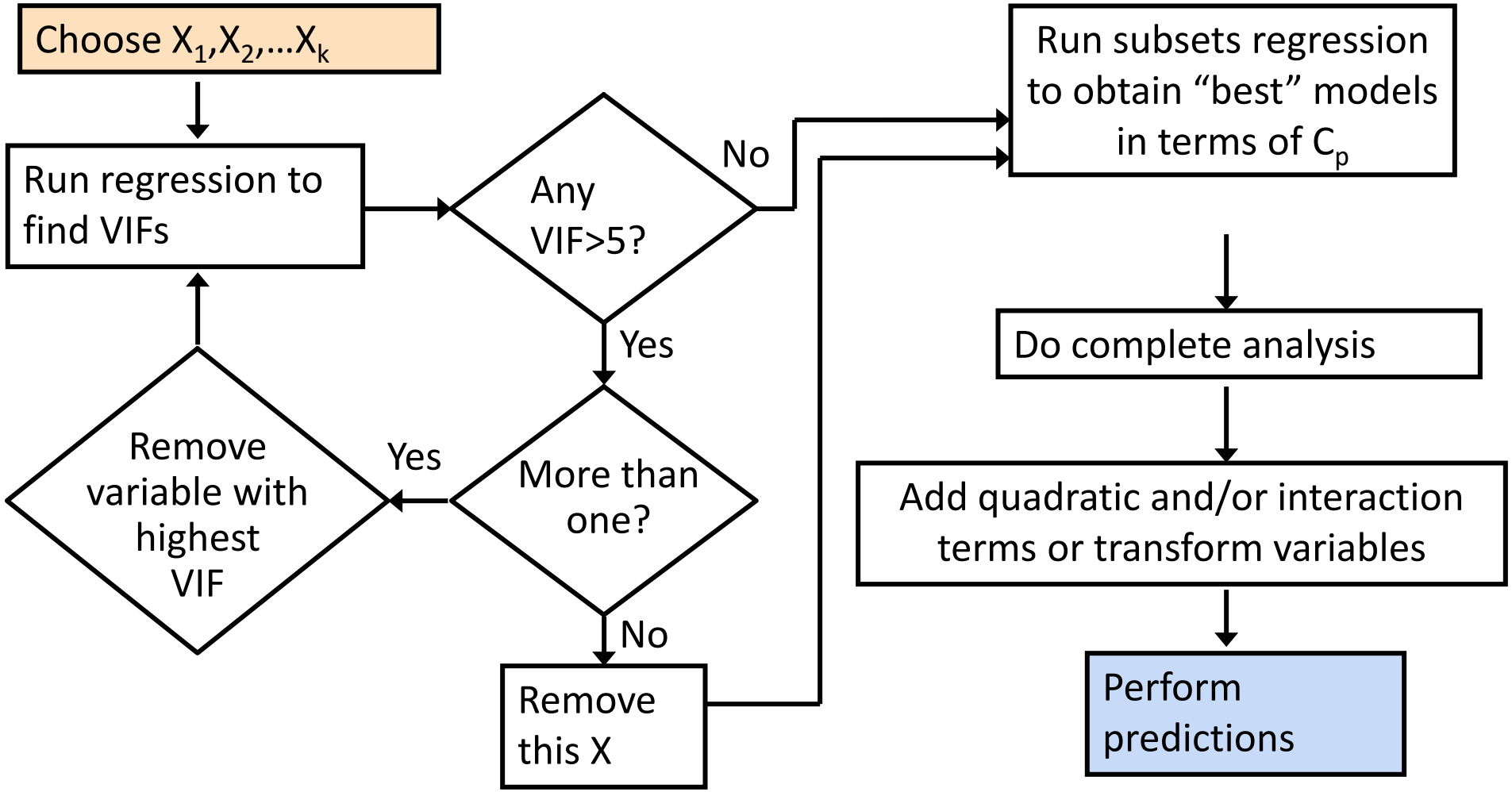
Multiple Linear Regression Analysis

Model Building Flowchart



Import file in R Studio

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function | Addins | Project: (None)

Untitled2* | GamingData | RCommander.R | .Rprofile | EAWE01

Filter | Cols: « < 1 - 50 > »

