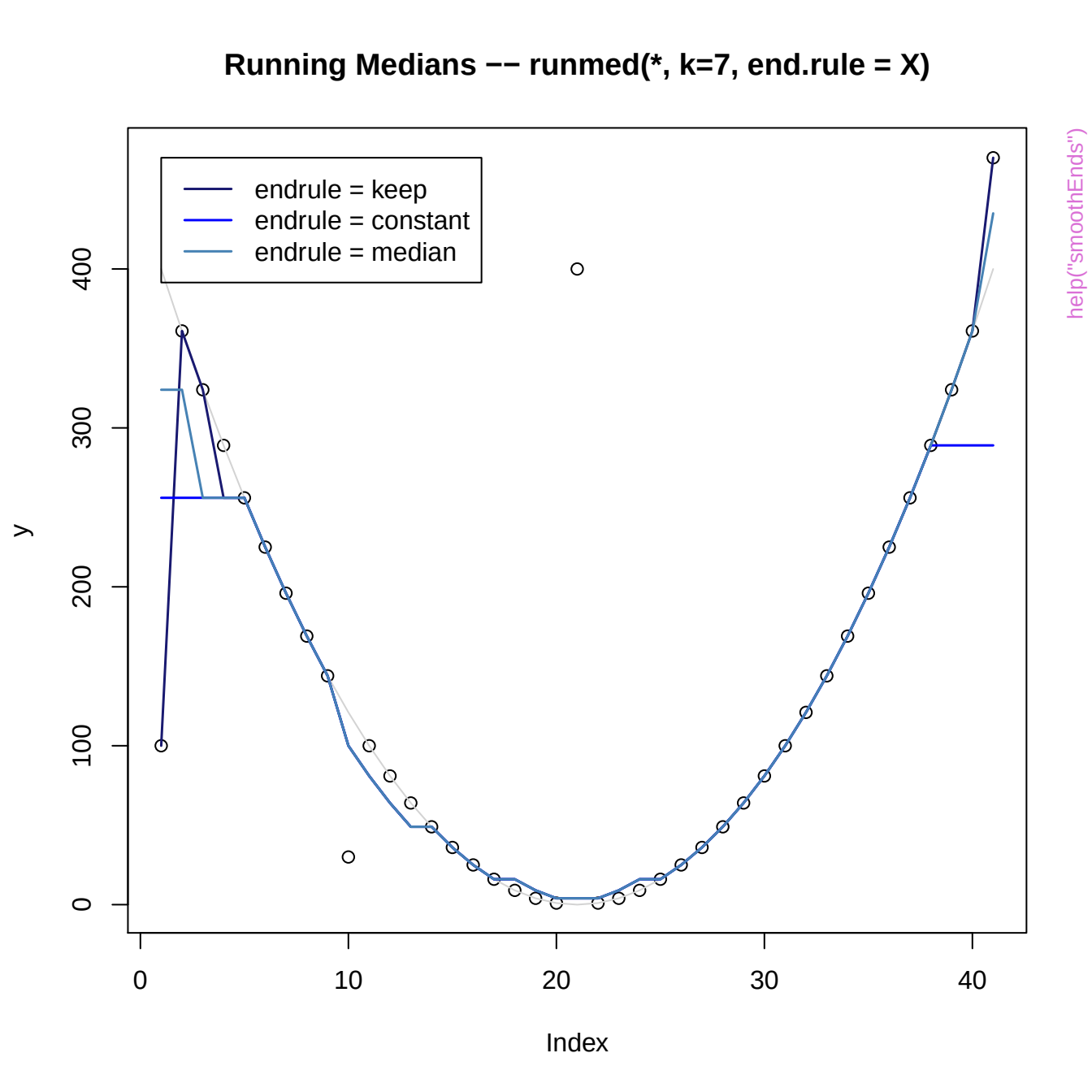

breakdown of 3R and S and hence 3RSS
x
Index
0
2
4
6
8
10
1
2
3
4
5
6
7
8
help("smooth")

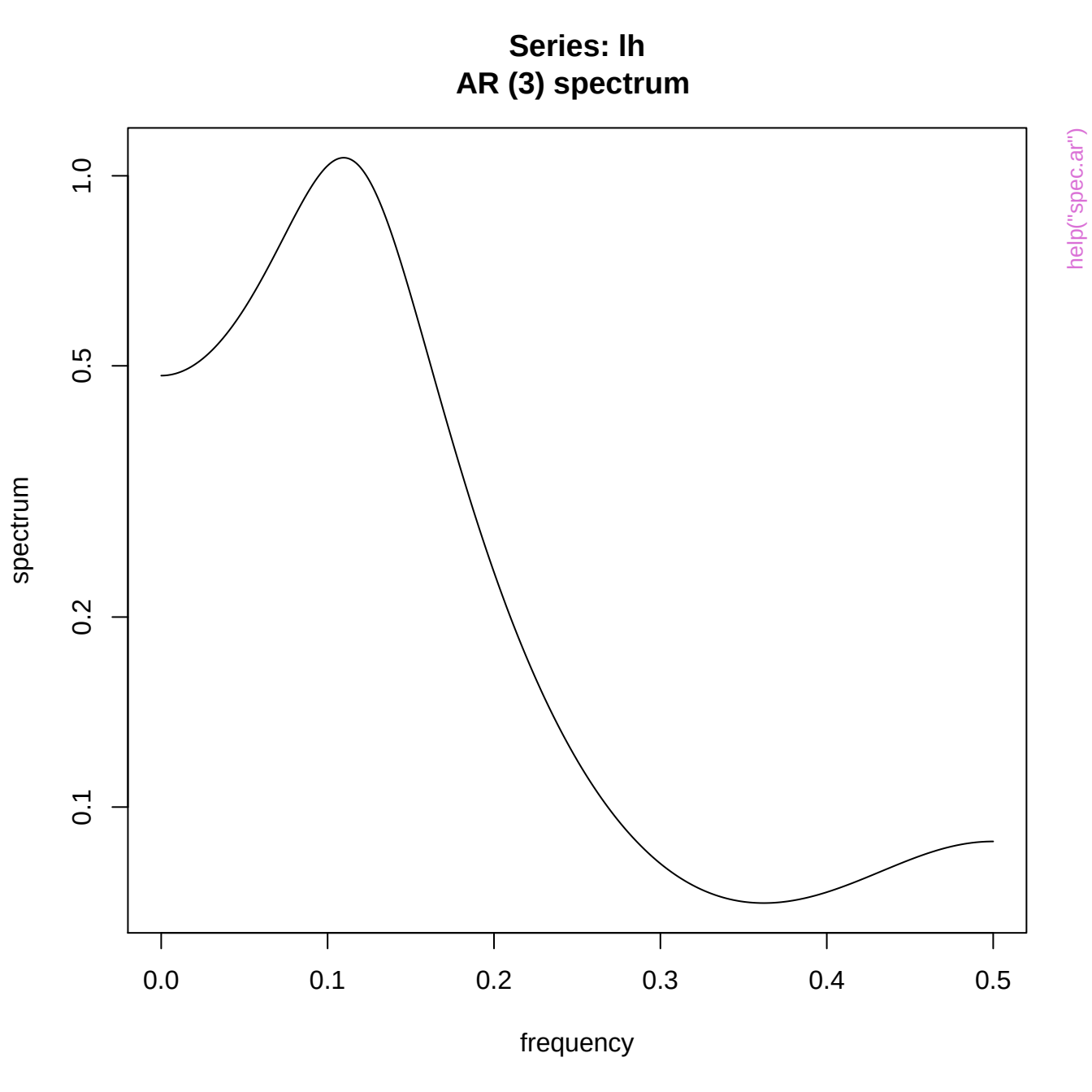

smooth(presidents0, *) : 3R and default 3RS3R
presidents
0
20
40
60
80
1945
1950
1955
1960
1965
1970
1975
Time
help("smooth")

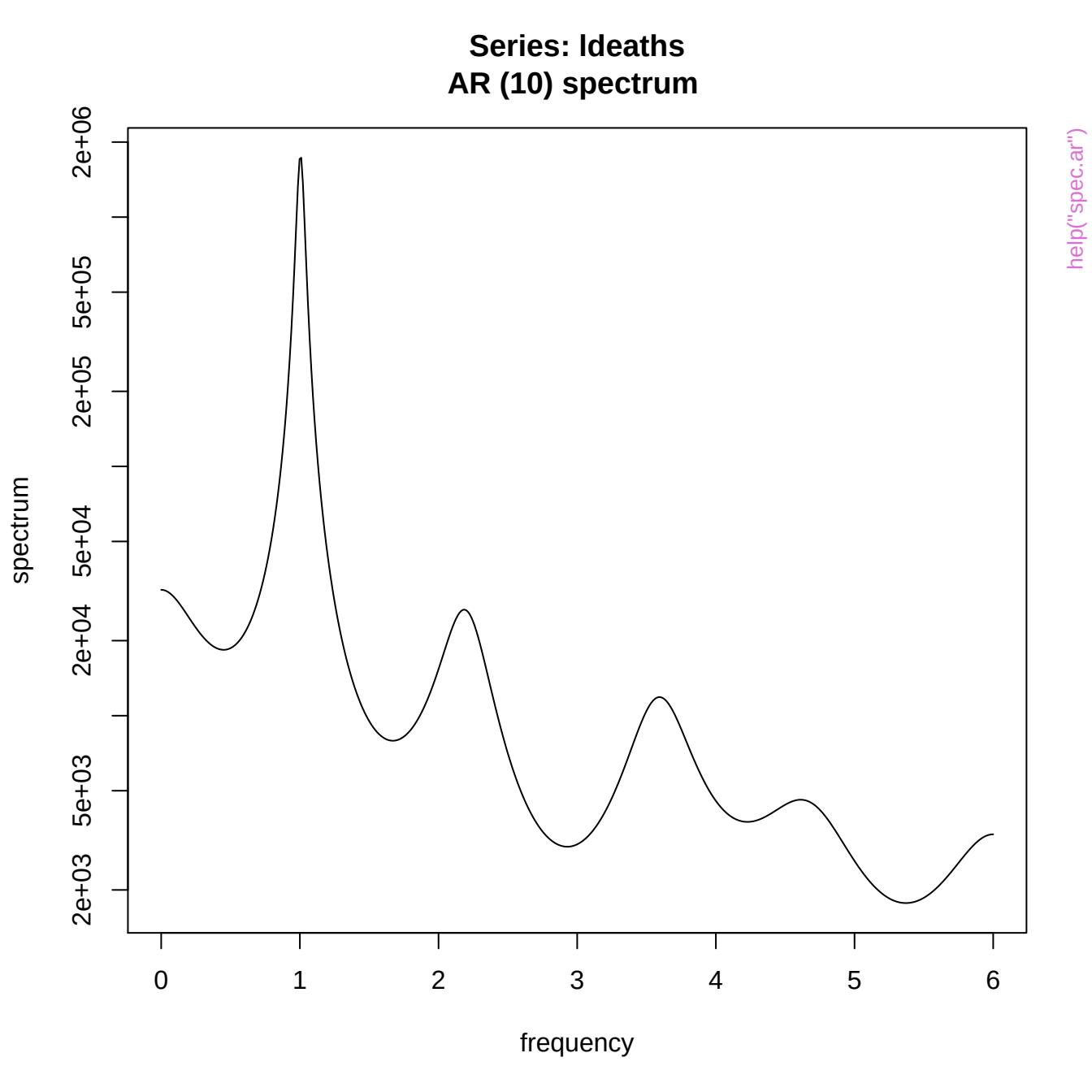

data(cars) & smoothing splines
default [C.V.] => df = 2.6
s(* , df = 10)
dist
speed
0
20
40
60
80
100
120
5
10
15
20
25
help("smooth.spline")

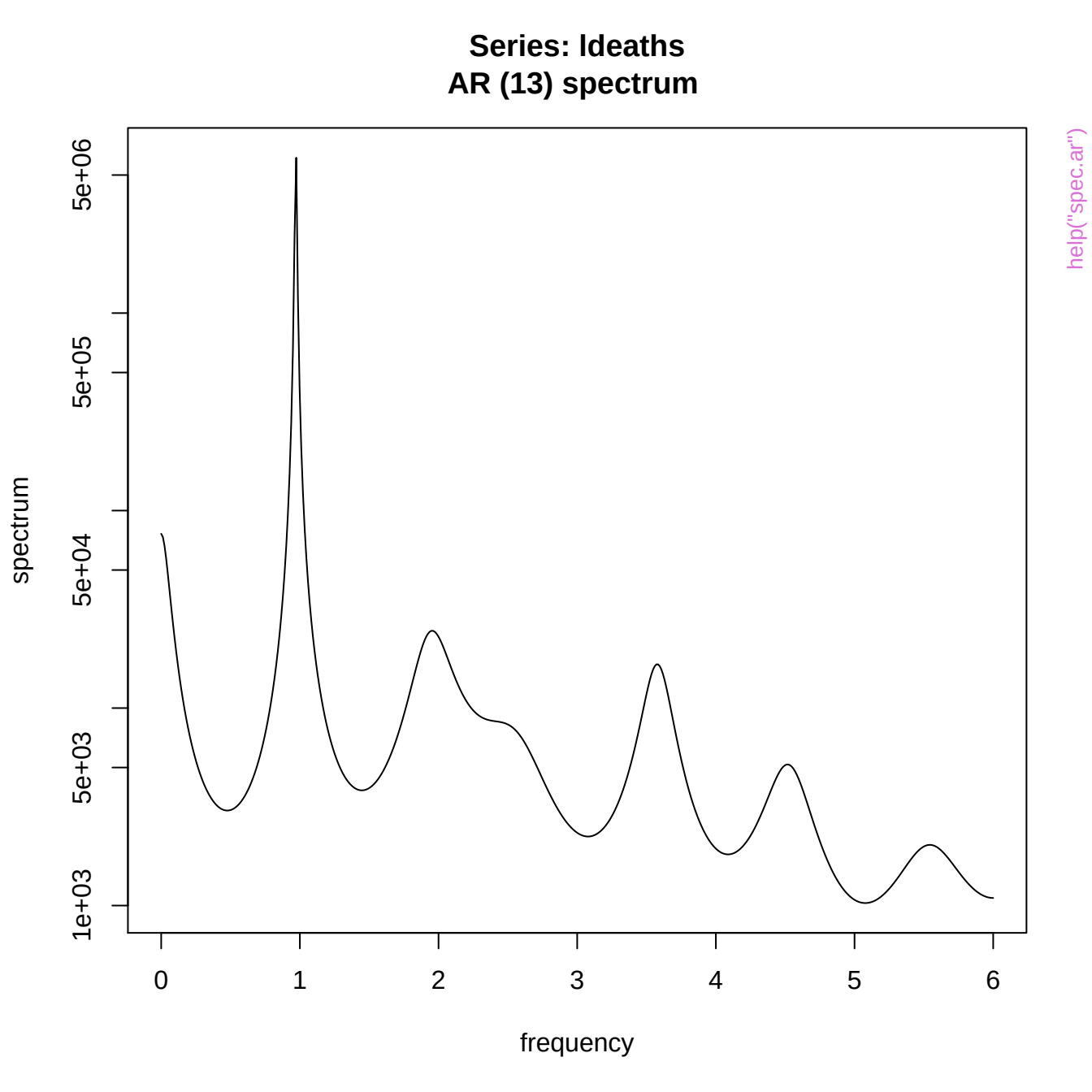

residuals(cars.spl)
fitted(cars.spl)
−20
0
20
40
0
20
40
60
80
help("smooth.spline")

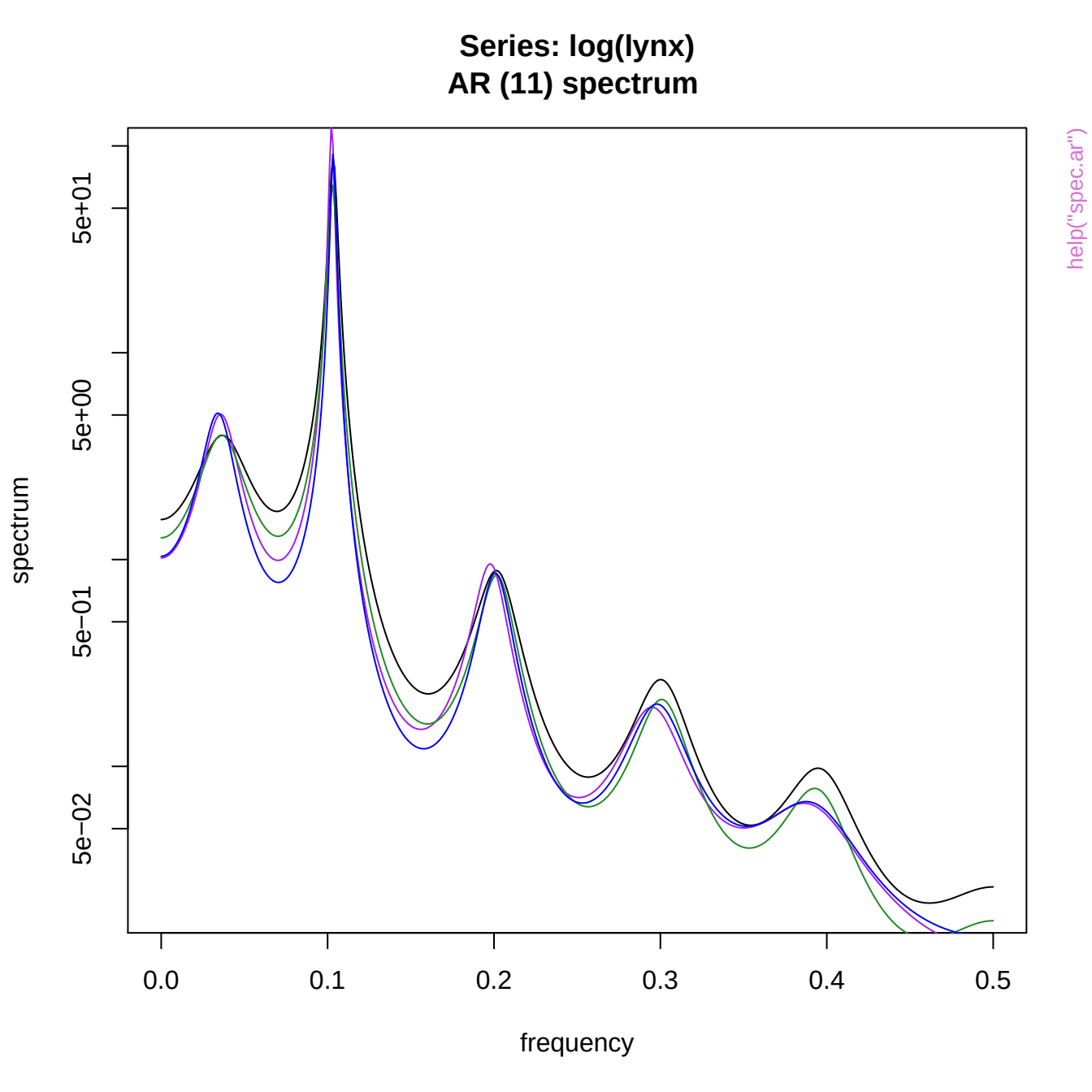

smooth.spline(x = y18)
smooth.spline(x = y18, spar = 0.2)
help("smooth.spline")
y18
Index
2
4
6
8
10
5
10
15

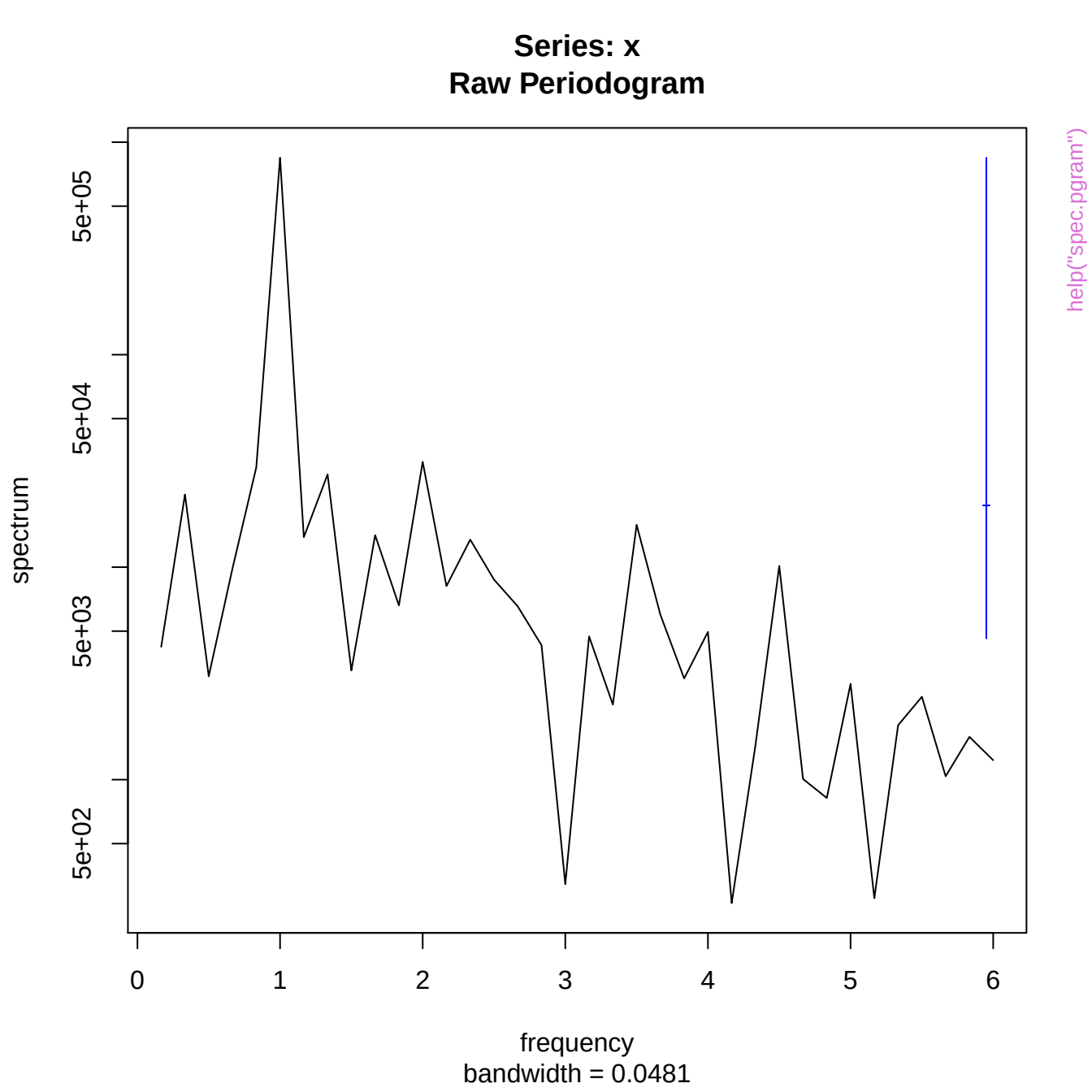

Running Medians −− runmed(*, k=7, end.rule = X)
endrule = keep
endrule = constant
endrule = median
y
0
100
200
300
400
0
10
20
30
40
Index
help("smoothEnds")