	ID	FEMALE	MALE	BYEAR	AGE	AGEMBTH	HHINC97	POVRAT97	HHBMBF	HHBMOF	HHOMBF	HHBMONLY	HHBFONLY	HHOT
1	618	0	1	1981	30	23	74100	396	1	0	0	0	0	
2	3253	0	1	1984	27	33	*NA*	*NA*	1	0	0	0	0	
3	537	0	1	1982	29	22	36960	231	0	0	0	1	0	
4	1367	0	1	1984	27	26	51512	324	1	0	0	0	0	

Showing 1 to 4 of 500 entries, 98 total columns

Console | Terminal | Background Jobs

R 4.3.1 · ~/

```
R version 4.3.1 (2023-06-16 ucrt) -- "Beagle Scouts"
Copyright (C) 2023 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

  Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

[Workspace loaded from ~/.RData]

> |
```

Environment | History | Connections | Tutorial

To Console | To Source

```
EAWE01 <- read_excel("EAWE01.xlsx")
View(EAWE01)
library(Rcmdr)
detach("package:Rcmdr", unload = TRUE)
library(Rcmdr)
detach("package:Rcmdr", unload = TRUE)
library(Rcmdr)
detach("package:Rcmdr", unload = TRUE)
library(Rcmdr)
library(Rcmdr)
library(readxl)
EAWE01 <- read_excel("EAWE01.xlsx")
View(EAWE01)
library(readxl)
EAWE01 <- read_excel("EAWE01.xlsx")
View(EAWE01)
```

Files | Plots | Packages | Help | Viewer | Presentation

New Folder | New Blank File | Delete | Rename | More

Home

Name	Size	Modified
NDD Adscientific.png	205.8 KB	Sep 5, 2023, 5:16 PM
NDD linkedin 1.png	38.9 KB	Sep 5, 2023, 5:30 PM
NDD linkedin.png	33.9 KB	Sep 5, 2023, 5:29 PM
Panel Data Regression Resources		
REIT Undergrad		
REITS		
Reits 10Sept2023.xlsx	12.6 KB	Sep 10, 2023, 4:38 PM
Reits 16Oct2023.xlsx	210.1 KB	Oct 16, 2023, 5:44 PM
Reits 17Sept2023.xlsx	24.3 KB	Sep 17, 2023, 12:32 AM
Reits 18Sept2023.xlsx	216.1 KB	Oct 28, 2023, 7:35 PM
RSI.xlsx	11.2 KB	Oct 28, 2023, 7:34 PM
Ryli R.docx	13.3 KB	Aug 28, 2023, 5:22 PM
SafeNet Sentinel		
Screen Recorder		
Special FInance Topic GEM		
SPSSInc		
Time Series Regression Resources		
Treeplot Transform Codes.txt	127 B	Oct 28, 2023, 7:36 PM
ViberD		
VUL		
Zoom		
EAWE01.xlsx	223.8 KB	Feb 3, 2024, 6:45 AM

View File
Import Dataset...

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function | Addins | Project: (None)

Untitled2* | GamingData | RCommander.R | .Rprofile | EAWE01

Environment | History | Connections | Tutorial

Import Excel Data

File/URL:

~/EAWE01.xlsx | Update

Data Preview:

ID (double)	FEMALE (double)	MALE (double)	BYEAR (double)	AGE (double)	AGEMBTH (double)	HHINC97 (double)	POVRAT97 (double)	HHBMBF (double)	HHBMOF (double)	HHOMBF (double)	HHBMONLY (double)	HHBFONLY (double)	HHOTHER (double)	MSA97NO (double)	MSA97NCC (double)
618	0	1	1981	30	23	74100	396	1	0	0	0	0	0	0	
3253	0	1	1984	27	33	NA	NA	1	0	0	0	0	0	0	
537	0	1	1982	29	22	36960	231	0	0	0	1	0	0	0	
1367	0	1	1984	27	26	51512	324	1	0	0	0	0	0	0	
4193	0	1	1982	29	23	974	6	0	0	0	1	0	0	0	
5611	0	1	1981	30	22	NA	NA	0	0	0	0	0	1	1	
5781	0	1	1980	31	20	1200	8	1	0	0	0	0	0	0	
2394	0	1	1982	29	28	NA	NA	1	0	0	0	0	0	0	
2941	0	1	1983	28	32	246474	1627	1	0	0	0	0	0	0	
1827	0	1	1982	29	32	109000	582	1	0	0	0	0	0	0	
5321	0	1	1980	31	29	NA	NA	0	1	0	0	0	0	1	
3247	0	1	1981	30	30	67300	351	1	0	0	0	0	0	0	
688	0	1	1982	29	26	NA	NA	0	1	0	0	0	0	0	
4668	0	1	1982	29	17	38000	203	1	0	0	0	0	0	0	
1323	0	1	1984	27	33	81265	368	1	0	0	0	0	0	0	
3643	0	1	1984	27	34	72000	453	1	0	0	0	0	0	0	
5986	0	1	1981	30	18	39000	166	1	0	0	0	0	0	0	
89	0	1	1981	30	15	NA	NA	1	0	0	0	0	0	0	
4457	0	1	1983	28	26	87000	547	1	0	0	0	0	0	0	
8907	0	1	1981	30	27	35000	187	1	0	0	0	0	0	0	

Previewing first 50 entries.

Import Options:

Name: EAWE01 | Max Rows:

Sheet: Default | Skip: 0

Range: A1:D10 | NA:

☑ First Row as Names

☑ Open Data Viewer

Code Preview:

```
library(readxl)
EAWE01 <- read_excel("EAWE01.xlsx")
View(EAWE01)
```