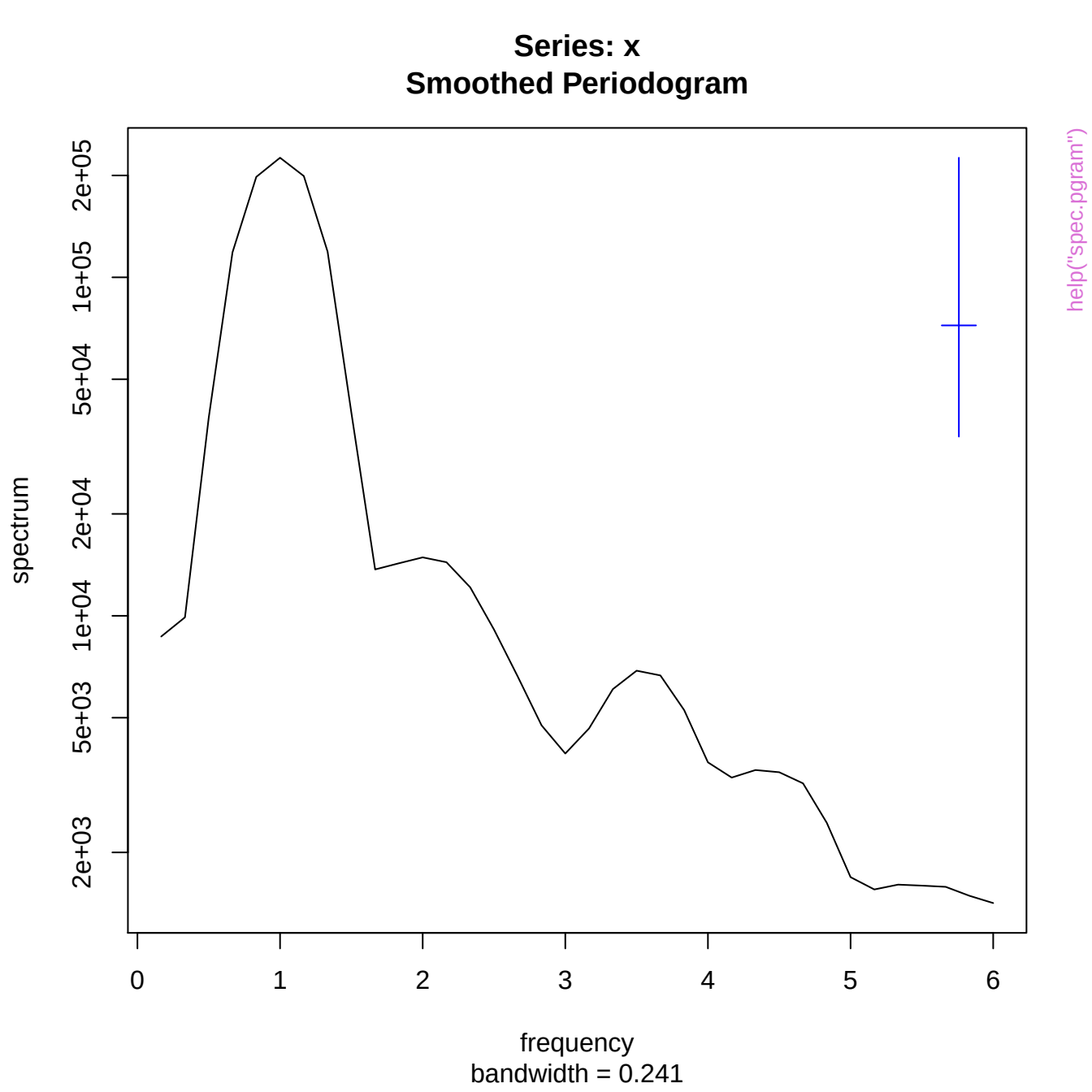

Series: lh
AR (3) spectrum
spectrum
0.1
0.2
0.5
1.0
0.0
0.1
0.2
0.3
0.4
0.5
frequency
help("spec.ar")

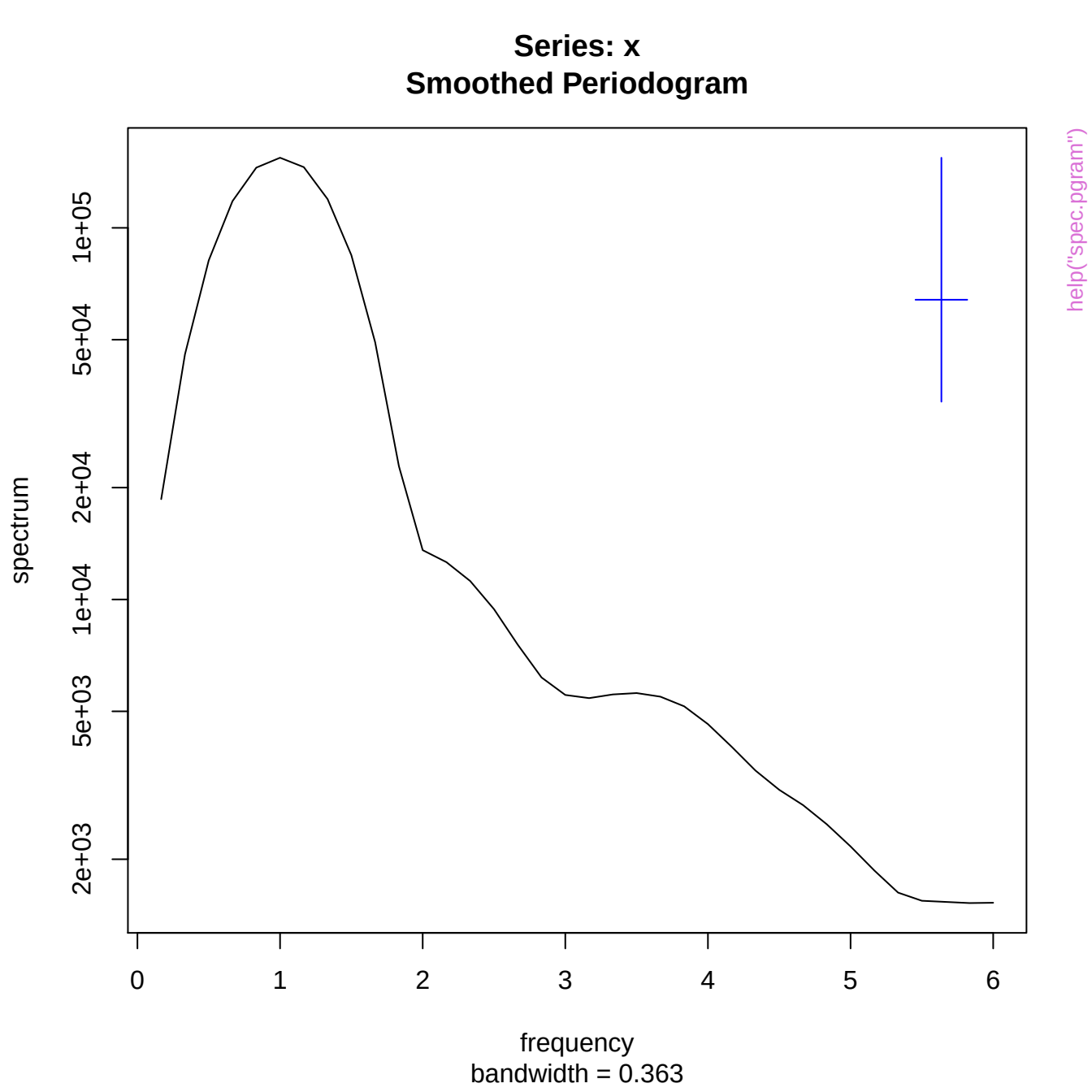

Series: ldeaths
AR (10) spectrum
spectrum
2e+06
5e+05
2e+05
5e+04
2e+04
5e+03
2e+03
0
1
2
3
4
5
6
frequency
help("spec.ar")

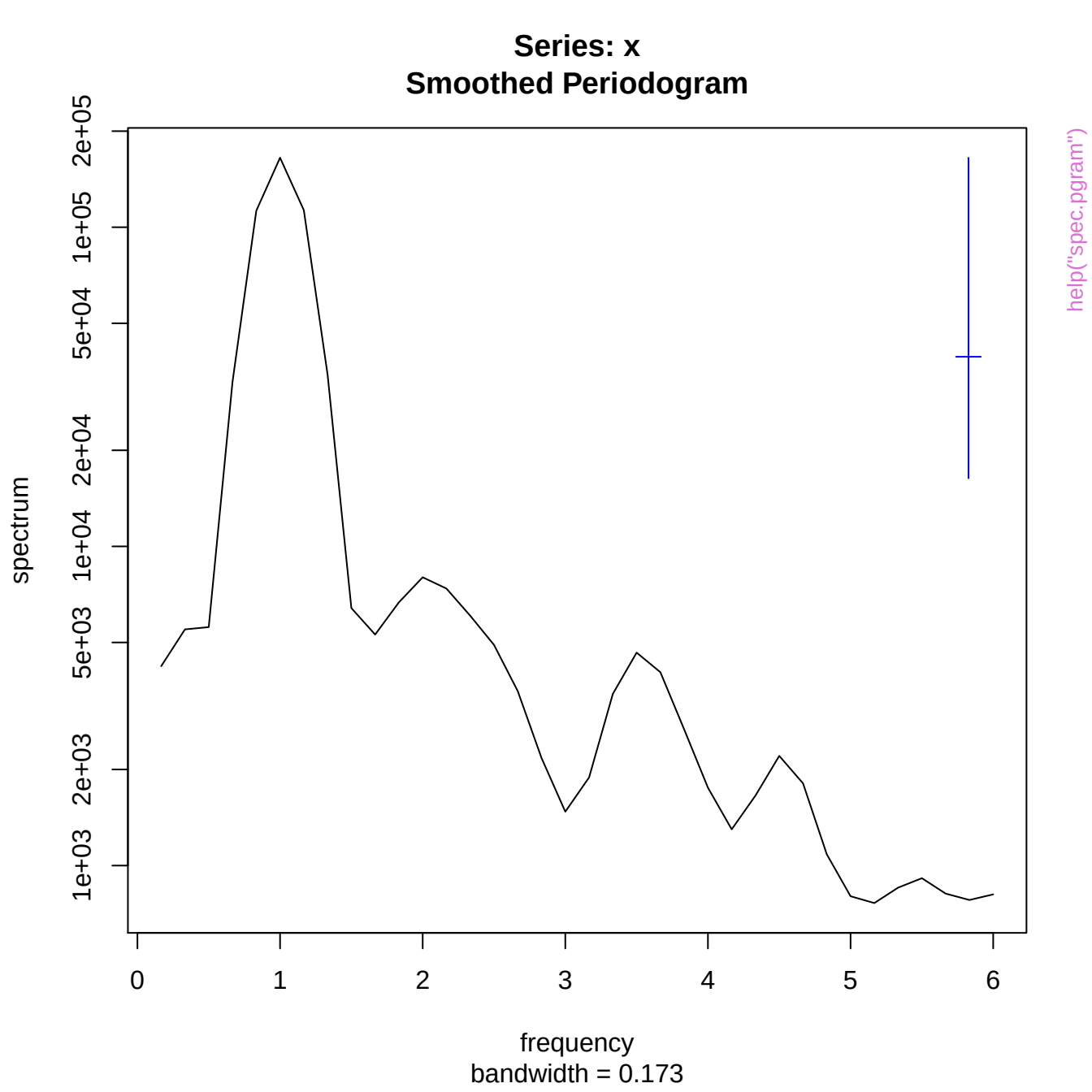

Series: ldeaths
AR (13) spectrum
spectrum
1e+03
5e+03
5e+04
5e+05
5e+06
0
1
2
3
4
5
6
frequency
help("spec.ar")

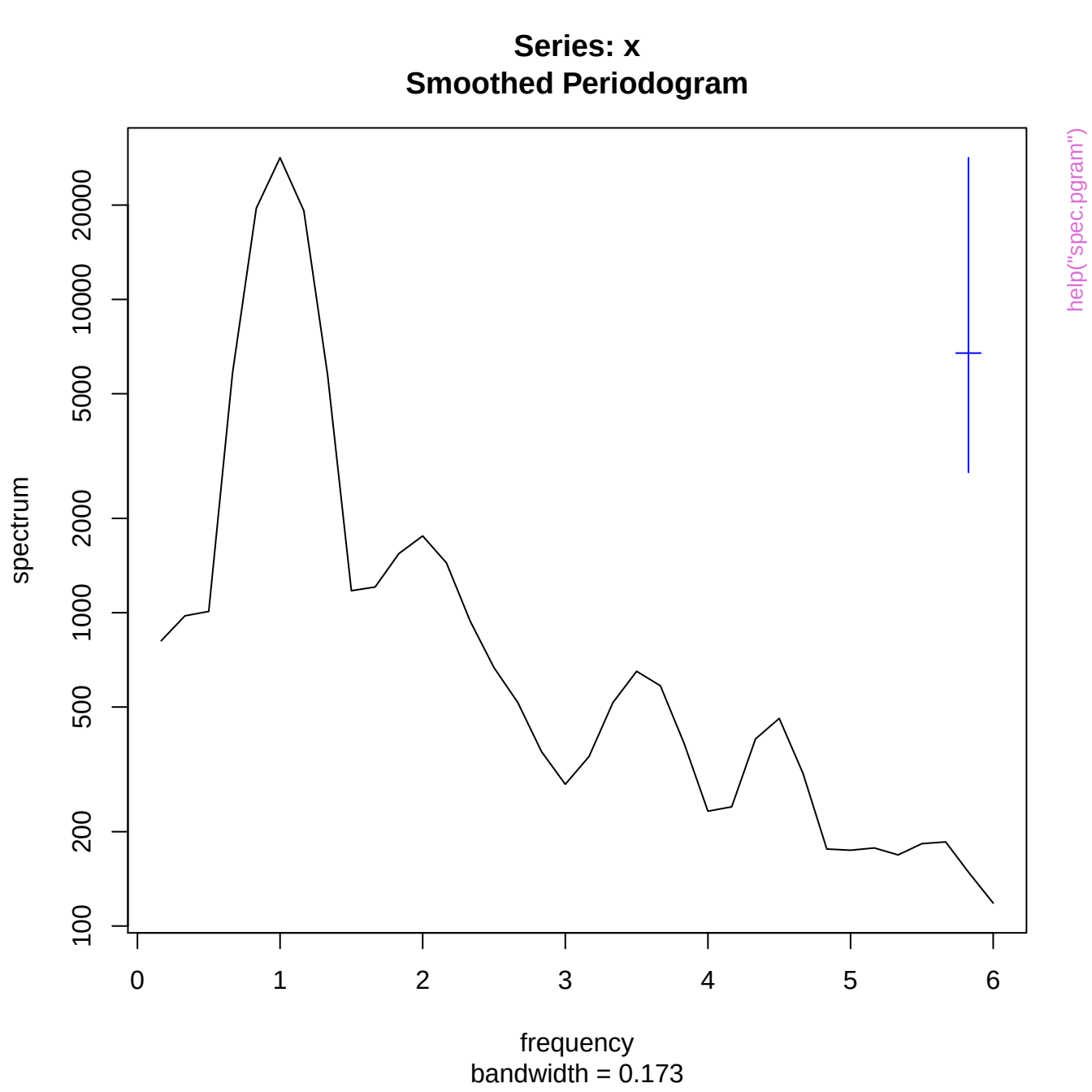

Series: log(lynx)
AR (11) spectrum
spectrum
5e+01
5e+00
5e−01
5e−02
0.0
0.1
0.2
0.3
0.4
0.5
frequency
help("spec.ar")

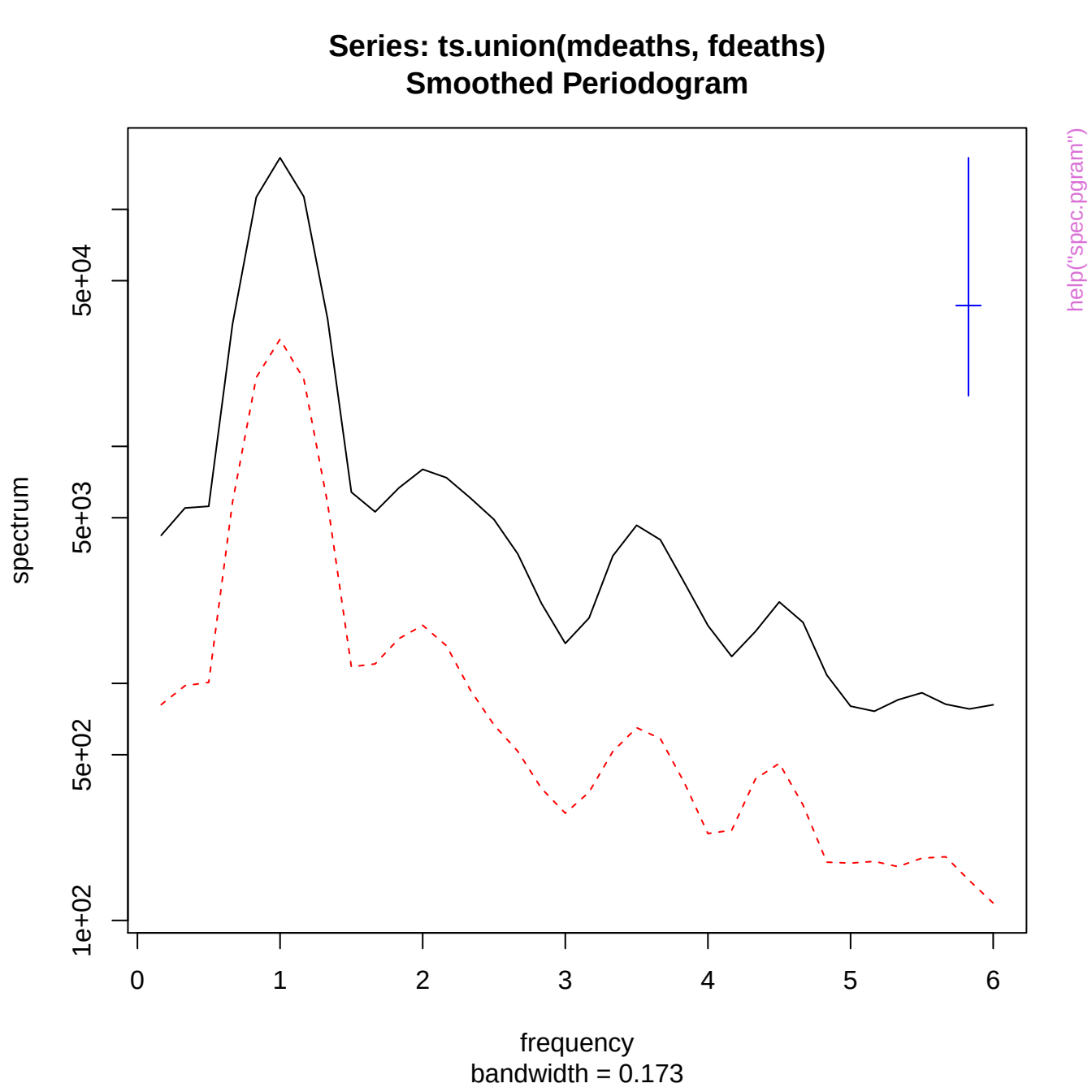

Series: x
Raw Periodogram
spectrum
5e+05
5e+04
5e+03
5e+02
0
1
2
3
4
5
6
frequency
bandwidth = 0.0481
help("spec.pgram")

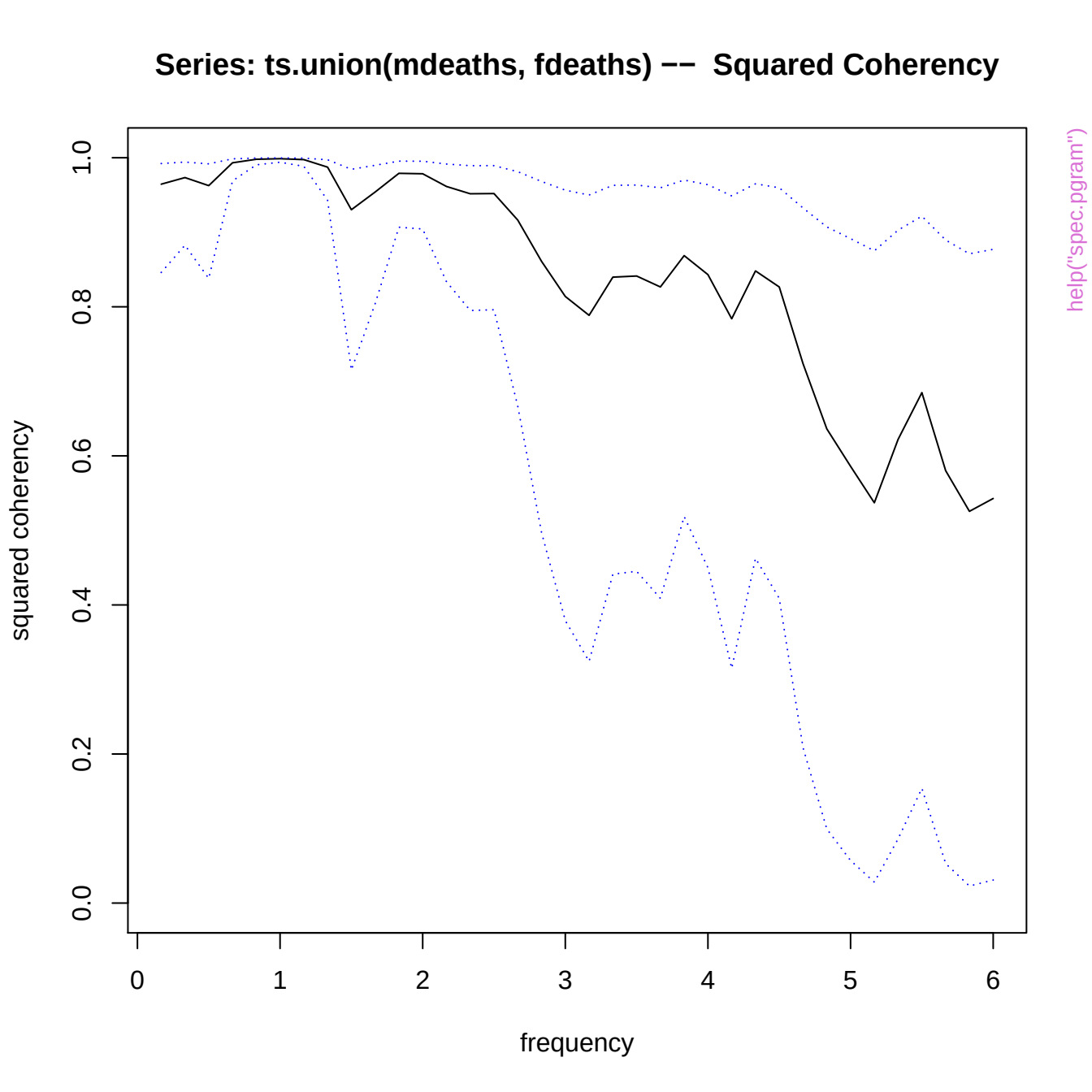

Series: x
Smoothed Periodogram
spectrum
2e+03
5e+03
1e+04
2e+04
5e+04
1e+05
2e+05
0
1
2
3
4
5
6
frequency
bandwidth = 0.241
help("spec.pgram")