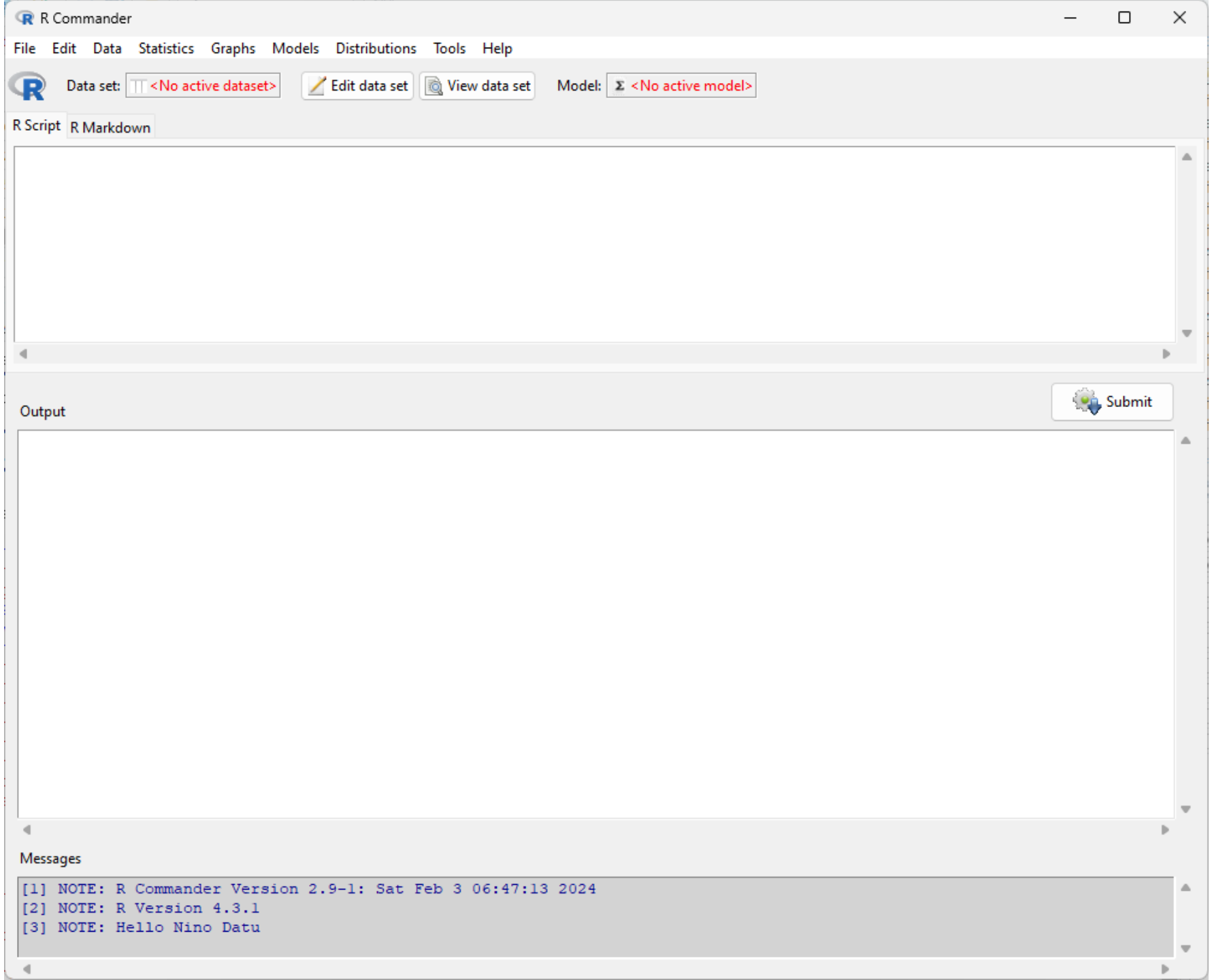
Reading Excel files using readxl

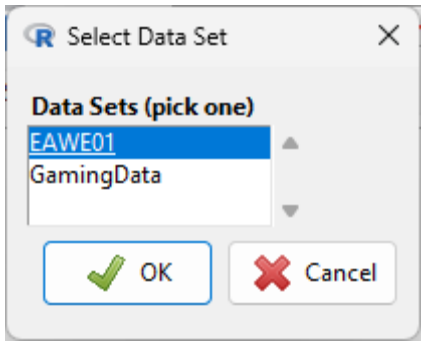