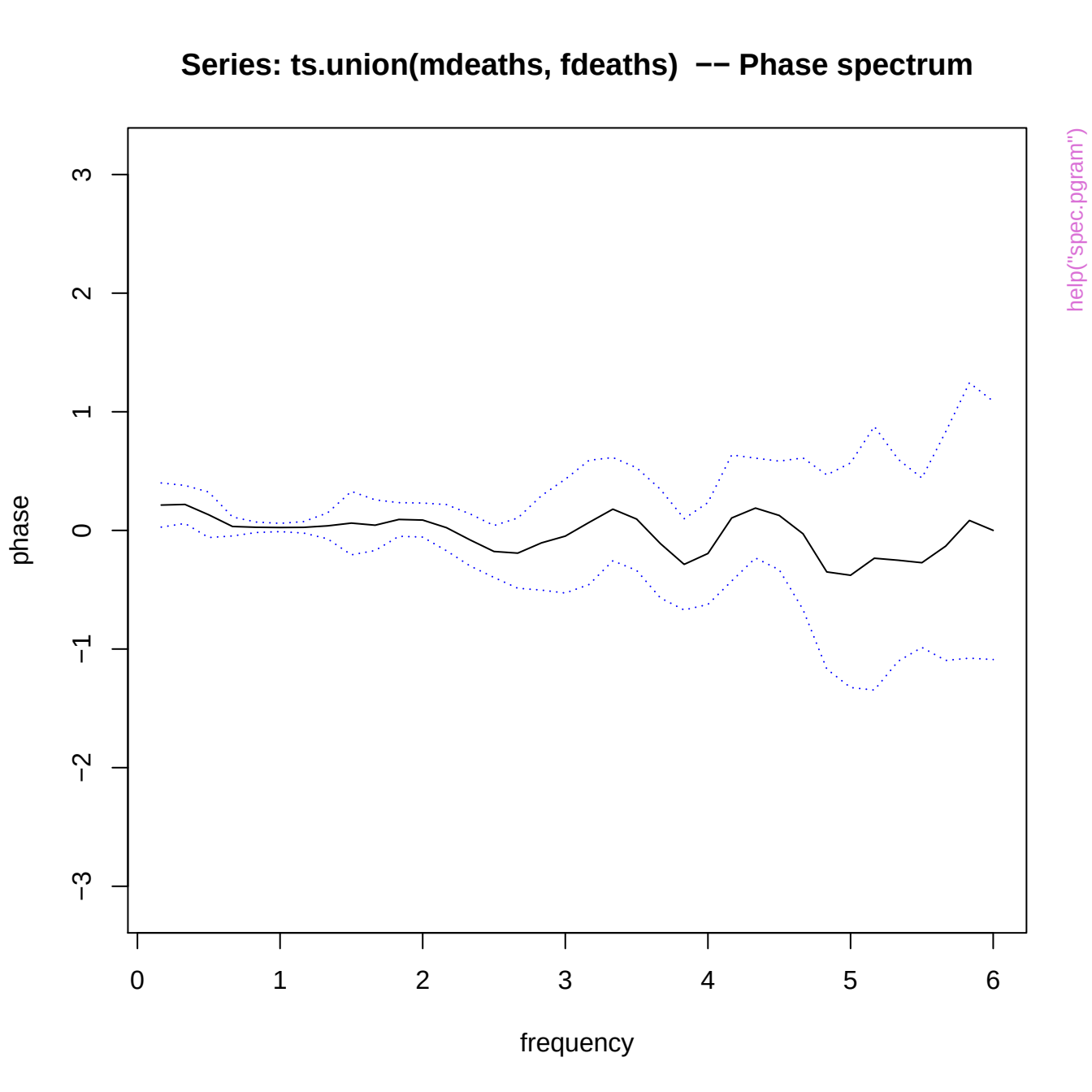

Series: x
Smoothed Periodogram
spectrum
2e+03
5e+03
1e+04
2e+04
5e+04
1e+05
0
1
2
3
4
5
6
frequency
bandwidth = 0.363
help("spec.pgram")

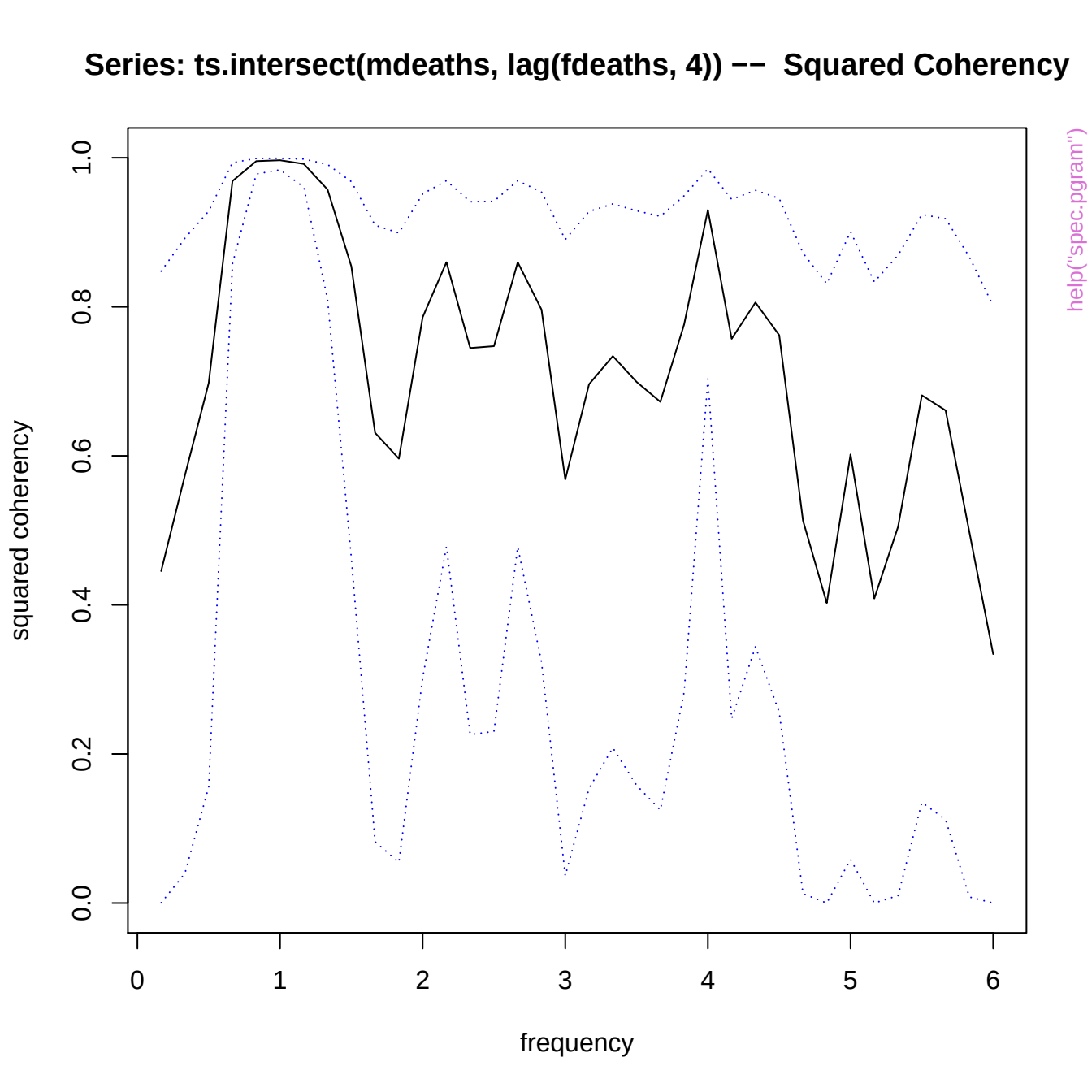

Series: x
Smoothed Periodogram
spectrum
2e+05
1e+05
5e+04
2e+04
1e+04
5e+03
2e+03
1e+03
0
1
2
3
4
5
6
frequency
bandwidth = 0.173
help("spec.pgram")

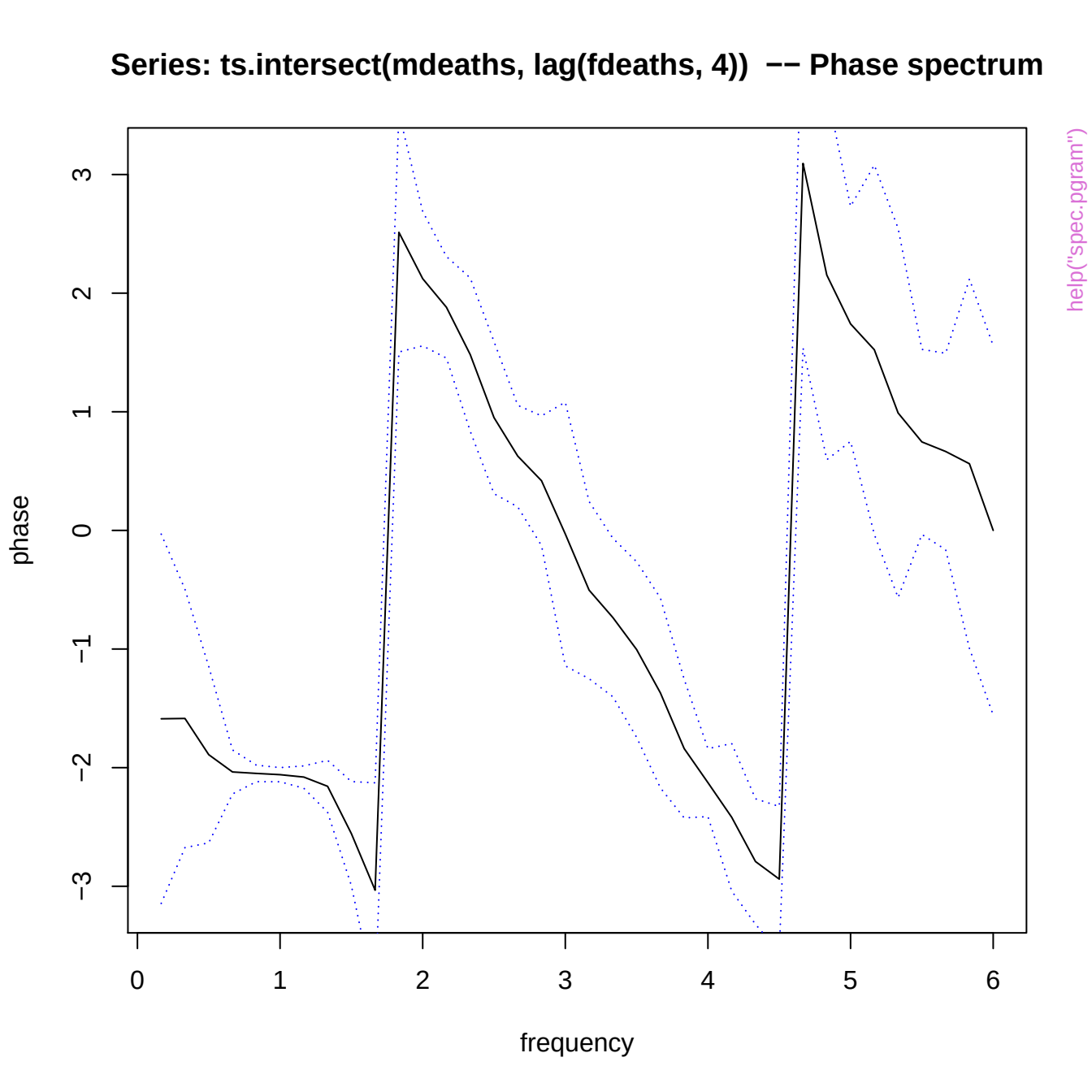

Series: x
Smoothed Periodogram
spectrum
100
200
500
1000
2000
5000
10000
20000
0
1
2
3
4
5
6
frequency
bandwidth = 0.173
help("spec.pgram")

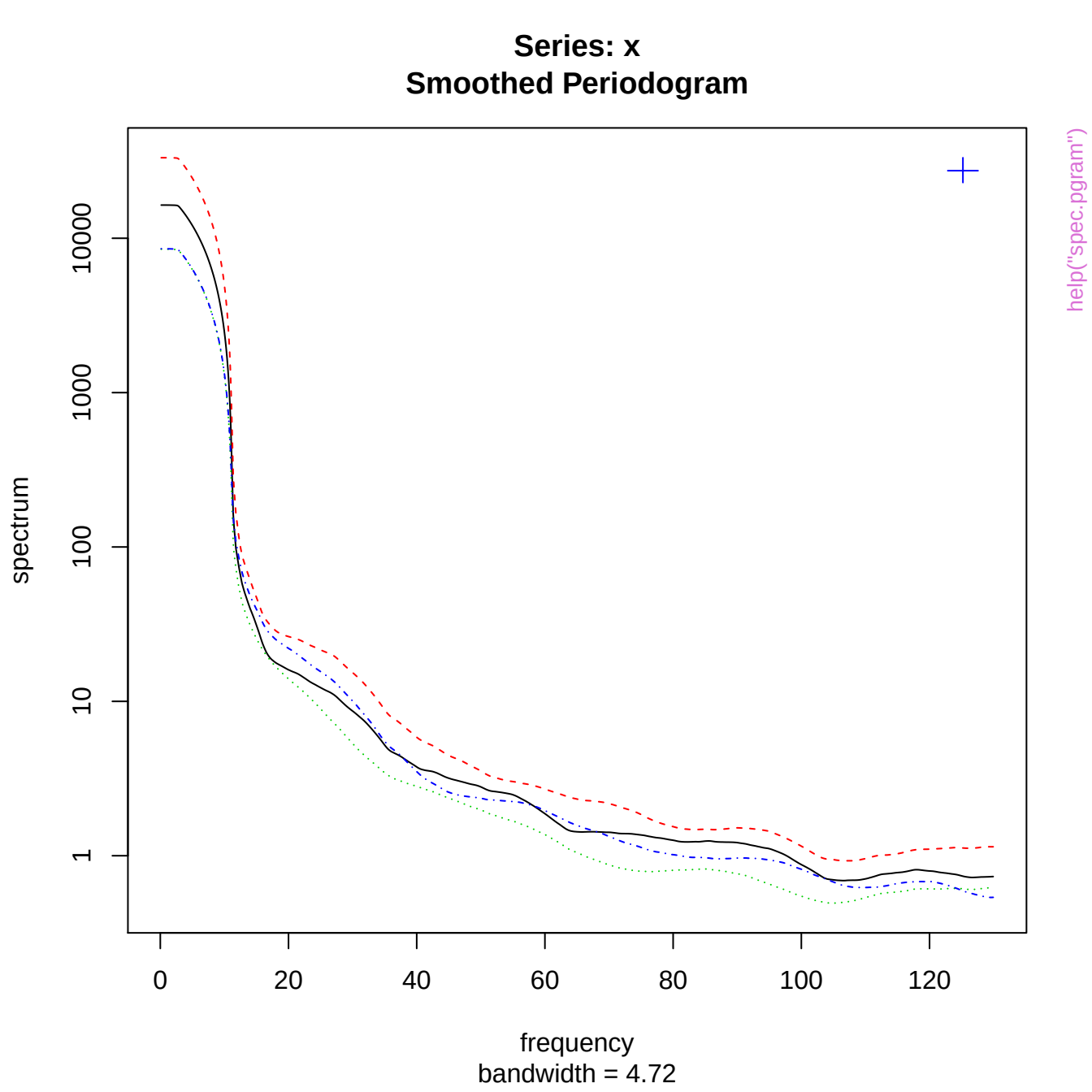

Series: ts.union(mdeaths, fdeaths)
Smoothed Periodogram
spectrum
1e+02
5e+02
5e+03
5e+04
0
1
2
3
4
5
6
frequency
bandwidth = 0.173
help("spec.pgram")

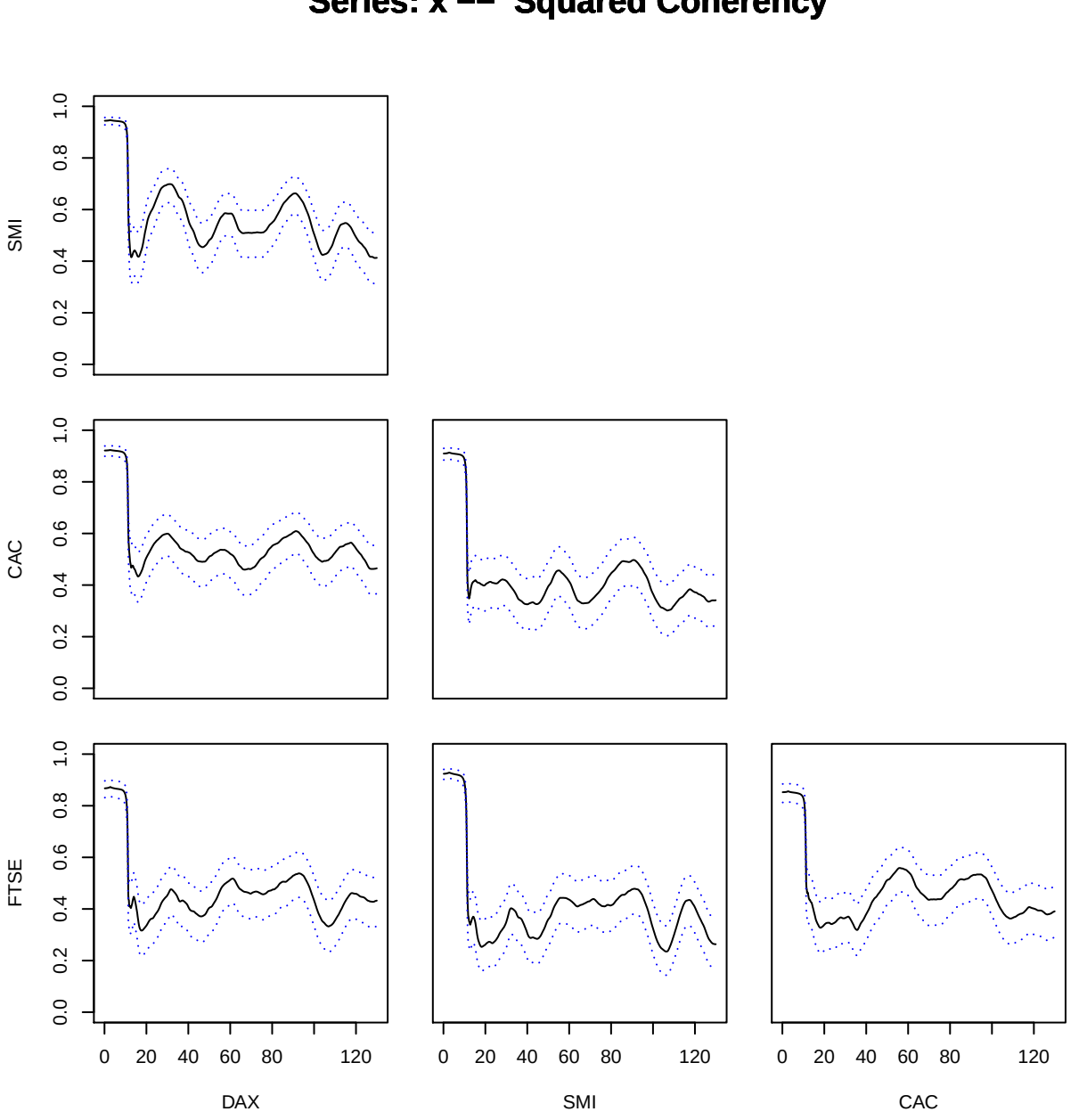

Series: ts.union(mdeaths, fdeaths) −− Squared Coherency
squared coherency
0.0
0.2
0.4
0.6
0.8
1.0
0
1
2
3
4
5
6
frequency
help("spec.pgram")

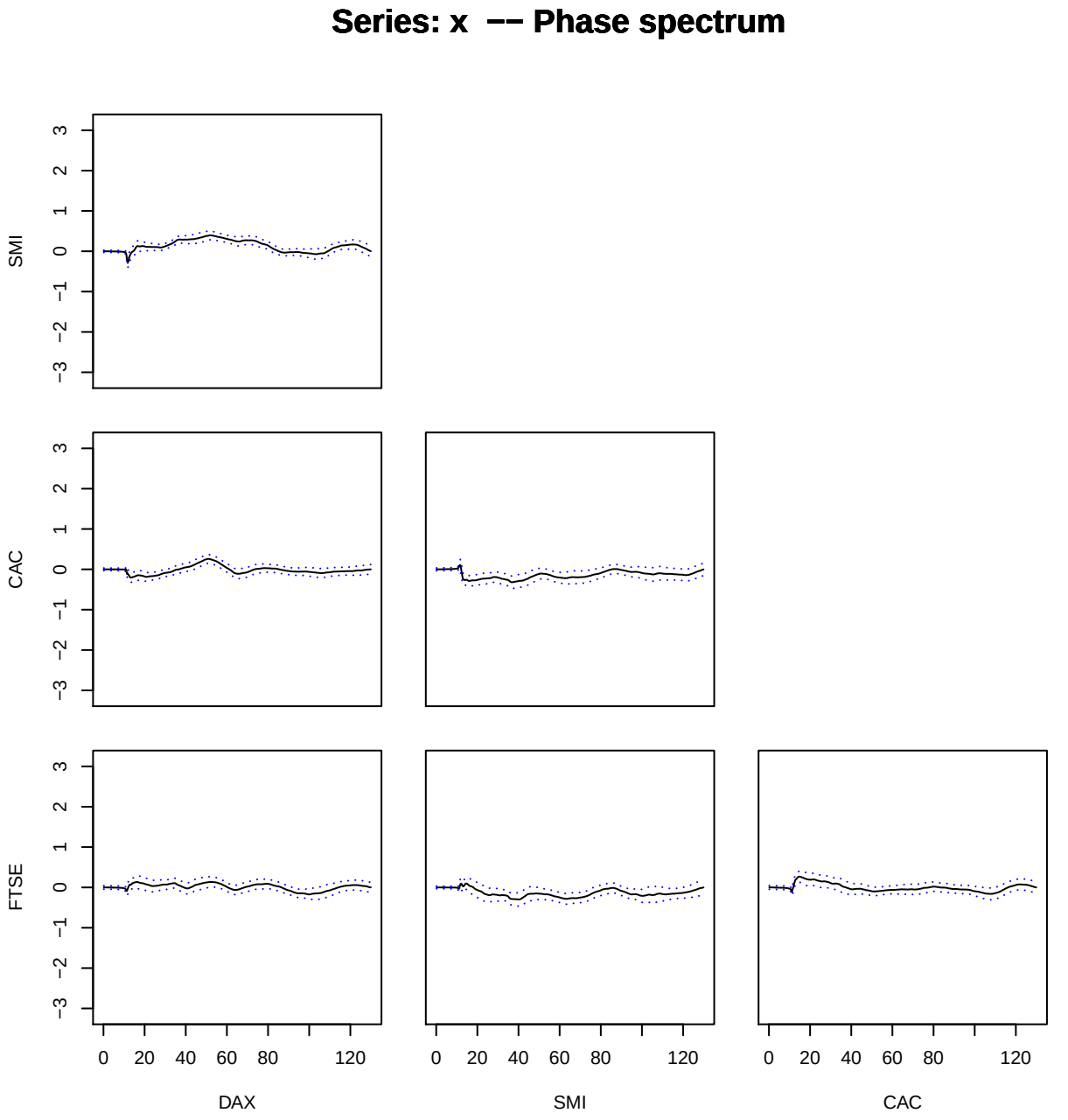

Series: ts.union(mdeaths, fdeaths) −− Phase spectrum
phase
3
2
1
0
−1
−2
−3
0
1
2
3
4
5
6
frequency
help("spec.pgram")

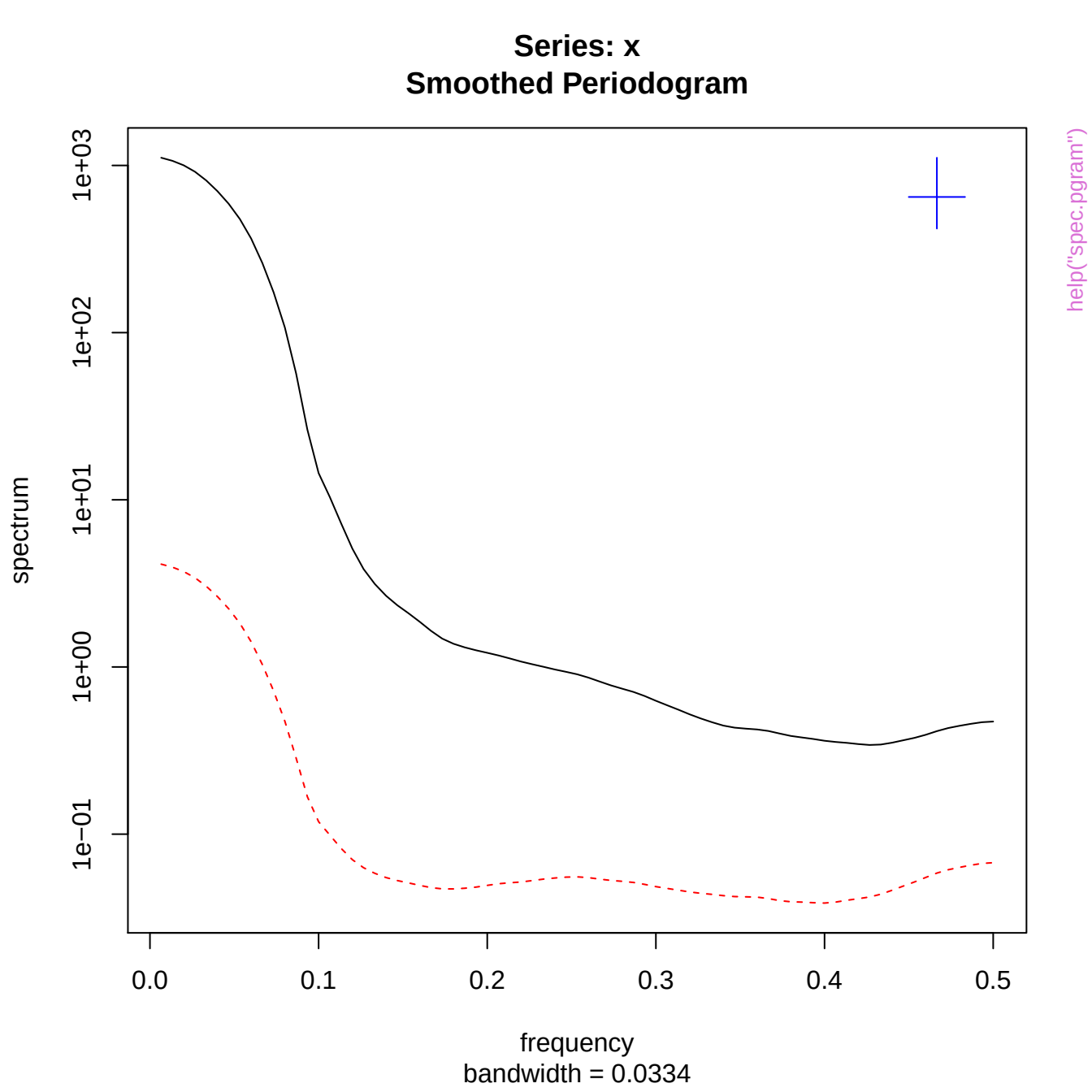

Series: ts.intersect(mdeaths, lag(fdeaths, 4)) −− Squared Coherency
squared coherency
0.0
0.2
0.4
0.6
0.8
1.0
0
1
2
3
4
5
6
frequency
help("spec.pgram")

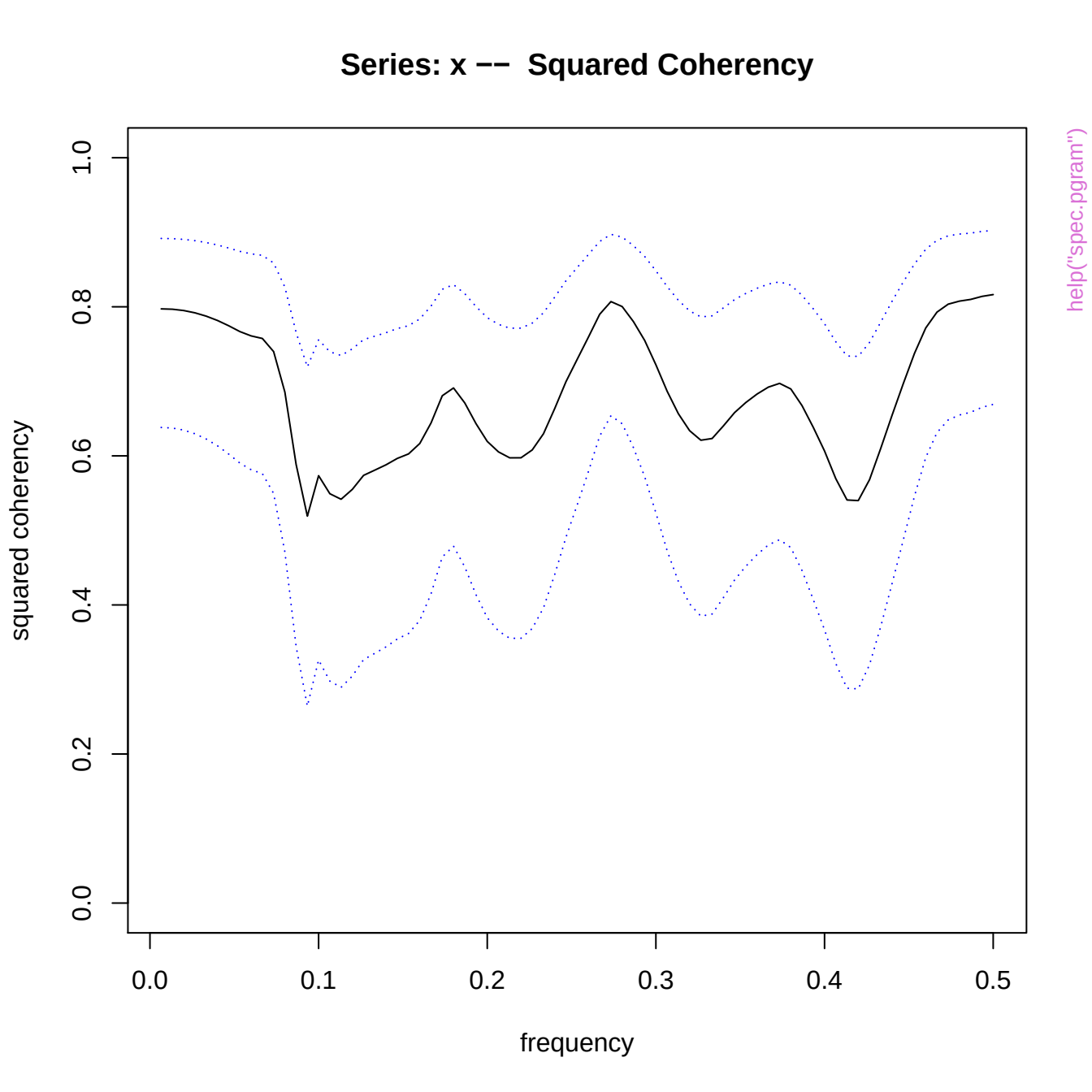

Series: ts.intersect(mdeaths, lag(fdeaths, 4)) −− Phase spectrum
phase
3
2
1
0
−1
−2
−3
0
1
2
3
4
5
6
frequency
help("spec.pgram")

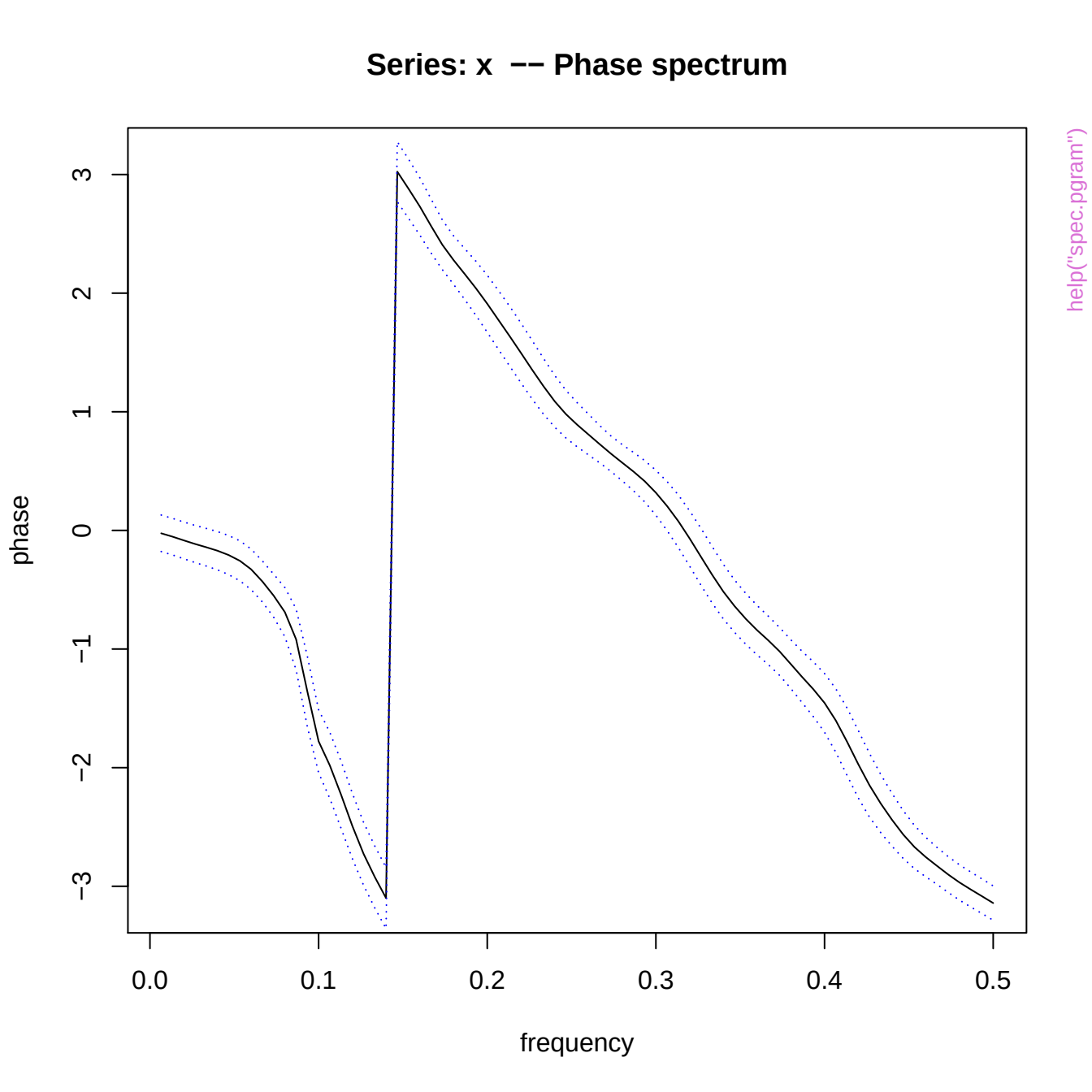

Series: x
Smoothed Periodogram
spectrum
10000
1000
100
10
1
0
20
40
60
80
100
120
frequency
bandwidth = 4.72
help("spec.pgram")

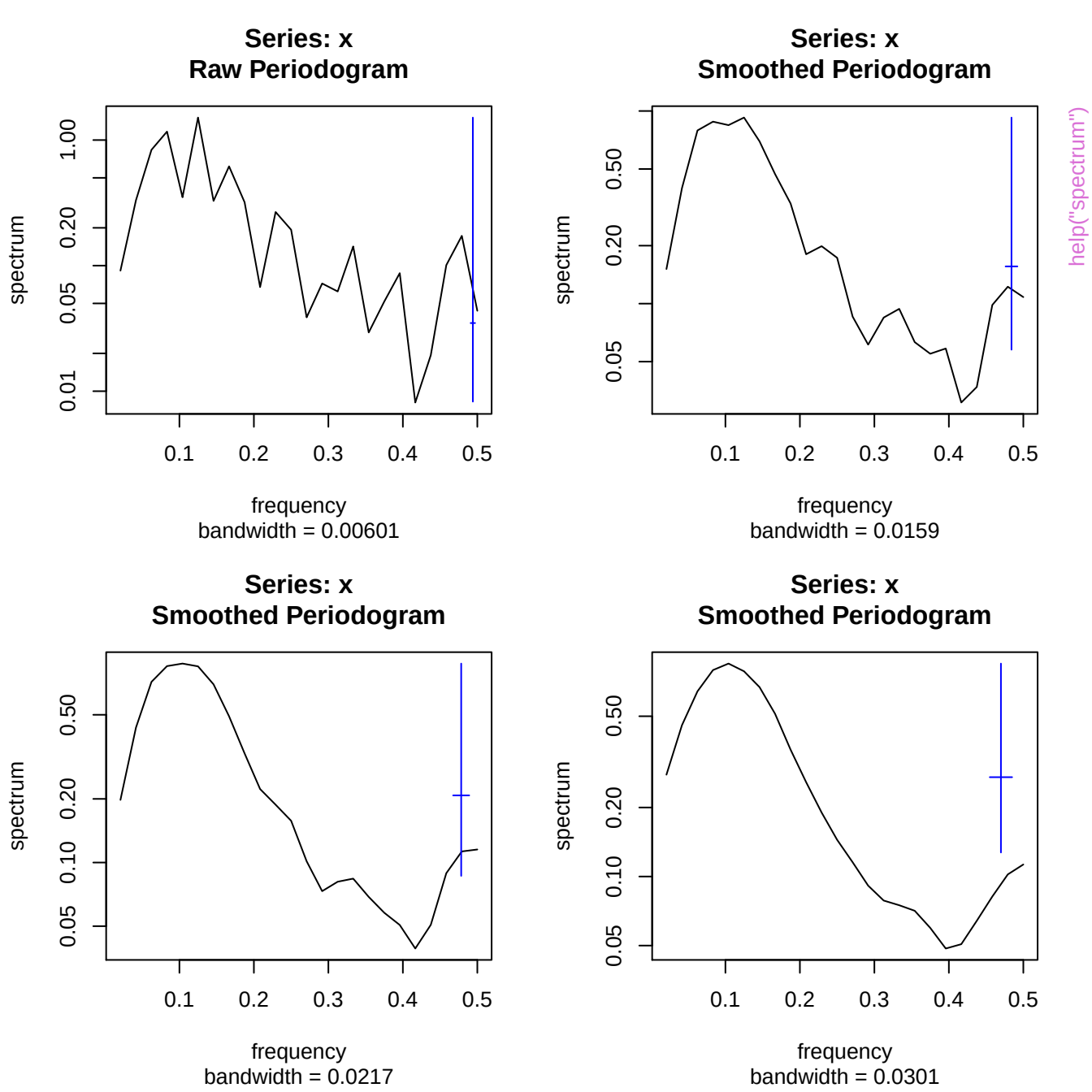

Series: x −− Squared Coherency
SMI
CAC
FTSE
0.0
0.2
0.4
0.6
0.8
1.0
0
20
40
60
80
120
DAX
SMI
CAC

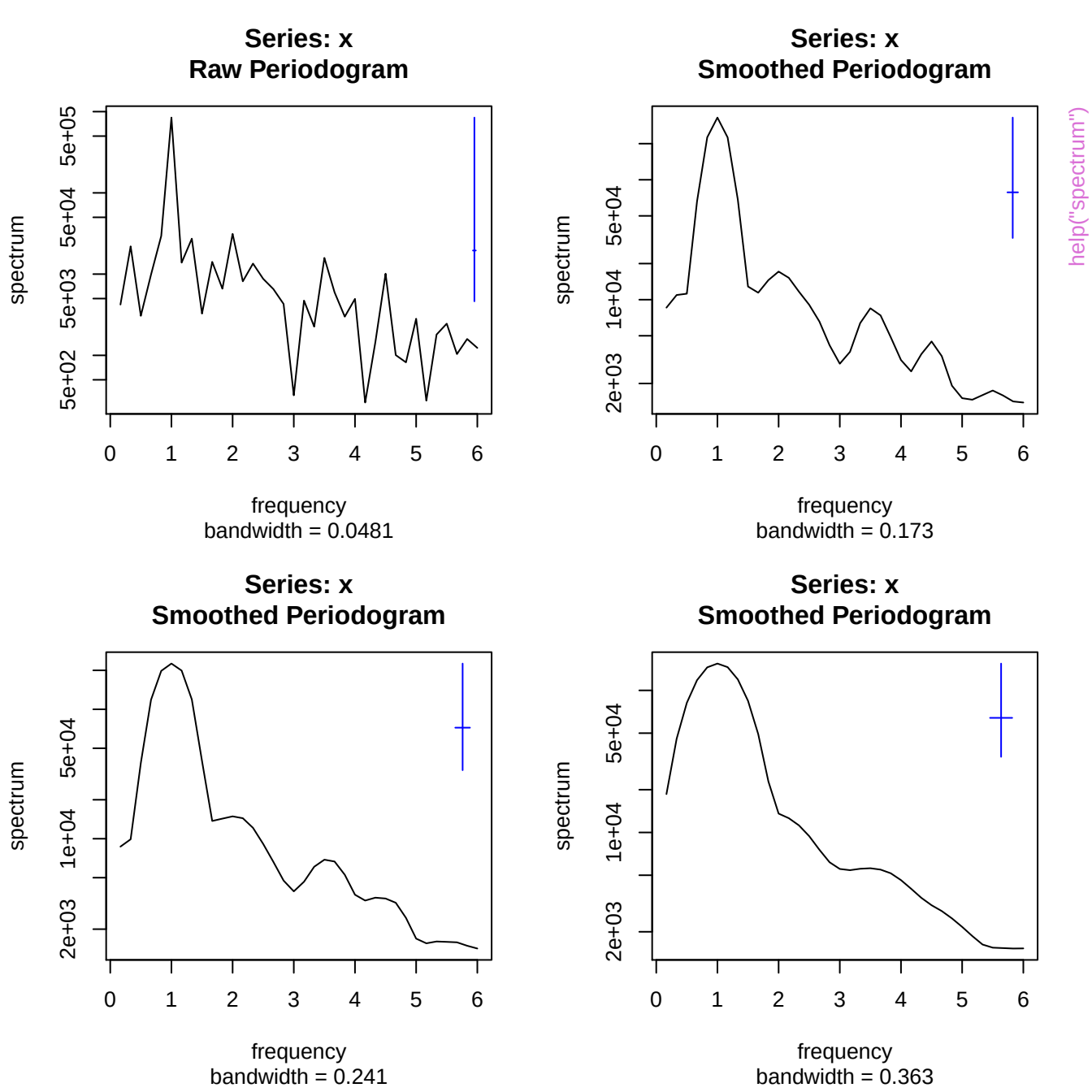

Series: x -- Phase spectrum
SMI
CAC
FTSE
DAX
SMI
CAC
0
20
40
60
80
120
−3
−2
−1
0
1
2
3

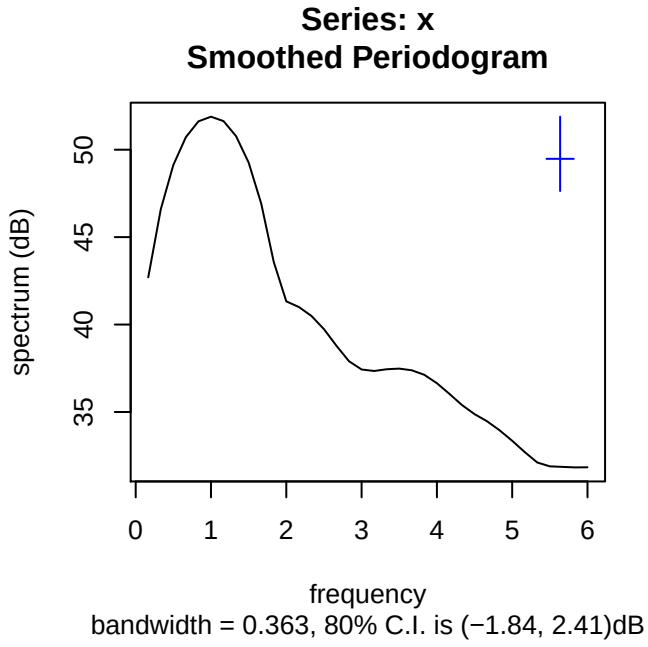

Series: x
Smoothed Periodogram
spectrum
1e+03
1e+02
1e+01
1e+00
1e−01
0.0
0.1
0.2
0.3
0.4
0.5
frequency
bandwidth = 0.0334
help("spec.pgram")

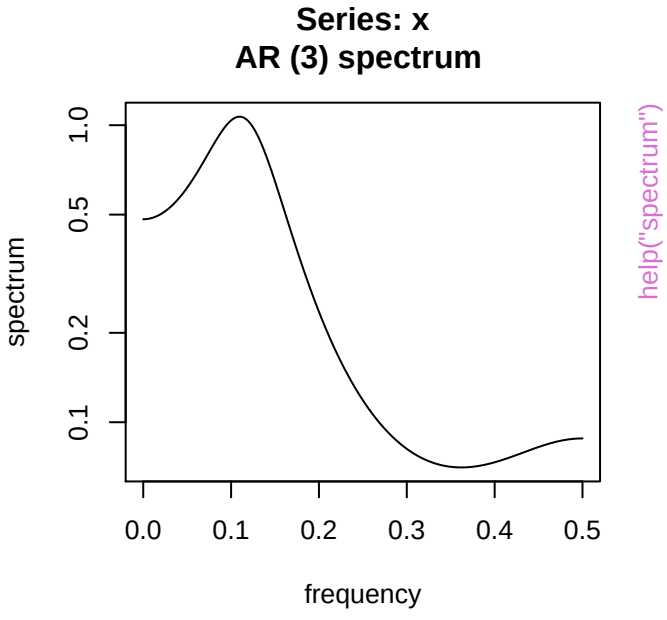

Series: x −− Squared Coherency
squared coherency
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.1
0.2
0.3
0.4
0.5
frequency
help("spec.pgram")

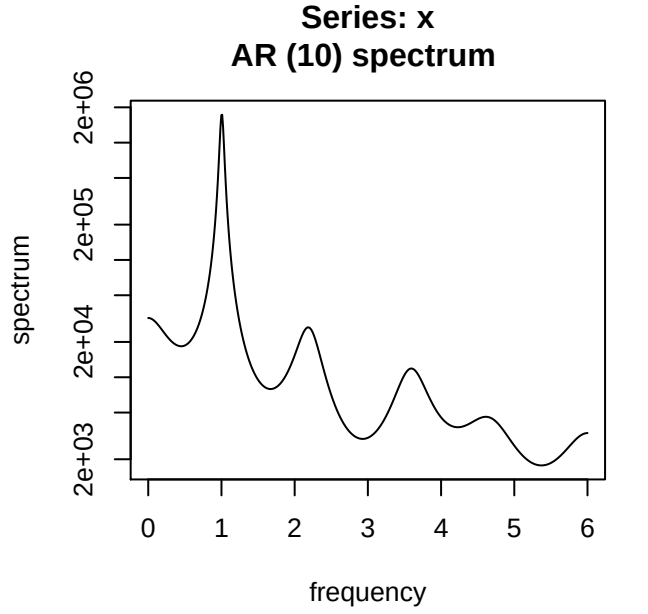

Series: x −− Phase spectrum
phase
3
2
1
0
−1
−2
−3
0.0
0.1
0.2
0.3
0.4
0.5
frequency
help("spec.pgram")

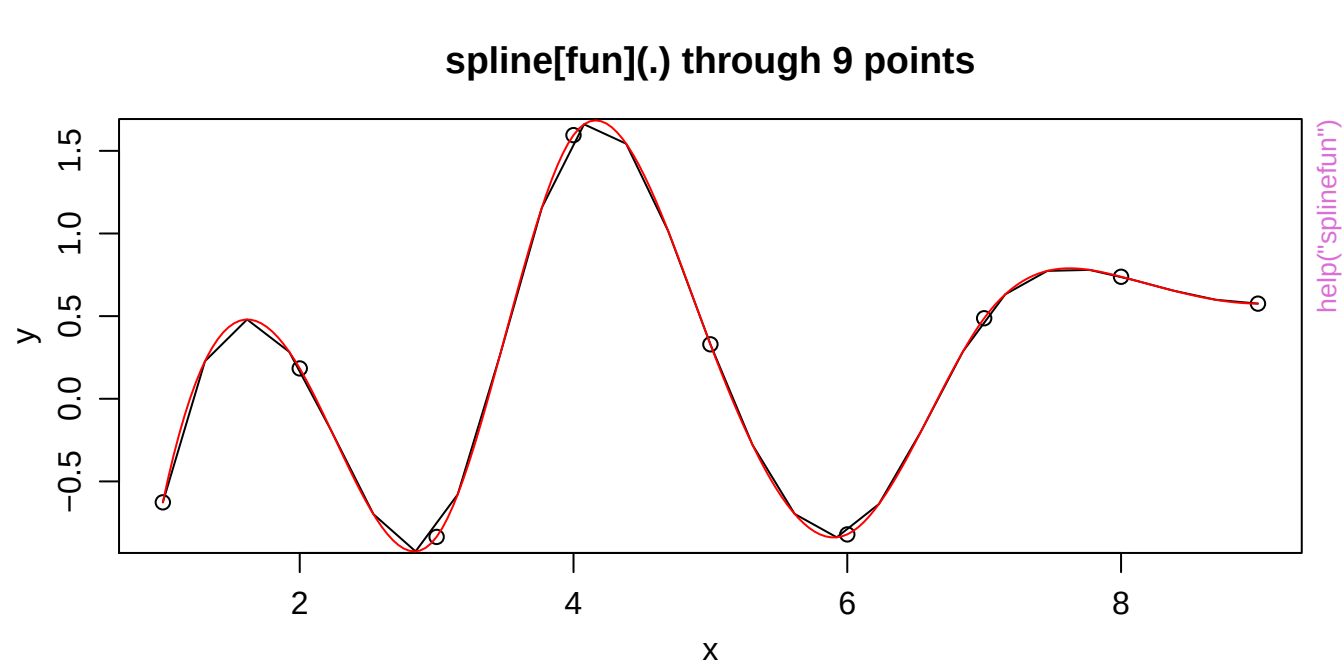

Series: x
Raw Periodogram
spectrum
1.00
0.20
0.05
0.01
0.1
0.2
0.3
0.4
0.5
frequency
bandwidth = 0.00601
Series: x
Smoothed Periodogram
spectrum
0.50
0.20
0.05
0.1
0.2
0.3
0.4
0.5
frequency
bandwidth = 0.0159
help("spectrum")
Series: x
Smoothed Periodogram
spectrum
0.50
0.20
0.10
0.05
0.1
0.2
0.3
0.4
0.5
frequency
bandwidth = 0.0217
Series: x
Smoothed Periodogram
spectrum
0.50
0.20
0.10
0.05
0.1
0.2
0.3
0.4
0.5
frequency
bandwidth = 0.0301