Import | Cancel

Zoom

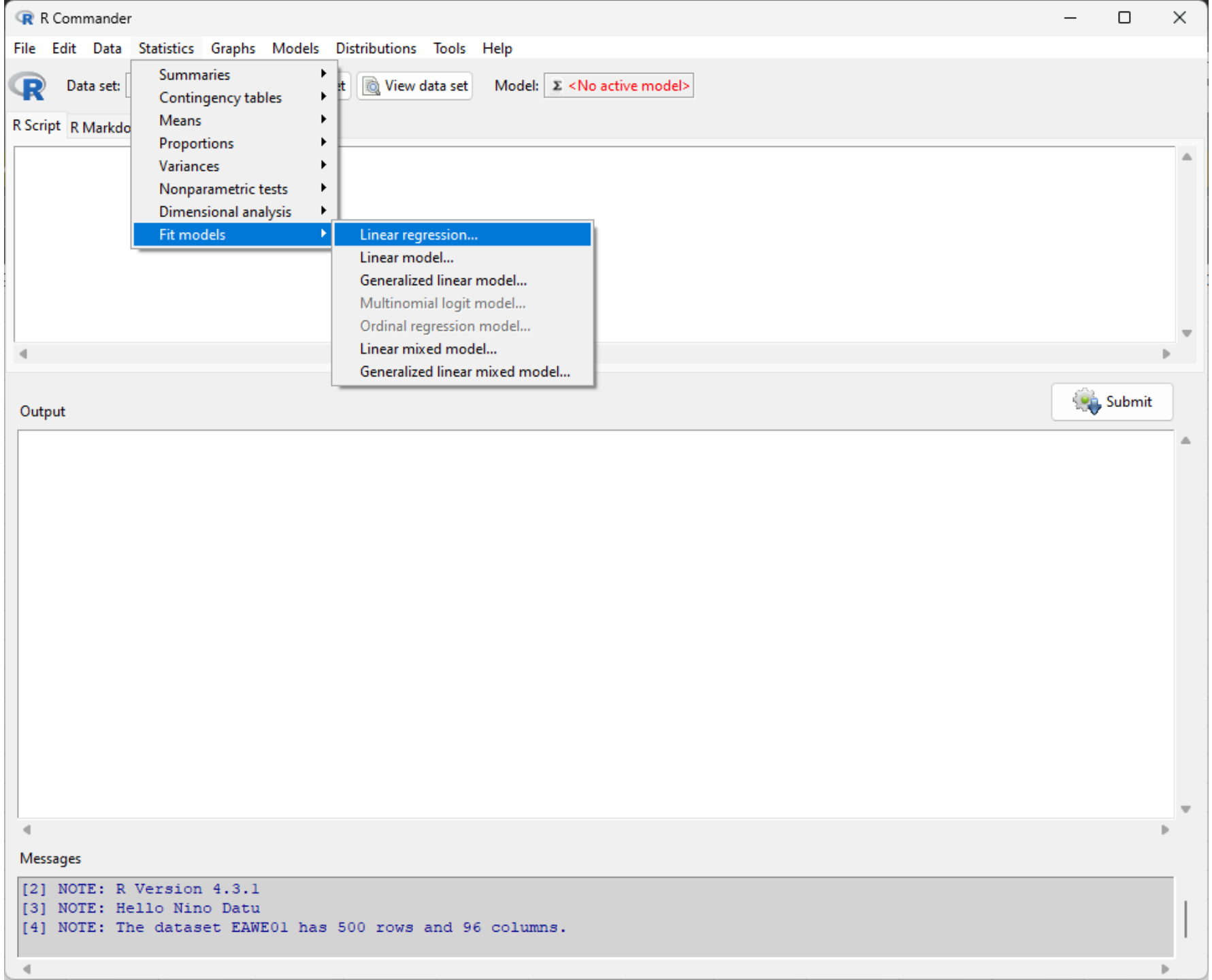
EAWE01.xlsx 223.8 KB Feb 3, 2024, 6:45 AM