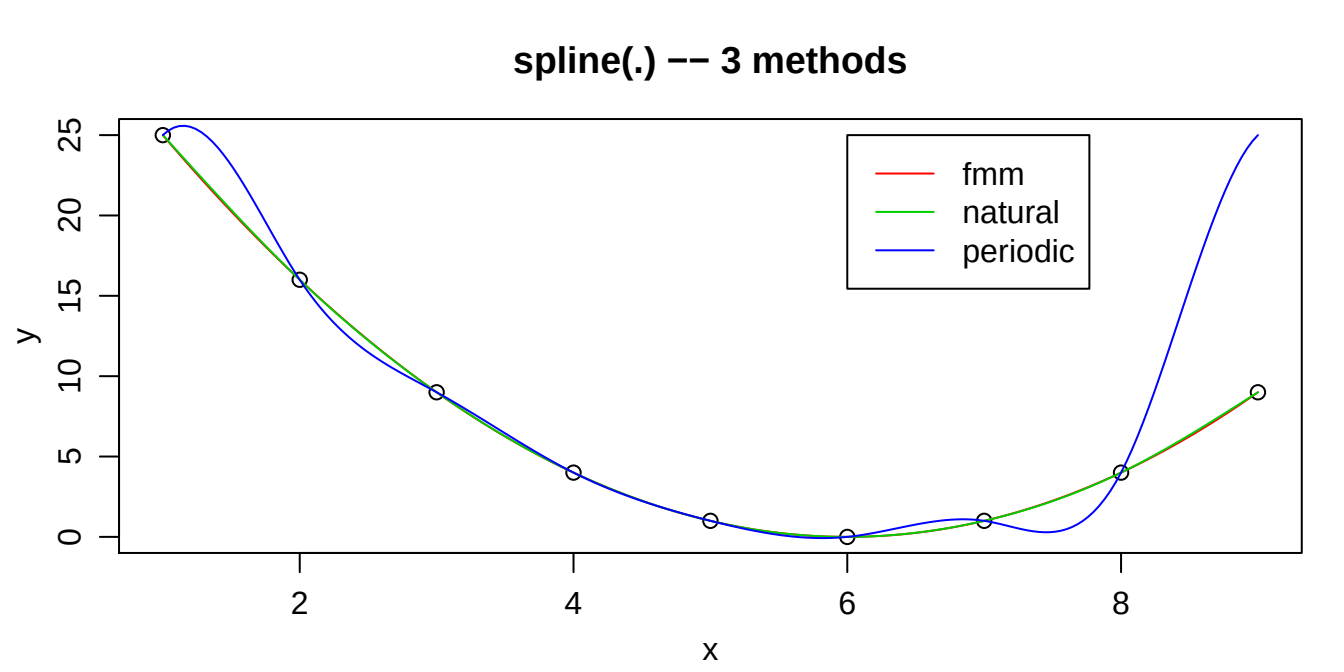

Series: x
Raw Periodogram
spectrum
5e+02
5e+03
5e+04
5e+05
0
1
2
3
4
5
6
frequency
bandwidth = 0.0481
Series: x
Smoothed Periodogram
spectrum
2e+03
1e+04
5e+04
0
1
2
3
4
5
6
frequency
bandwidth = 0.173
help("spectrum")
Series: x
Smoothed Periodogram
spectrum
2e+03
1e+04
5e+04
0
1
2
3
4
5
6
frequency
bandwidth = 0.241
Series: x
Smoothed Periodogram
spectrum
2e+03
1e+04
5e+04
0
1
2
3
4
5
6
frequency
bandwidth = 0.363

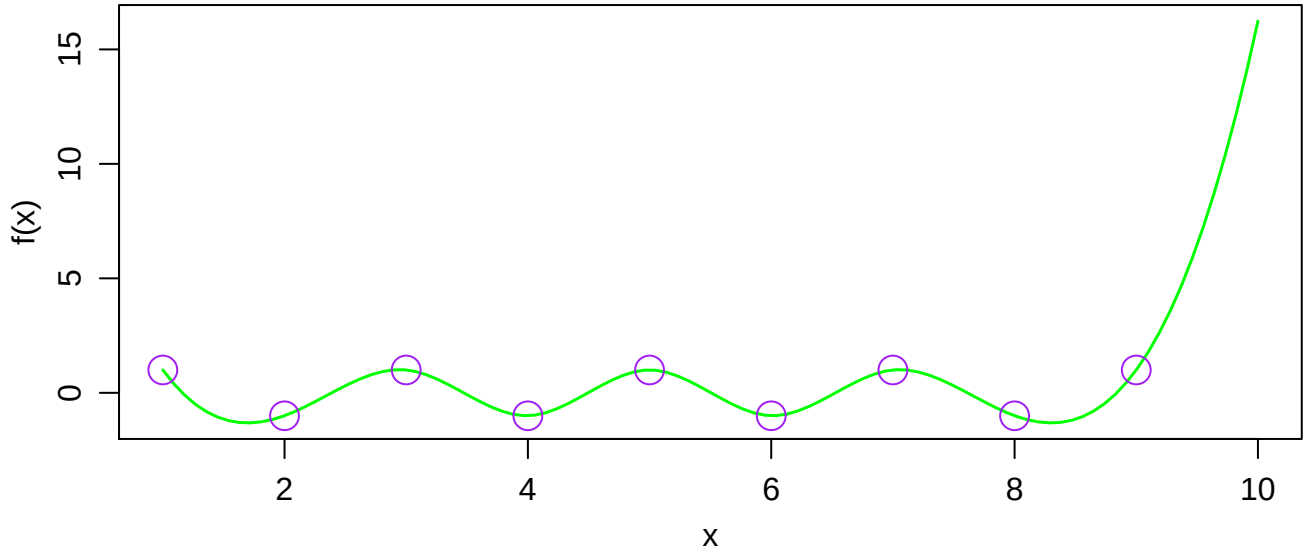

Series: x
Smoothed Periodogram
spectrum (dB)
35
40
45
50
0
1
2
3
4
5
6
frequency
bandwidth = 0.363, 80% C.I. is (−1.84, 2.41)dB


Series: x
AR (3) spectrum
spectrum
0.1
0.2
0.5
1.0
0.0
0.1
0.2
0.3
0.4
0.5
frequency
help("spectrum")

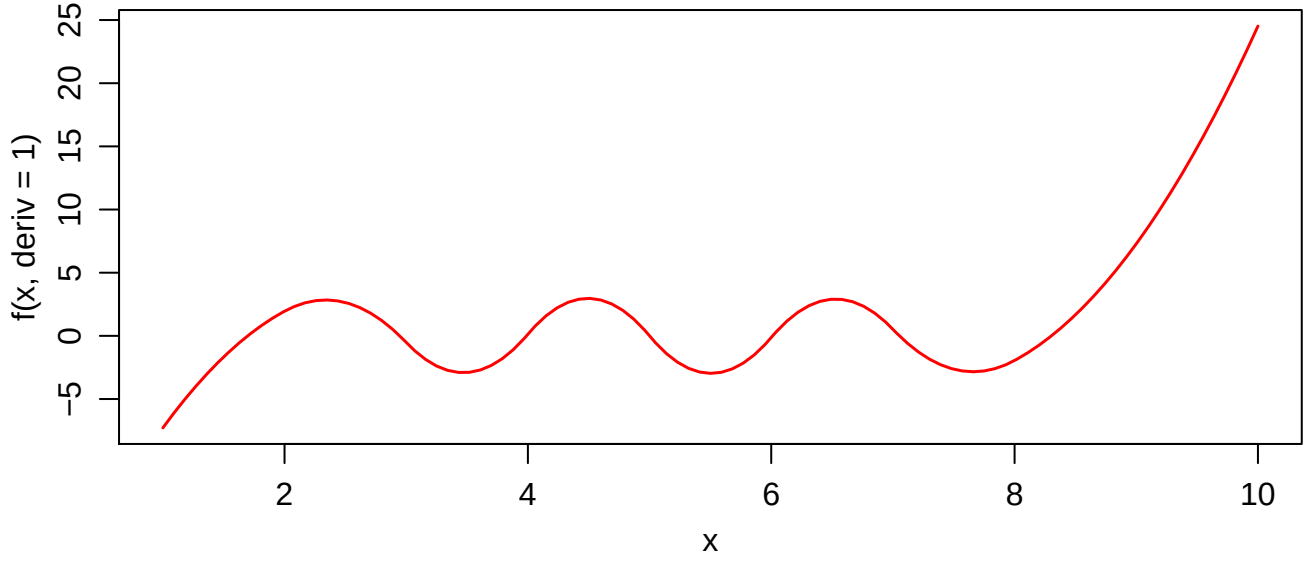

Series: x
AR (10) spectrum
spectrum
2e+03
2e+04
2e+05
2e+06
0
1
2
3
4
5
6
frequency

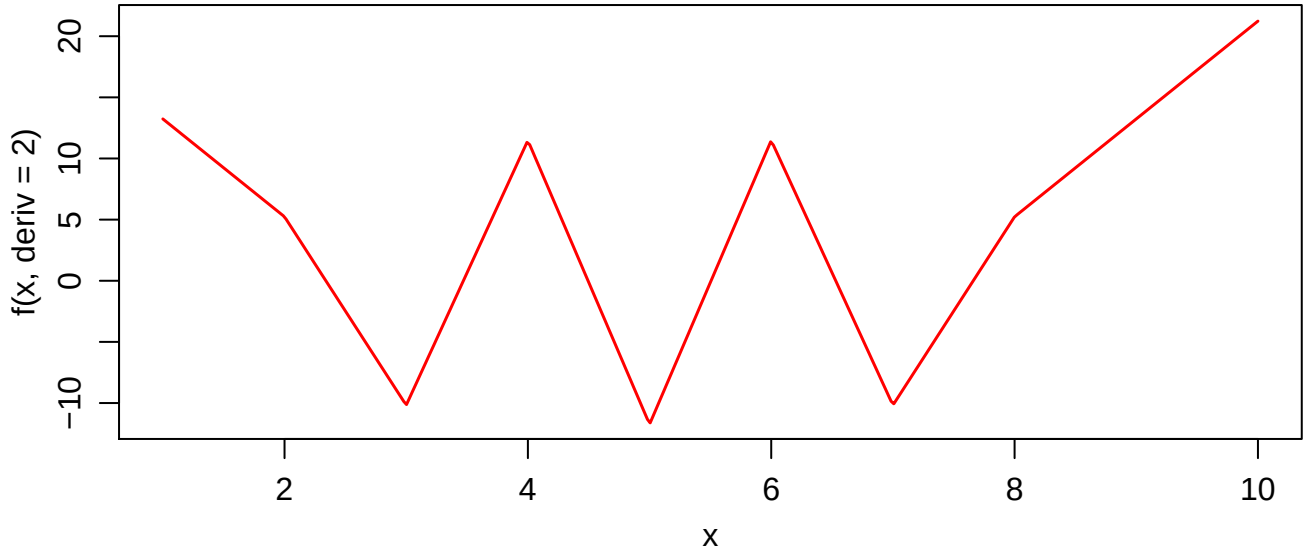

spline[fun](.) through 9 points
y
x
help("splinefun")


spline(.) -- 3 methods
fmm
natural
periodic
y
x

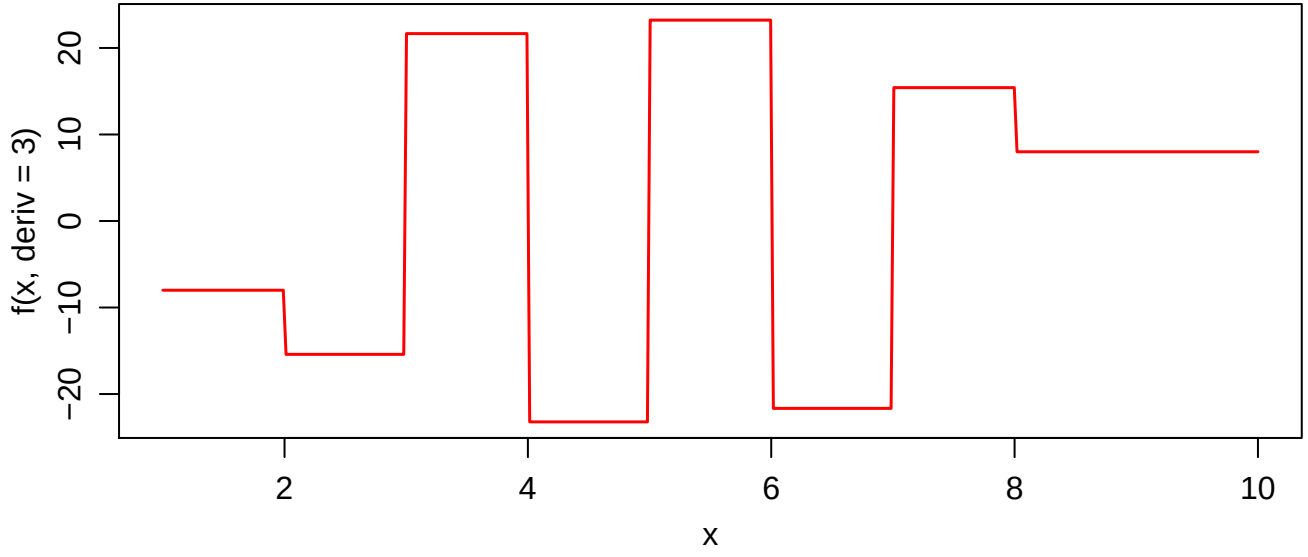


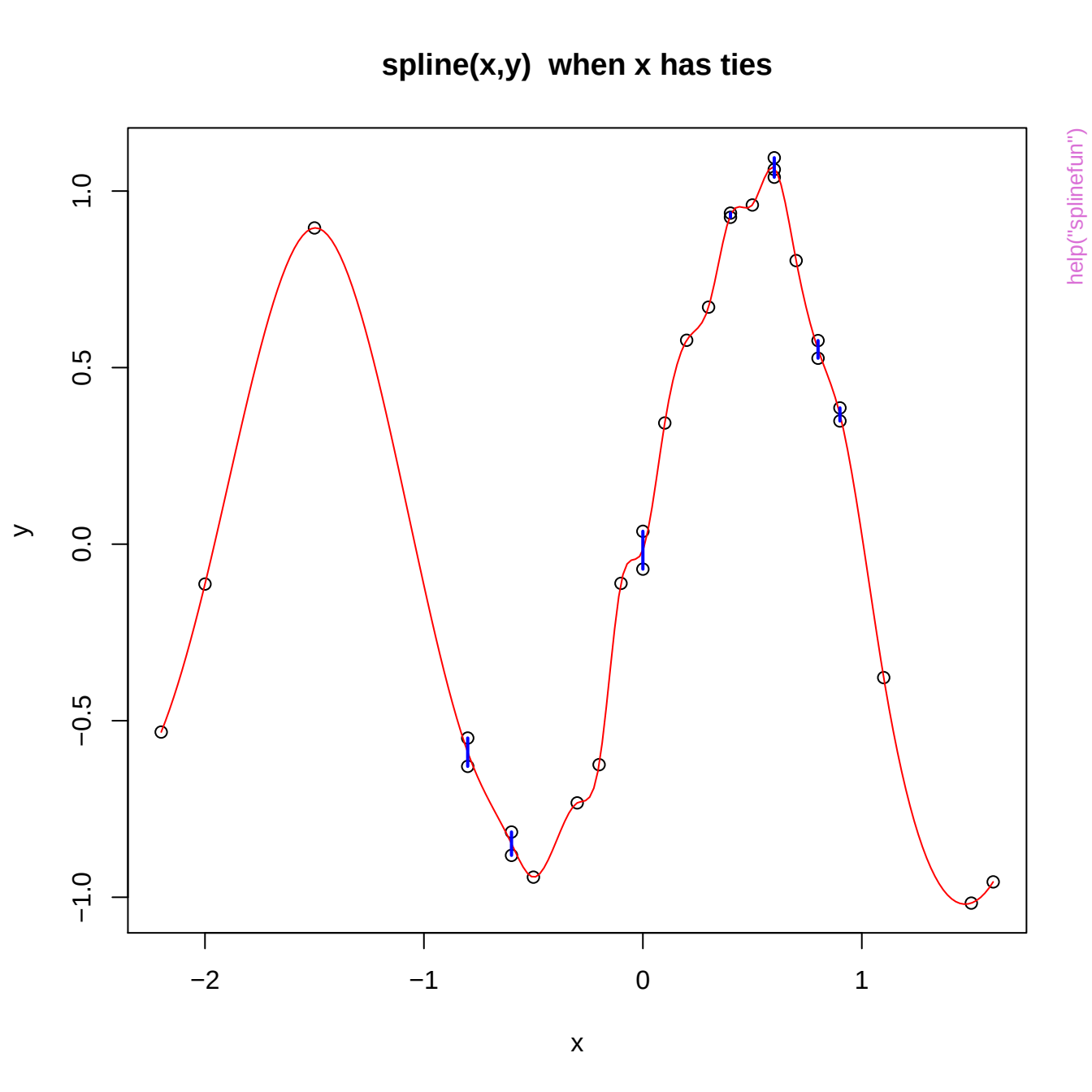
help("splinefun")

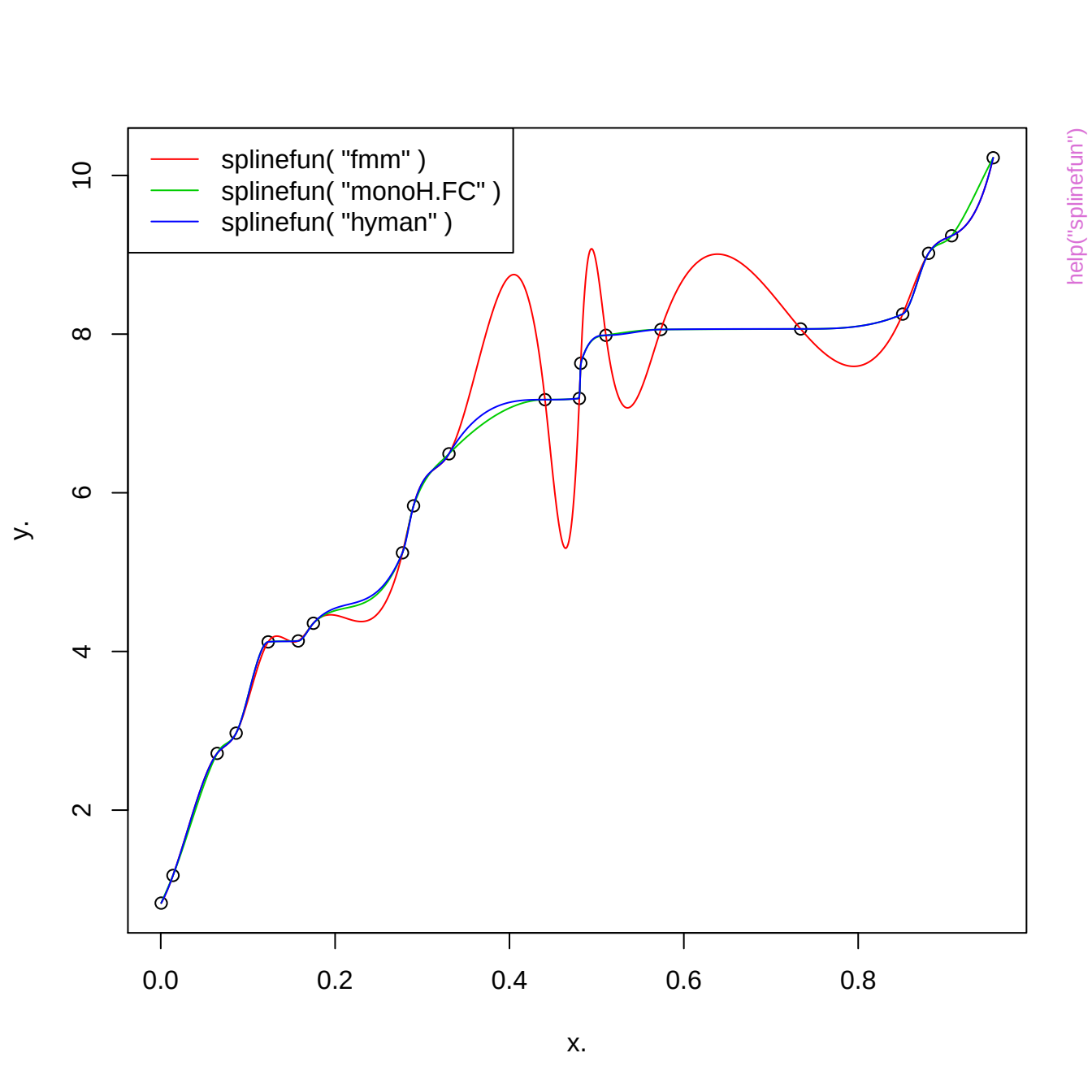


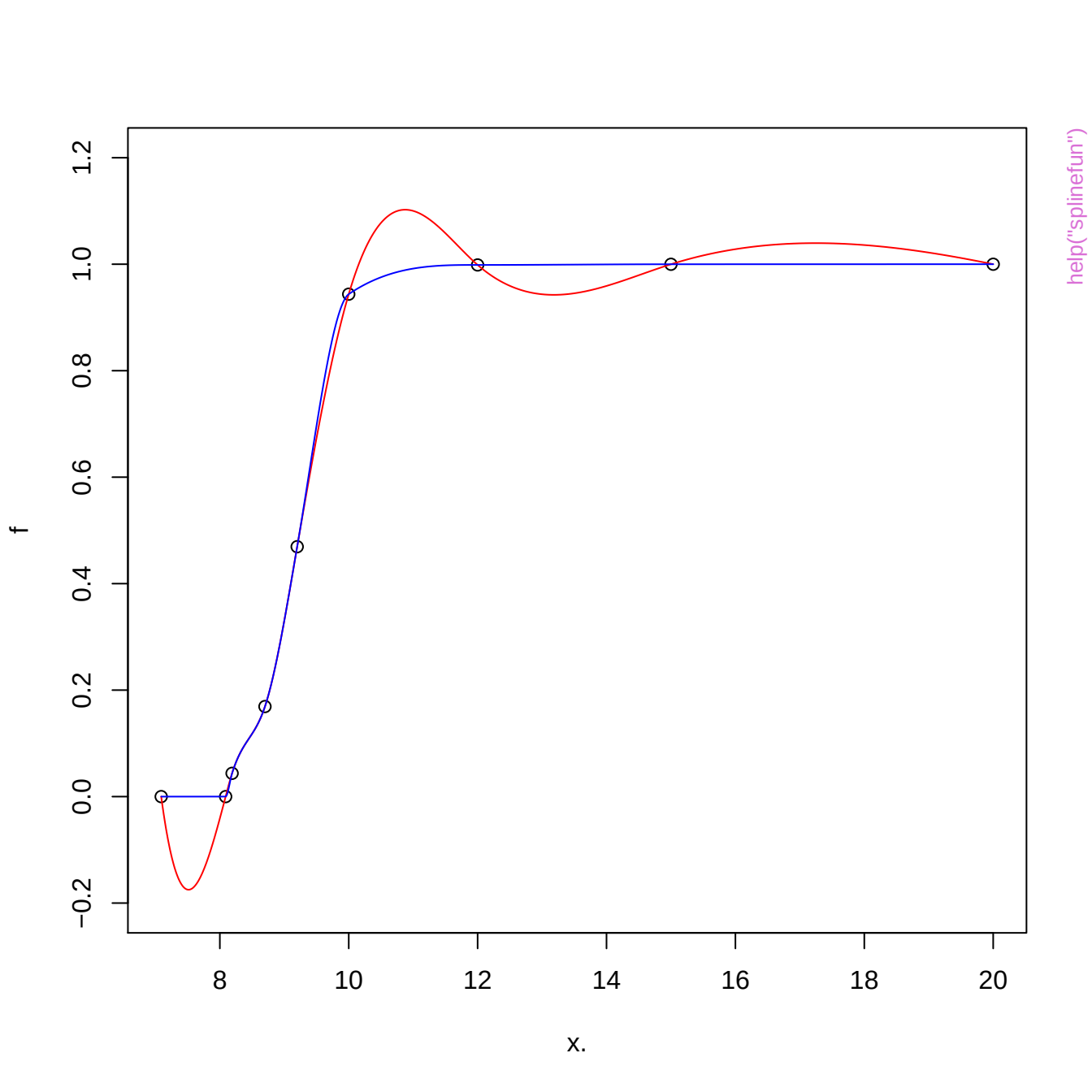


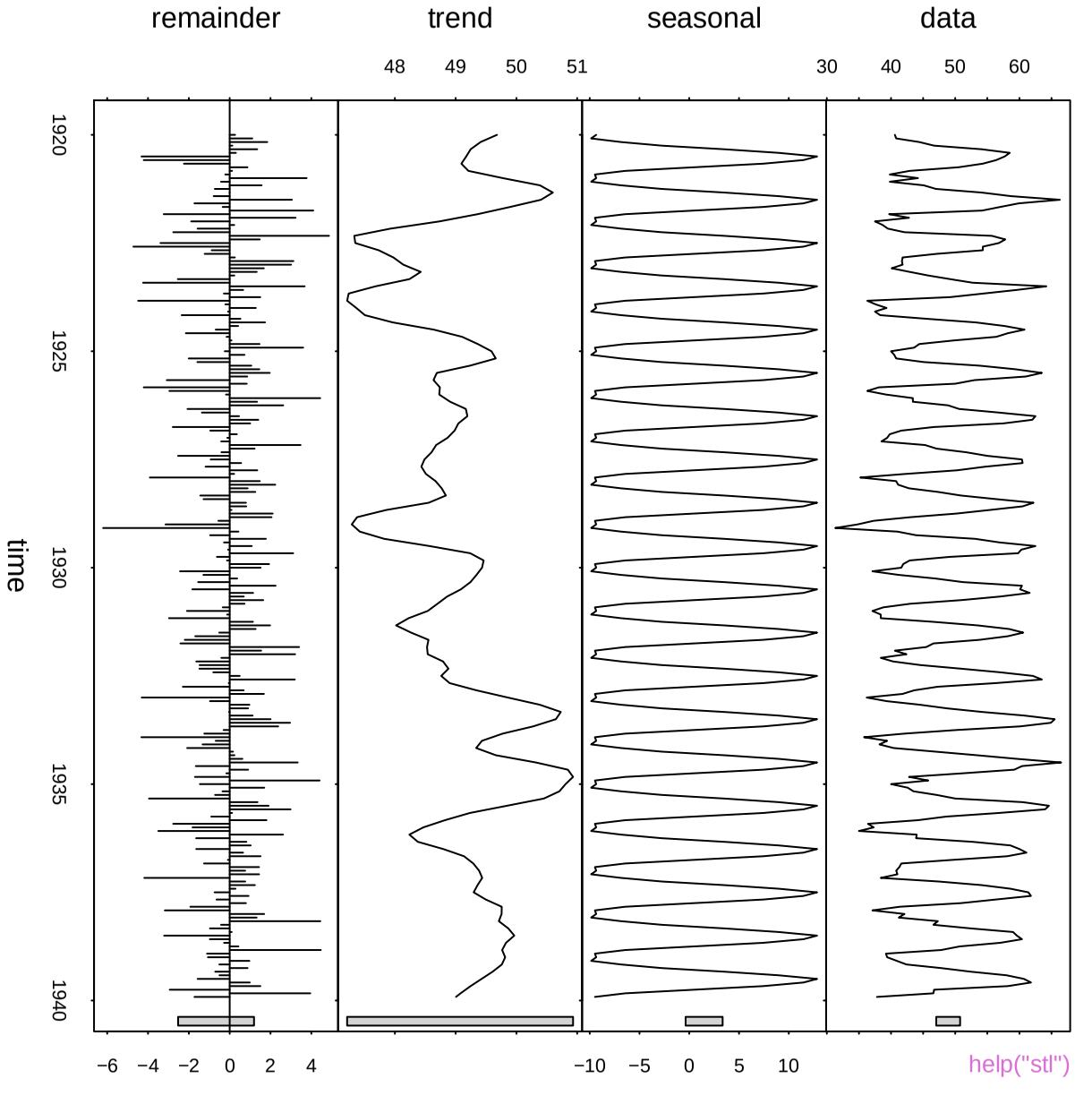
help("splinefun")

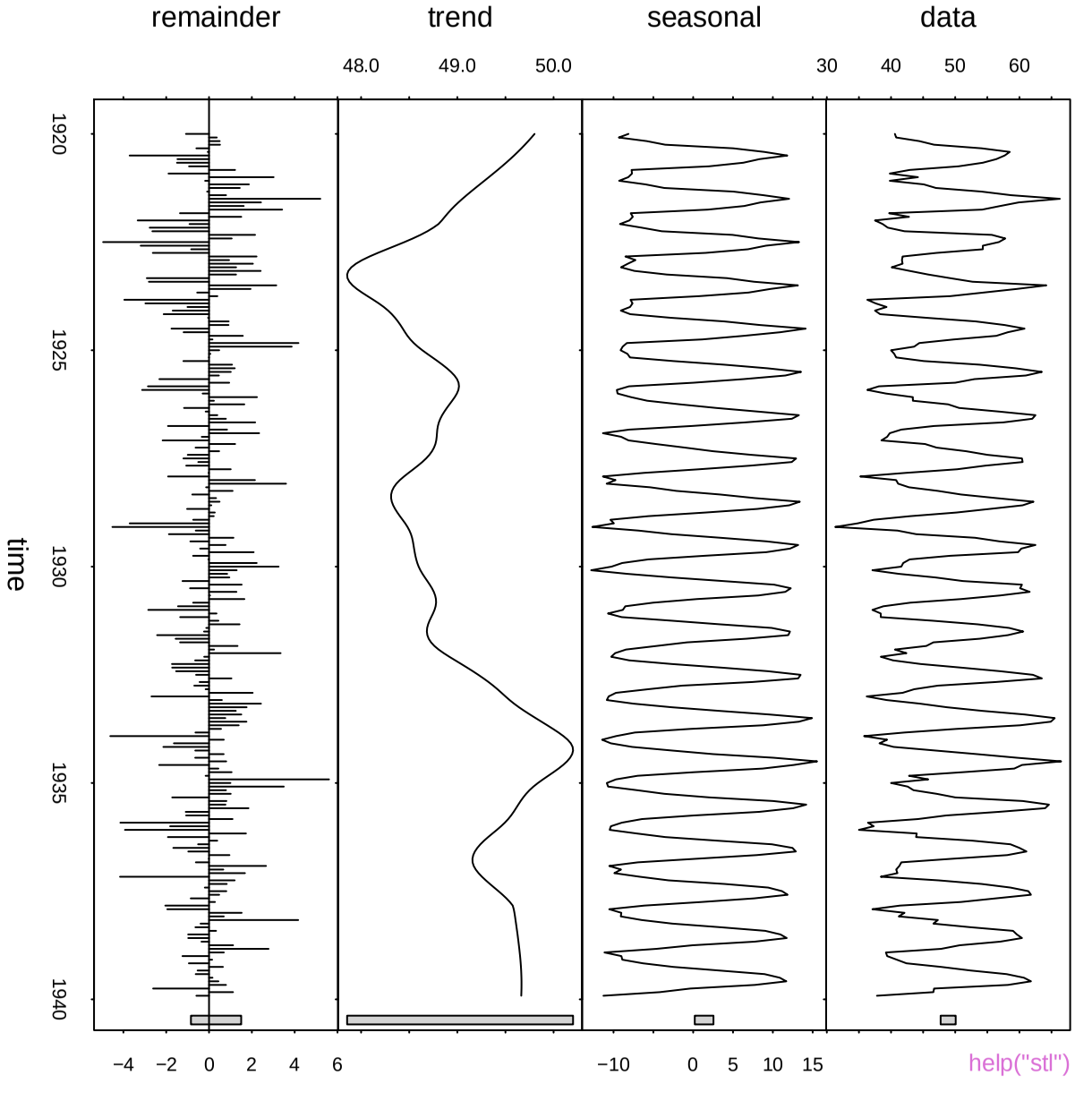


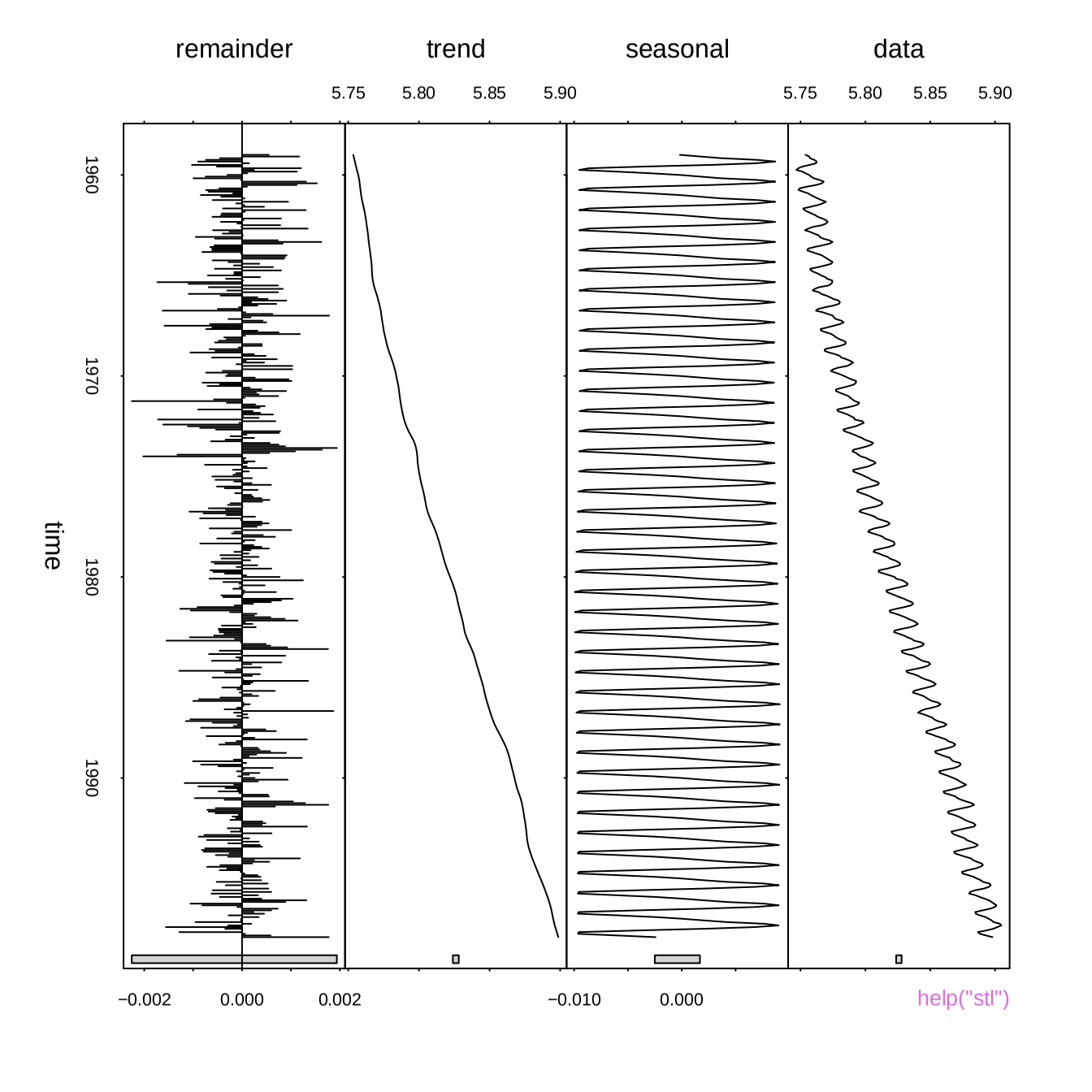

spline(x,y) when x has ties
y
x
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
help("splinefun")

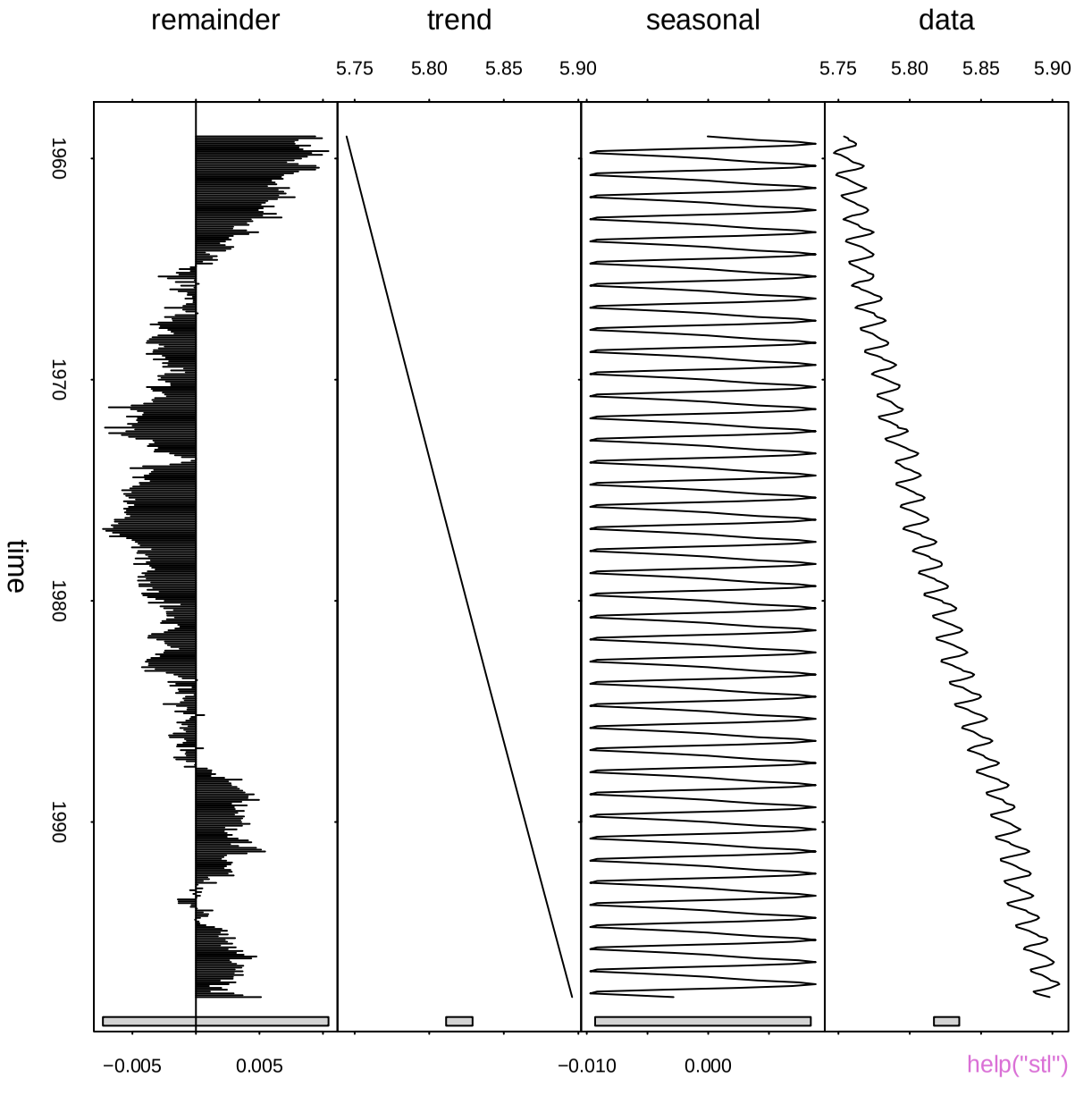

splinefun("fmm")
splinefun("monoH.FC")
splinefun("hyman")
y.
x.
2
4
6
8
10
0.0
0.2
0.4
0.6
0.8
help("splinefun")

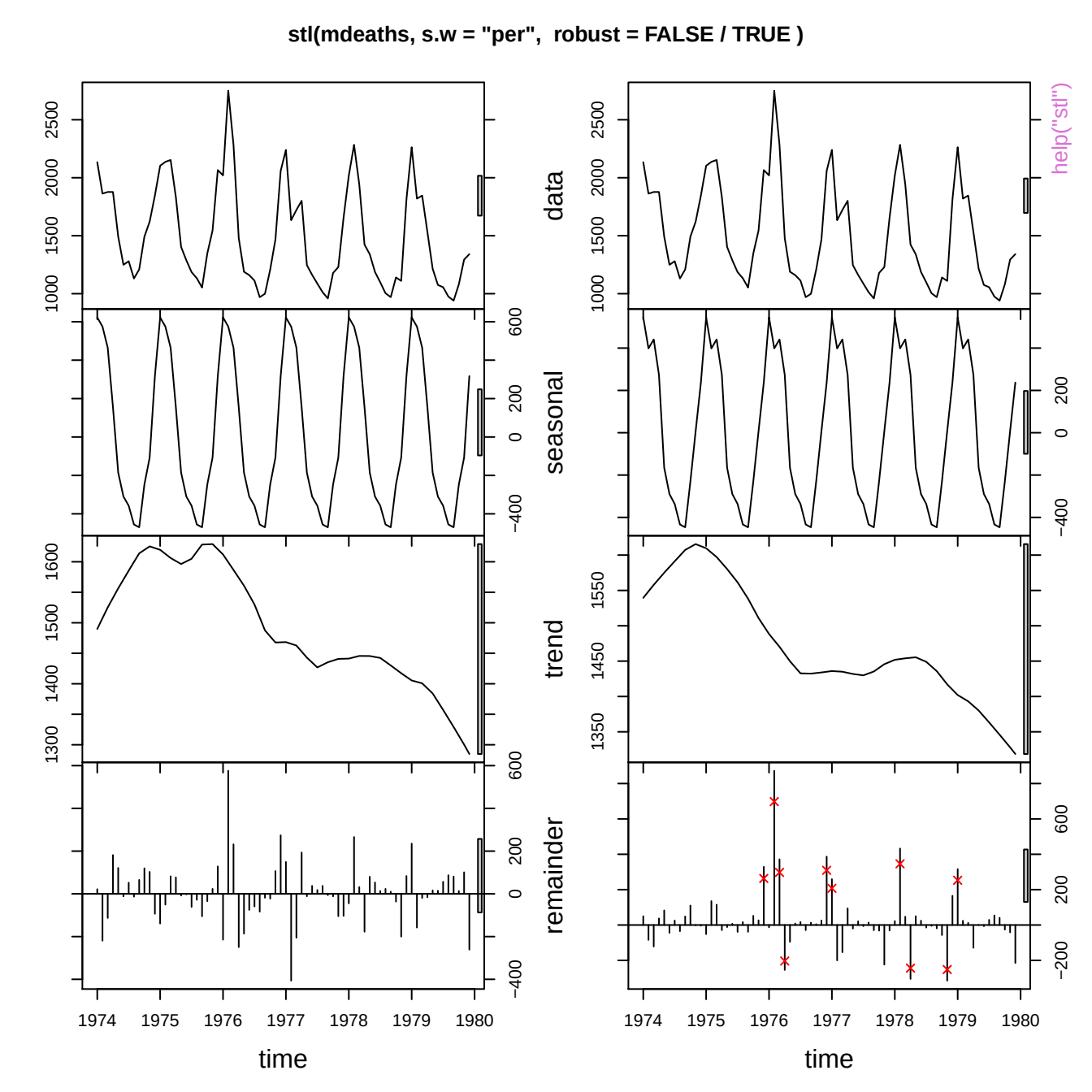

help("splinefun")
f
x.
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
8
10
12
14
16
18
20

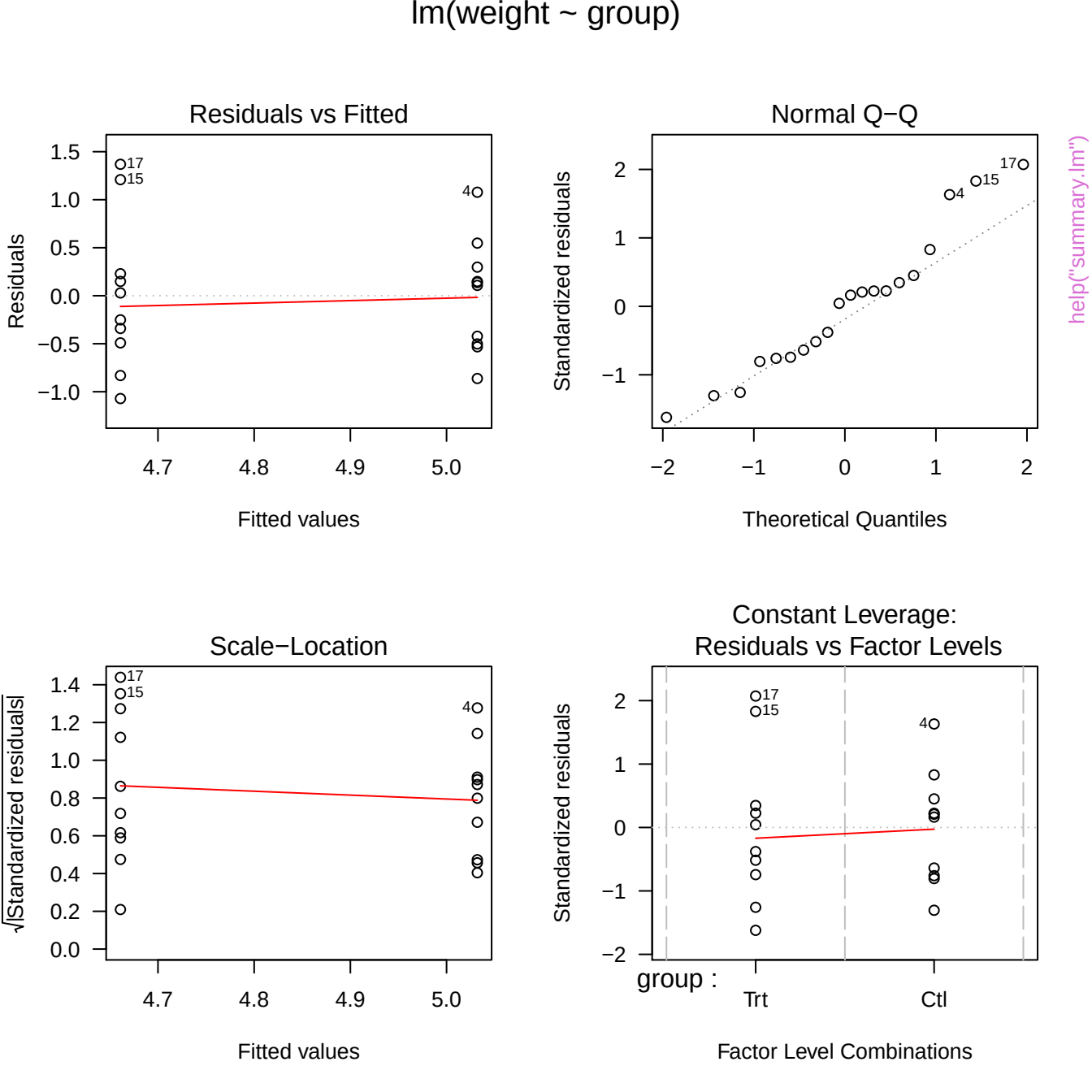

remainder
trend
seasonal
data
48
49
50
51
30
40
50
60
1920
1925
1930
1935
1940
time
−6
−4
−2
0
2
4
−10
−5
0
5
10
help("stl")

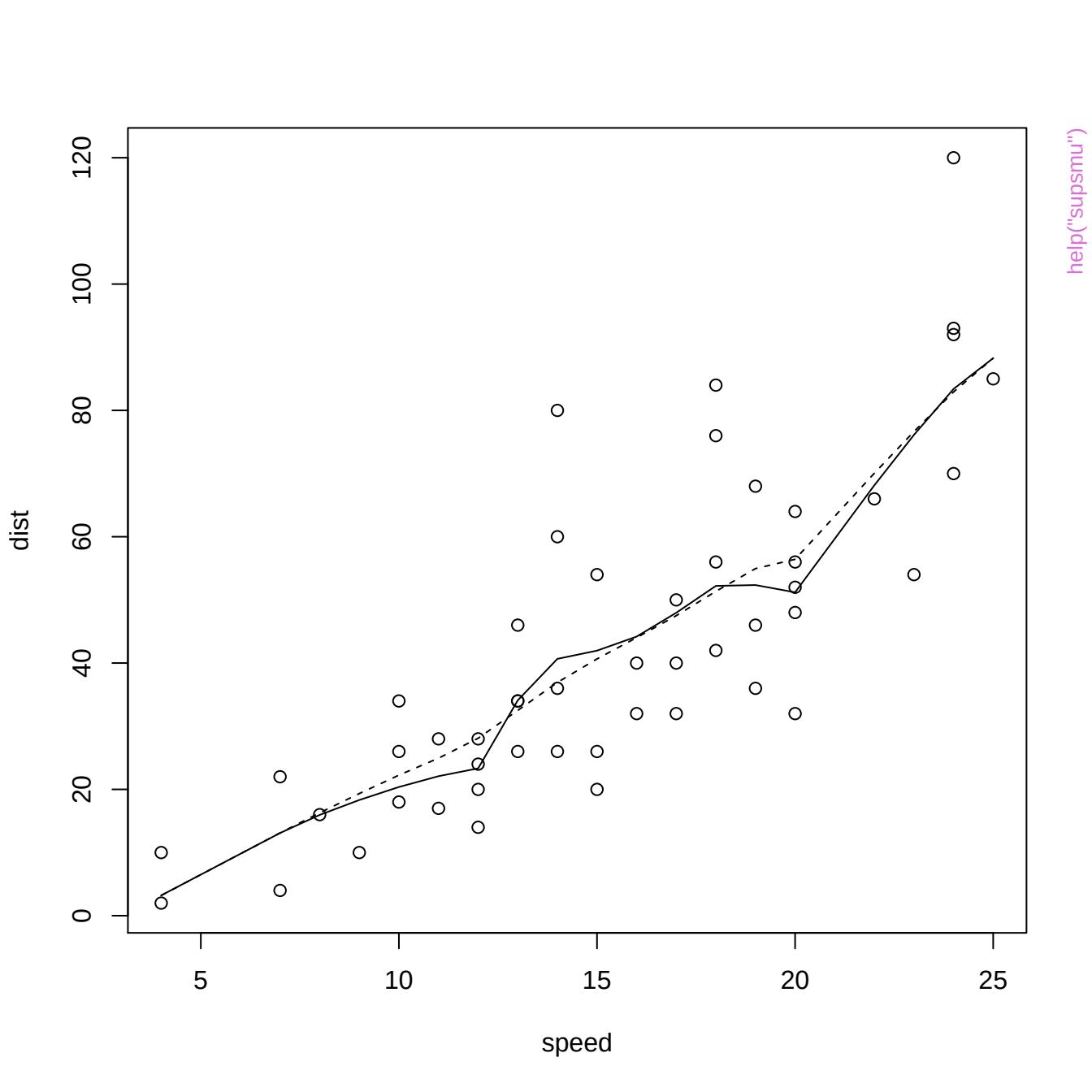

remainder
trend
seasonal
data
48.0
49.0
50.0
30
40
50
60
1920
1925
1930
1935
1940
time
−4
−2
0
2
4
6
−10
0
5
10
15
help("stl")

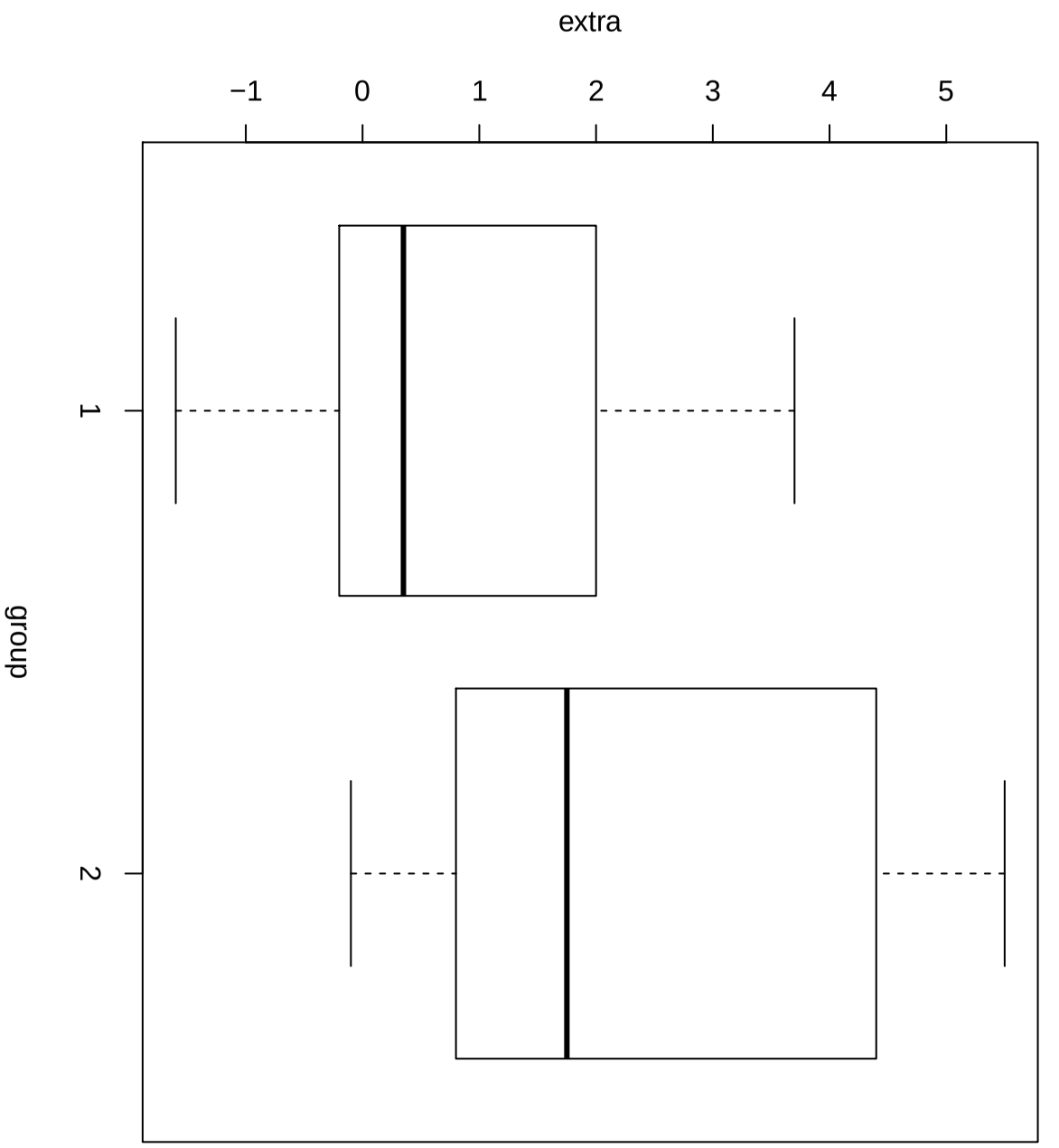

remainder
trend
seasonal
data
5.75
5.80
5.85
5.90
5.75
5.80
5.85
5.90
1960
1970
1980
1990
time
−0.002
0.000
0.002
−0.010
0.000
help("stl")


remainder
trend
seasonal
data
5.75
5.80
5.85
5.90
5.75
5.80
5.85
5.90
1960
1970
1980
1990
time
−0.005
0.005
−0.010
0.000
help("stl")


stl(mdeaths, s.w = "per", robust = FALSE / TRUE)
data
seasonal
trend
remainder
time
time
help("stl")

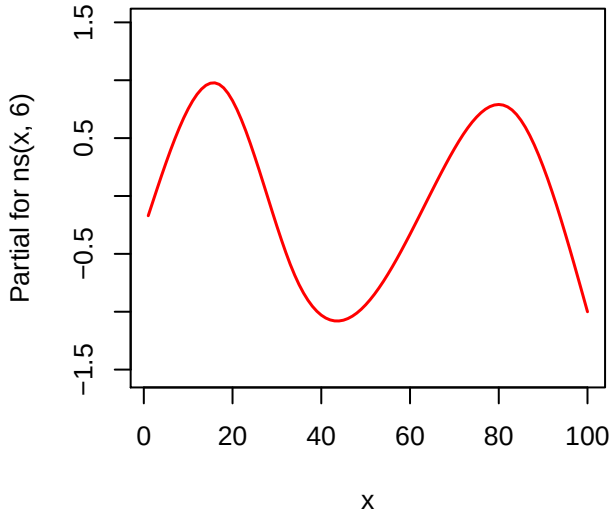

lm(weight ~ group)
Residuals vs Fitted
Residuals
Fitted values
17
15
4
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("summary.lm")
Scale−Location
√|Standardized residuals|
Constant Leverage:
Residuals vs Factor Levels
group :
Trt
Ctl
Factor Level Combinations

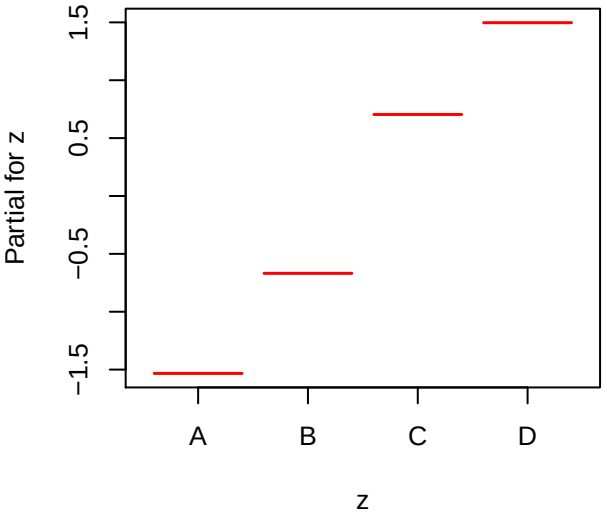

dist
speed
0
20
40
60
80
100
120
5
10
15
20
25
help("supsmu")



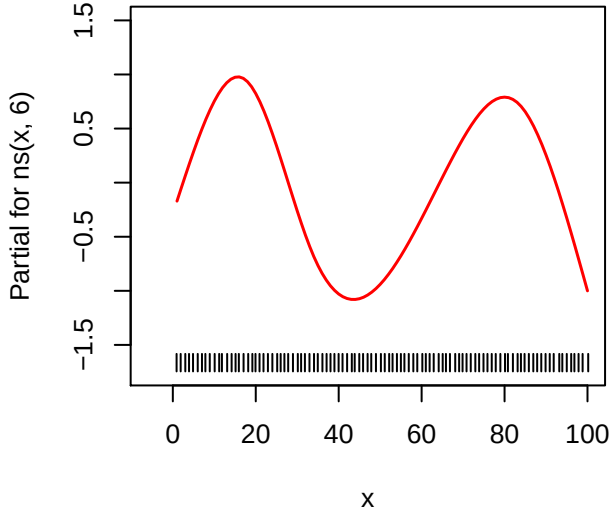
help("t.test")

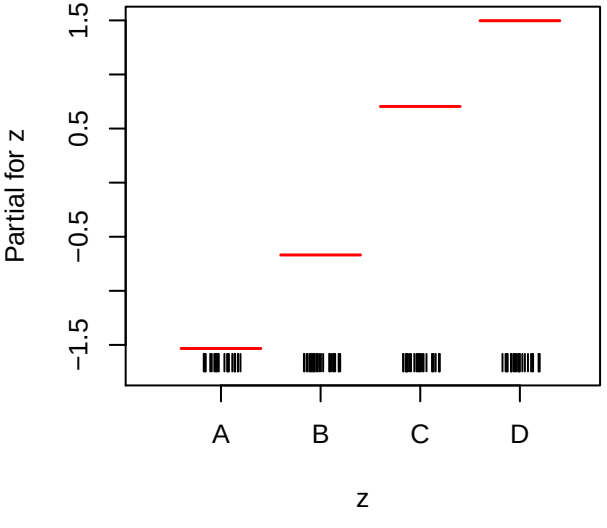
termplot(glm(formula = y ~ ns(x, 6) + z) . termplot(glm(formula = y ~ ns(x, 6) + z) .

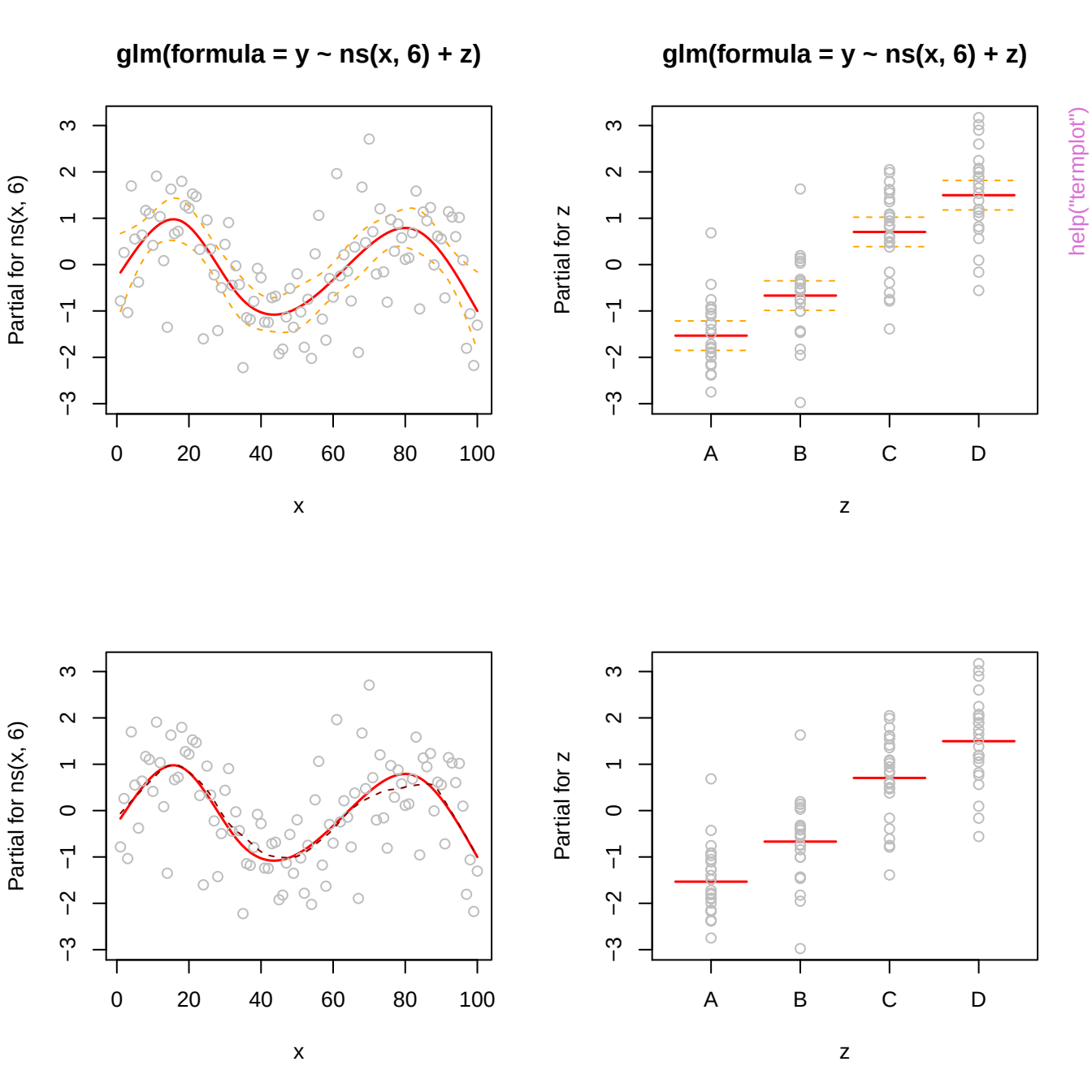


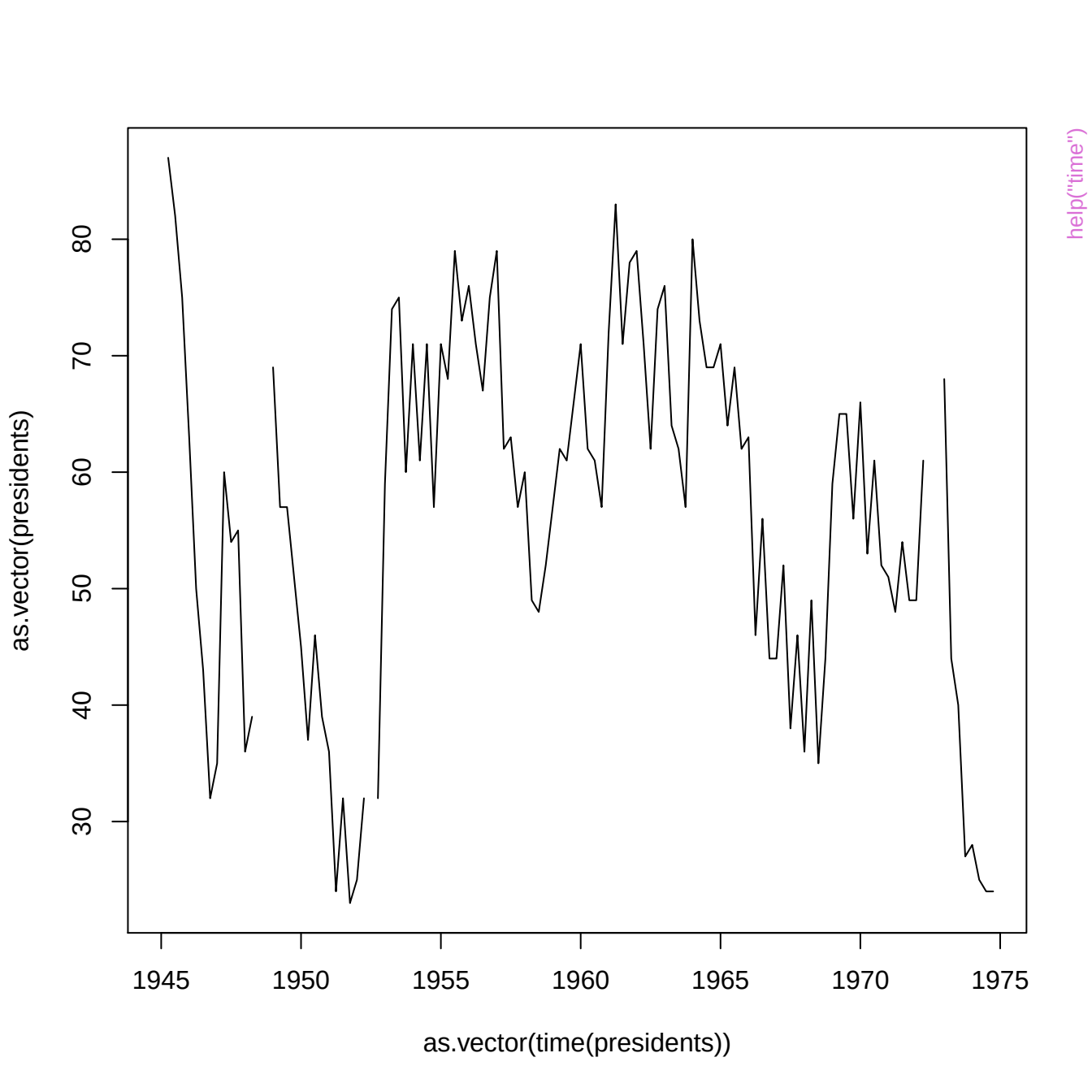


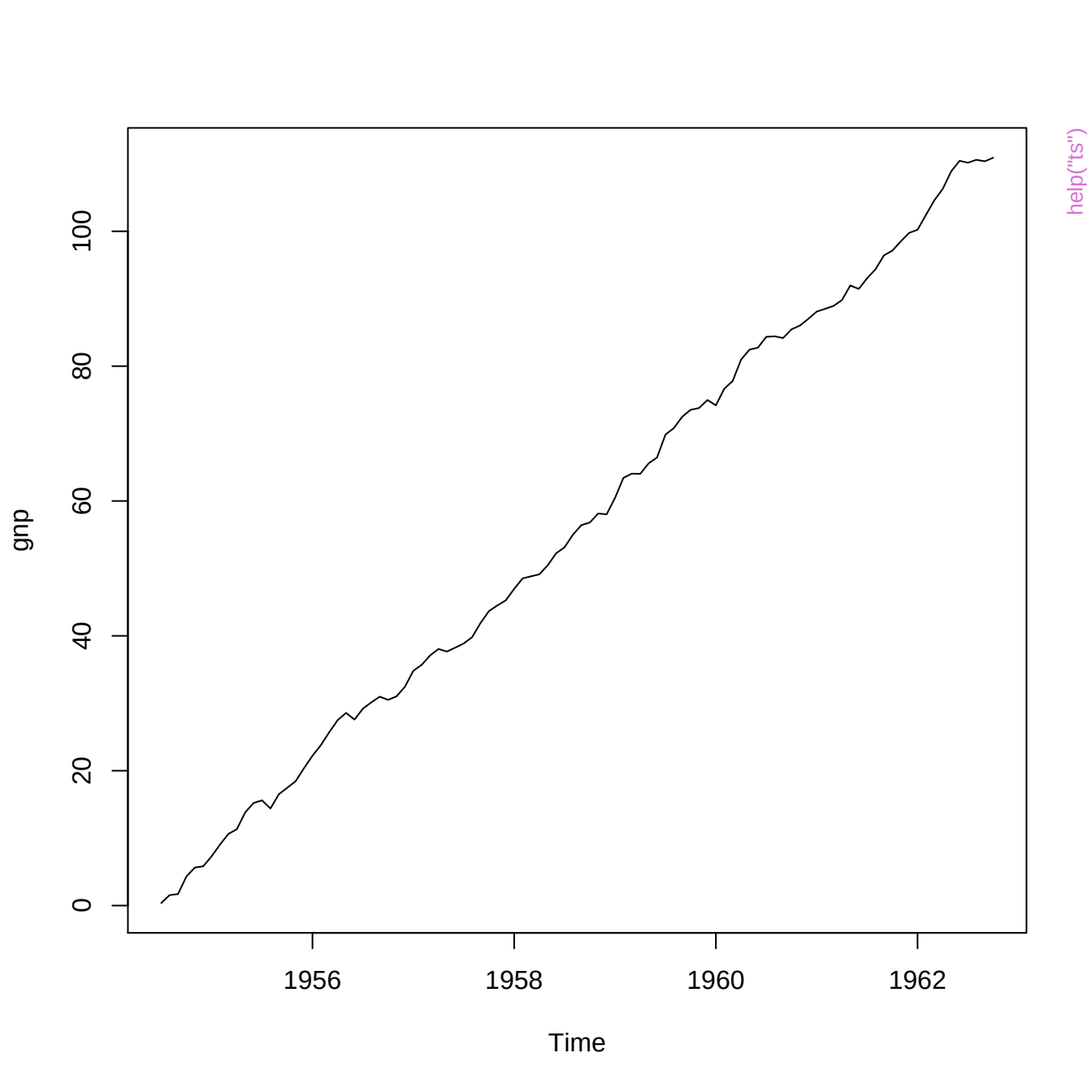
help("termplot")

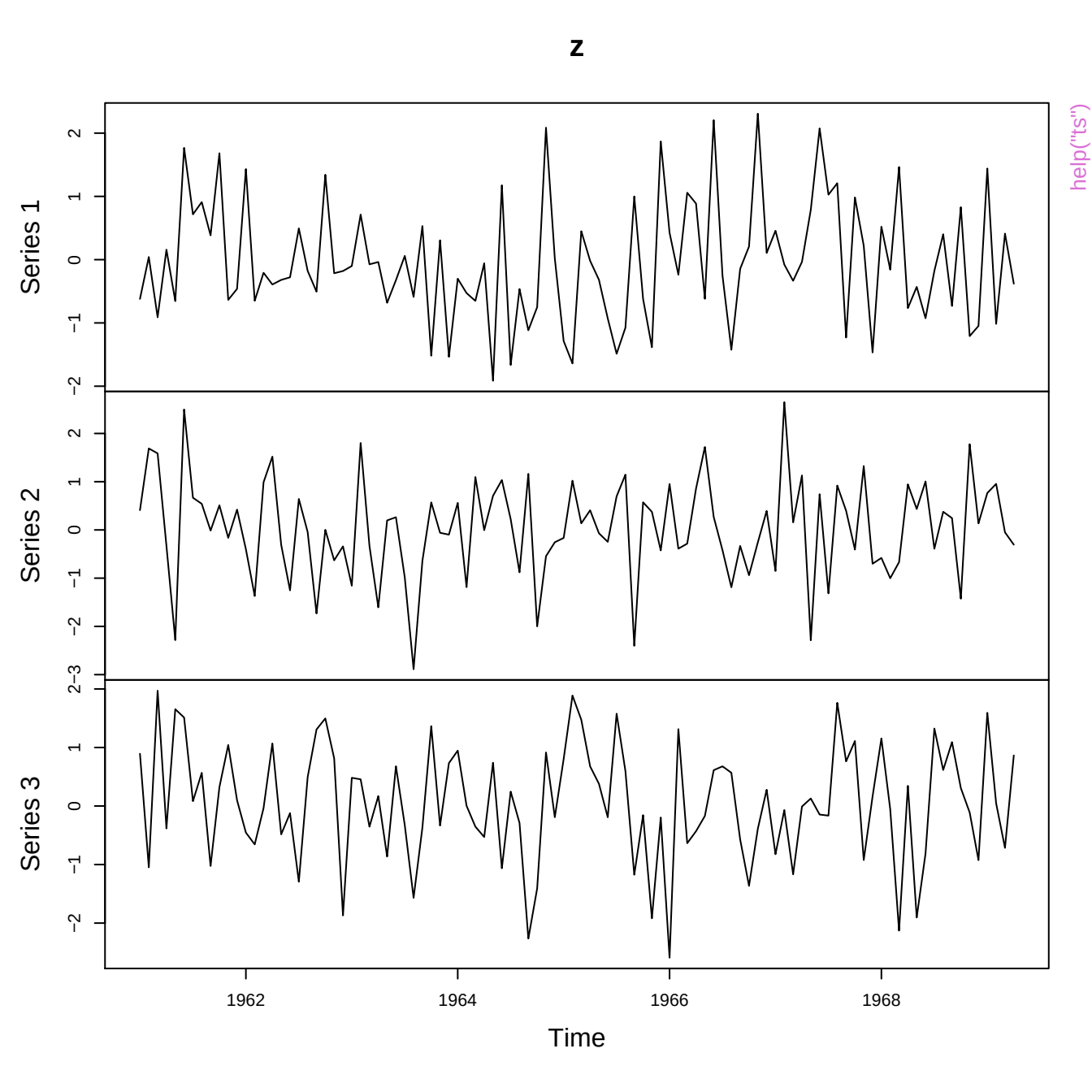


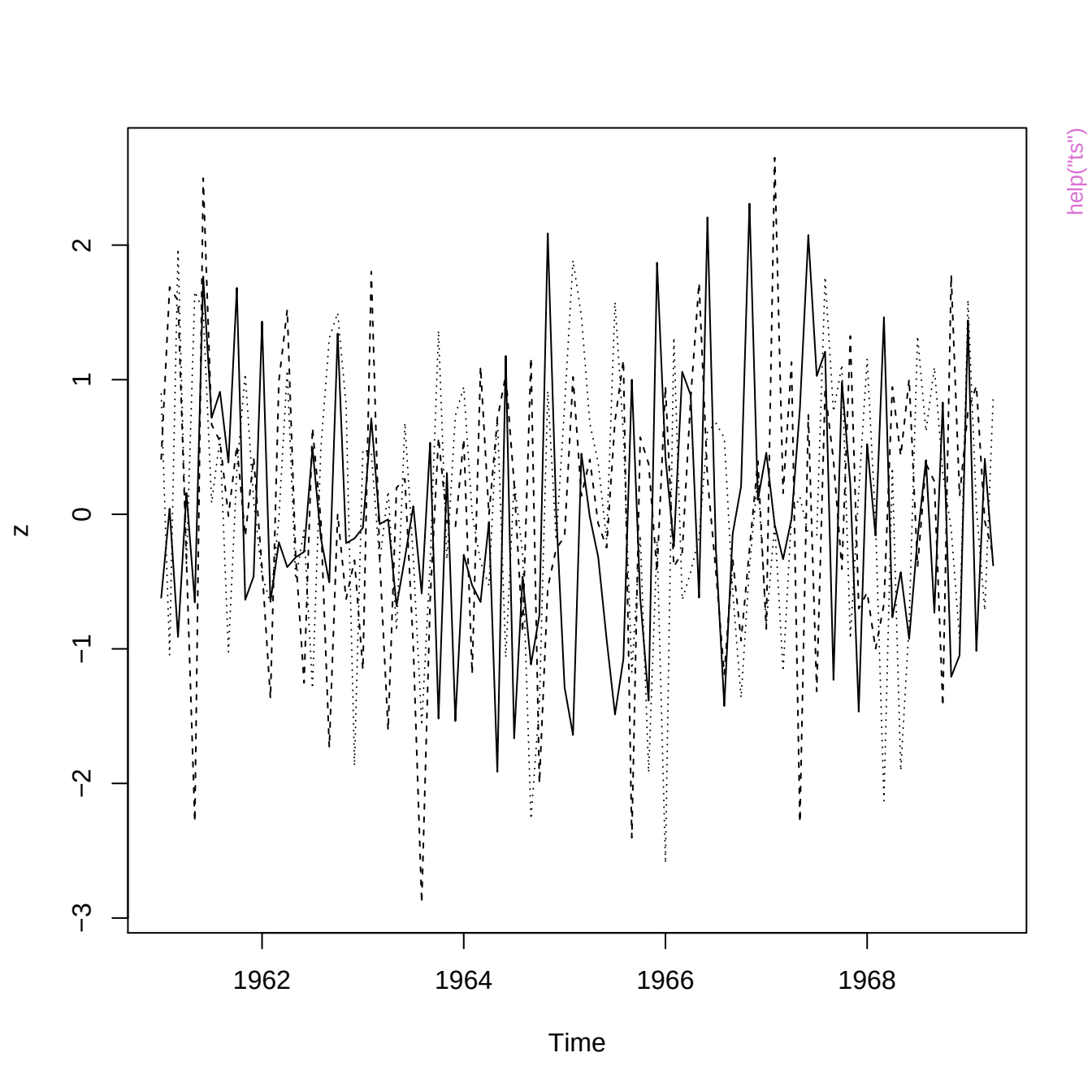


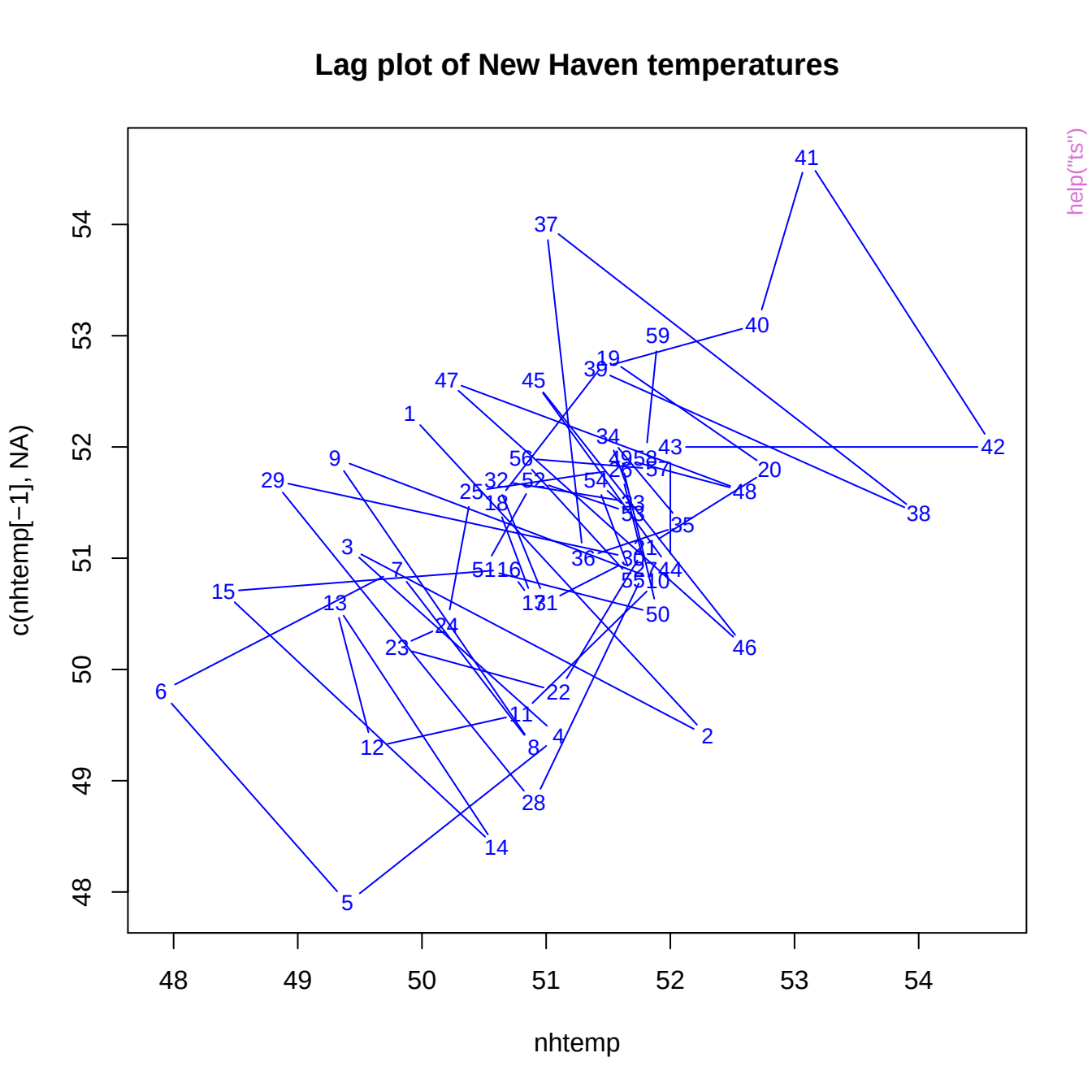

glm(formula = y ~ ns(x, 6) + z)
glm(formula = y ~ ns(x, 6) + z)
Partial for ns(x, 6)
Partial for z
x
z
A
B
C
D
help("termplot")

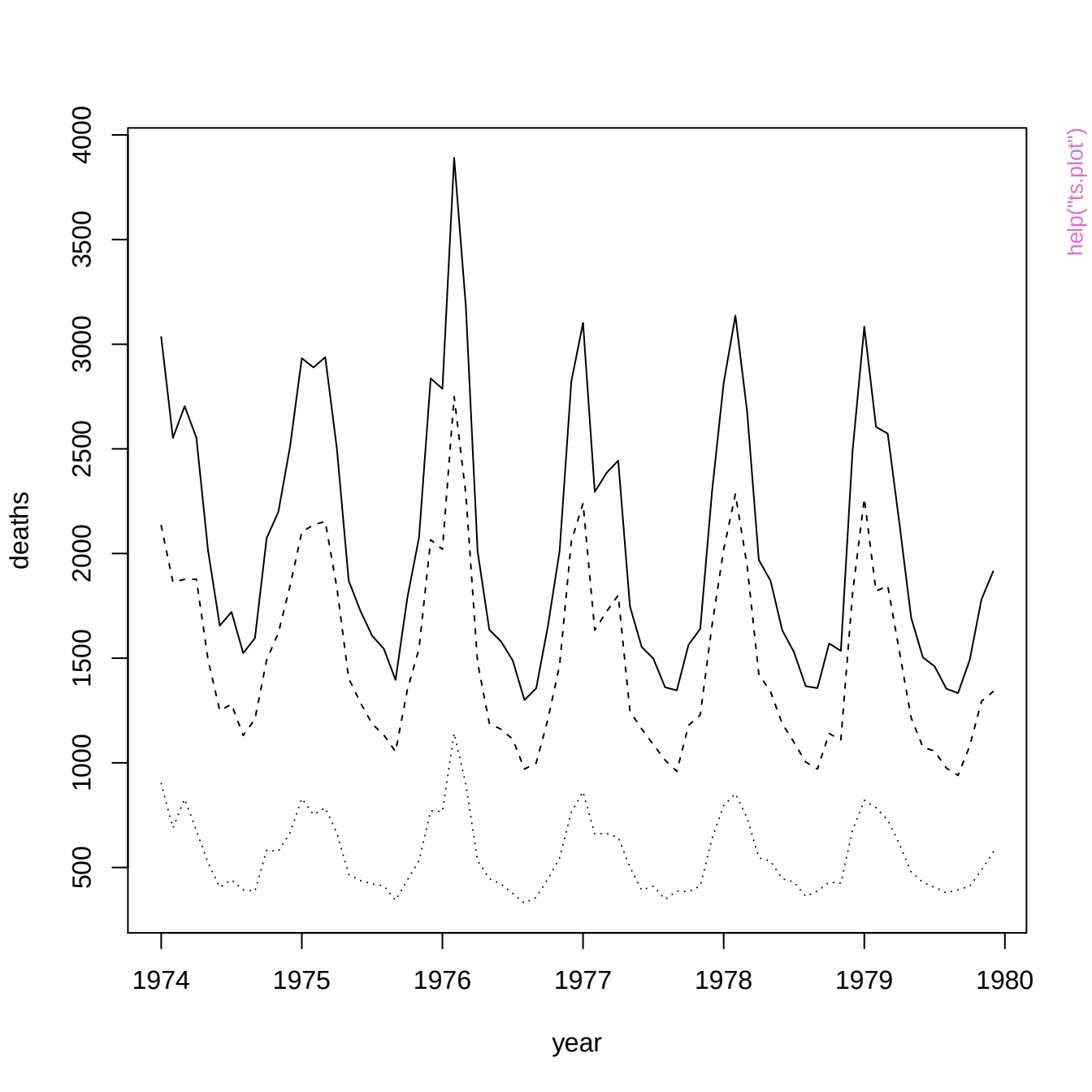

help("time")
as.vector(presidents)
30
40
50
60
70
80
1945
1950
1955
1960
1965
1970
1975
as.vector(time(presidents))

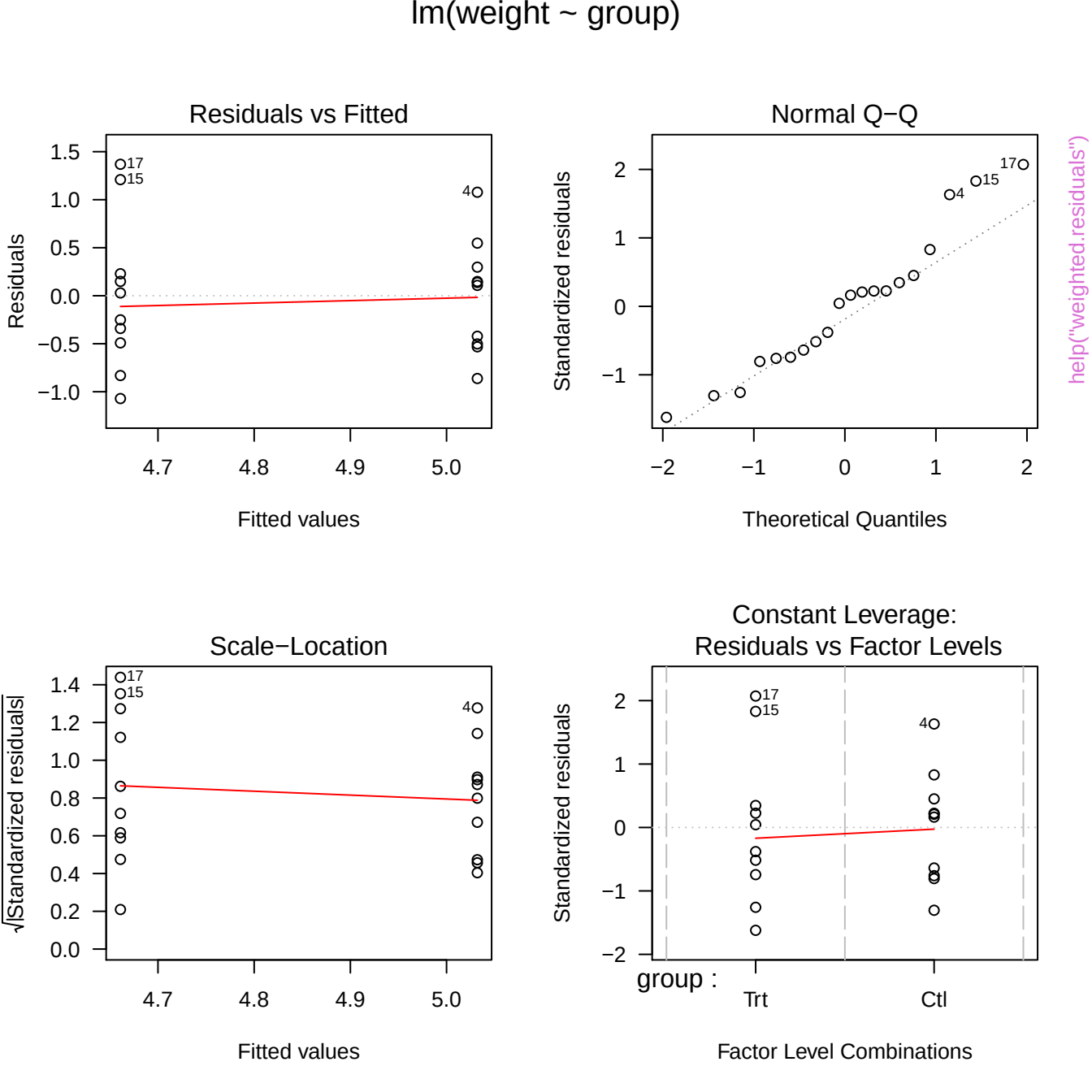

gnp
0
20
40
60
80
100
1956
1958
1960
1962
Time
help("ts")

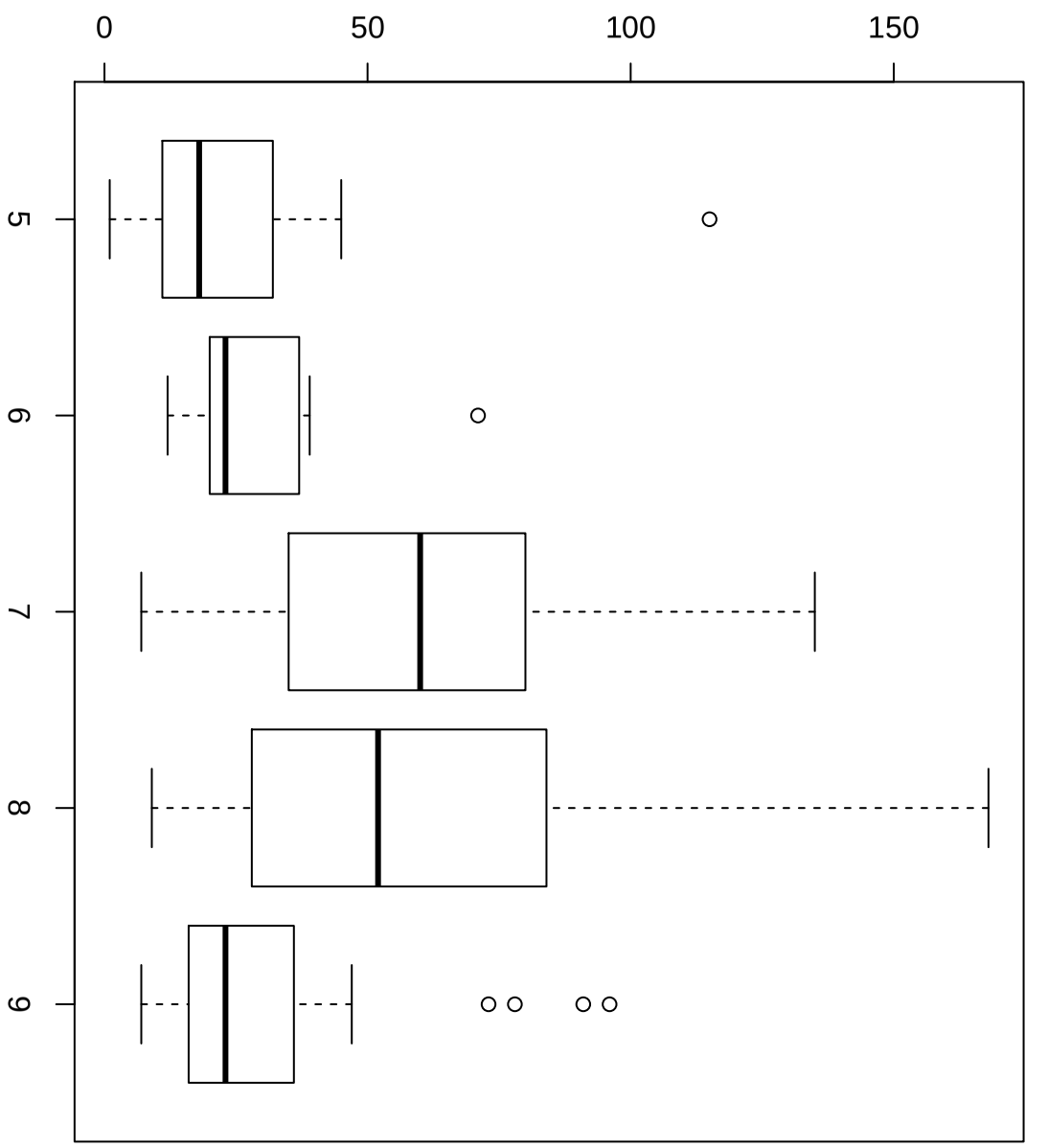

z
Series 1
Series 2
Series 3
Time
1962
1964
1966
1968
help("ts")


z
2
1
0
−1
−2
−3
1962
1964
1966
1968
Time
help("ts")


Lag plot of New Haven temperatures
c(nhtemp[−1], NA)
nhtemp
48
49
50
51
52
53
54
help("ts")


deaths
500
1000
1500
2000
2500
3000
3500
4000
1974
1975
1976
1977
1978
1979
1980
year
help("ts.plot")


lm(weight ~ group)
Residuals vs Fitted
Residuals
Fitted values
17
15
4
Normal Q−Q
Standardized residuals
Theoretical Quantiles
help("weighted.residuals")
Scale−Location
√|Standardized residuals|
Fitted values
Constant Leverage:
Residuals vs Factor Levels
Standardized residuals
group :
Trt
Ctl
Factor Level Combinations



help("wilcox.test")