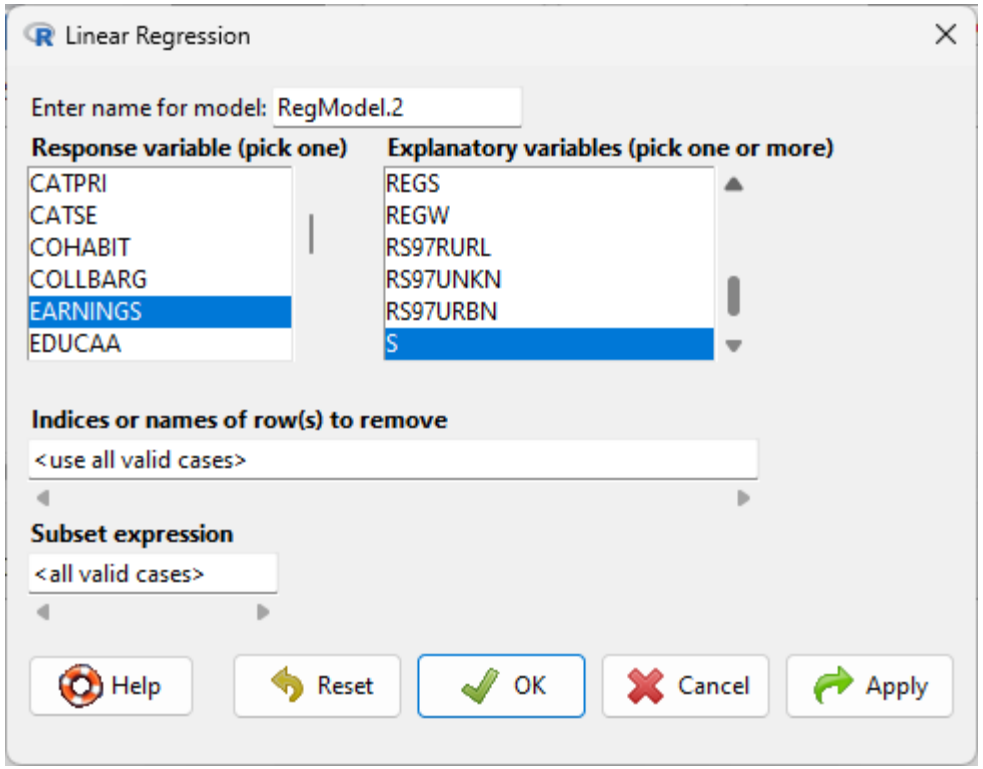
Import file in R Commander

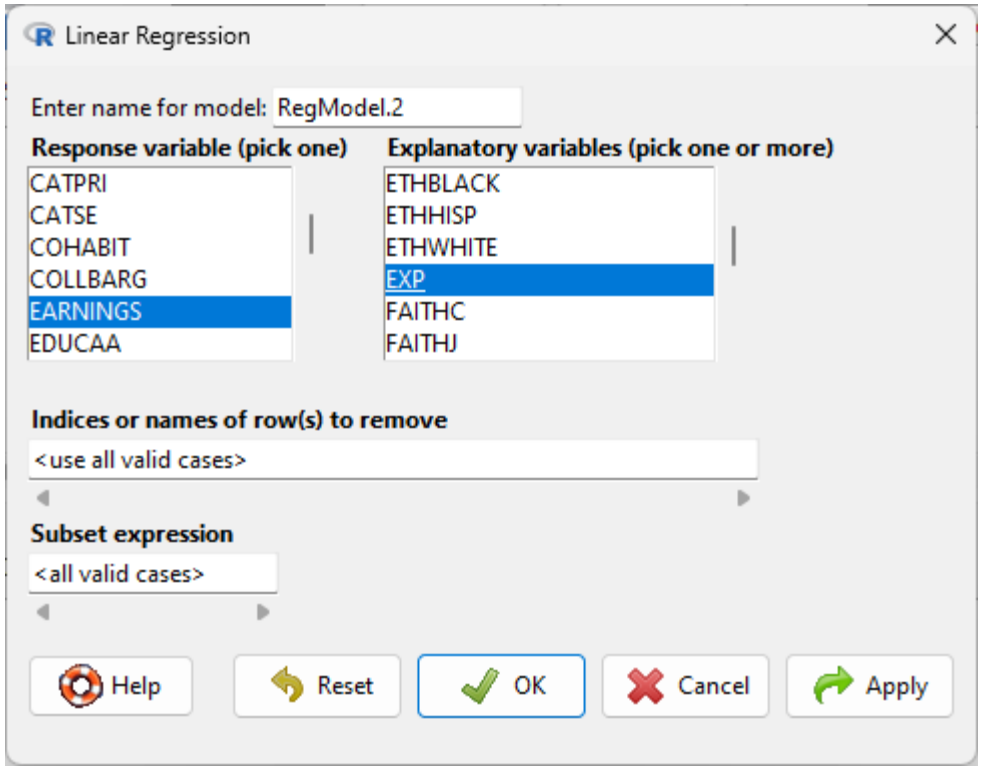

R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: <No active dataset>
Edit data set
View data set
Model: Σ <No active model>
R Script
R Markdown
Output
Submit
Messages
[1] NOTE: R Commander Version 2.9-1: Sat Feb 3 06:47:13 2024
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu


Select Data Set
Data Sets (pick one)
EAWE01
GamingData
OK
Cancel

Running the Regression Model


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Summaries
Contingency tables
Means
Proportions
Variances
Nonparametric tests
Dimensional analysis
Fit models
Linear regression...
Linear model...
Generalized linear model...
Multinomial logit model...
Ordinal regression model...
Linear mixed model...
Generalized linear mixed model...
Data set:
View data set
Model: <No active model>
R Script
Submit
Output
Messages
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 96 columns.


Linear Regression
Enter name for model: RegModel.2
Response variable (pick one)
Explanatory variables (pick one or more)
CATPRI
CATSE
COHABIT
COLLBARG
EARNINGS
EDUCAA
REGS
REGW
RS97RURL
RS97UNKN
RS97URBN
S
Indices or names of row(s) to remove
<use all valid cases>
Subset expression
<all valid cases>
Help
Reset
OK
Cancel
Apply


Linear Regression
Enter name for model: RegModel.2
Response variable (pick one)
Explanatory variables (pick one or more)
CATPRI
CATSE
COHABIT
COLLBARG
EARNINGS
EDUCAA
ETHBLACK
ETHHISP
ETHWHITE
EXP
FAITHC
FAITHJ
Indices or names of row(s) to remove
<use all valid cases>
Subset expression
<all valid cases>
Help
Reset
OK
Cancel
Apply

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.2

R Script | R Markdown

```
RegModel.2 <- lm(EARNINGS~EXP+S, data=EAWE01)
summary(RegModel.2)
```

Submit

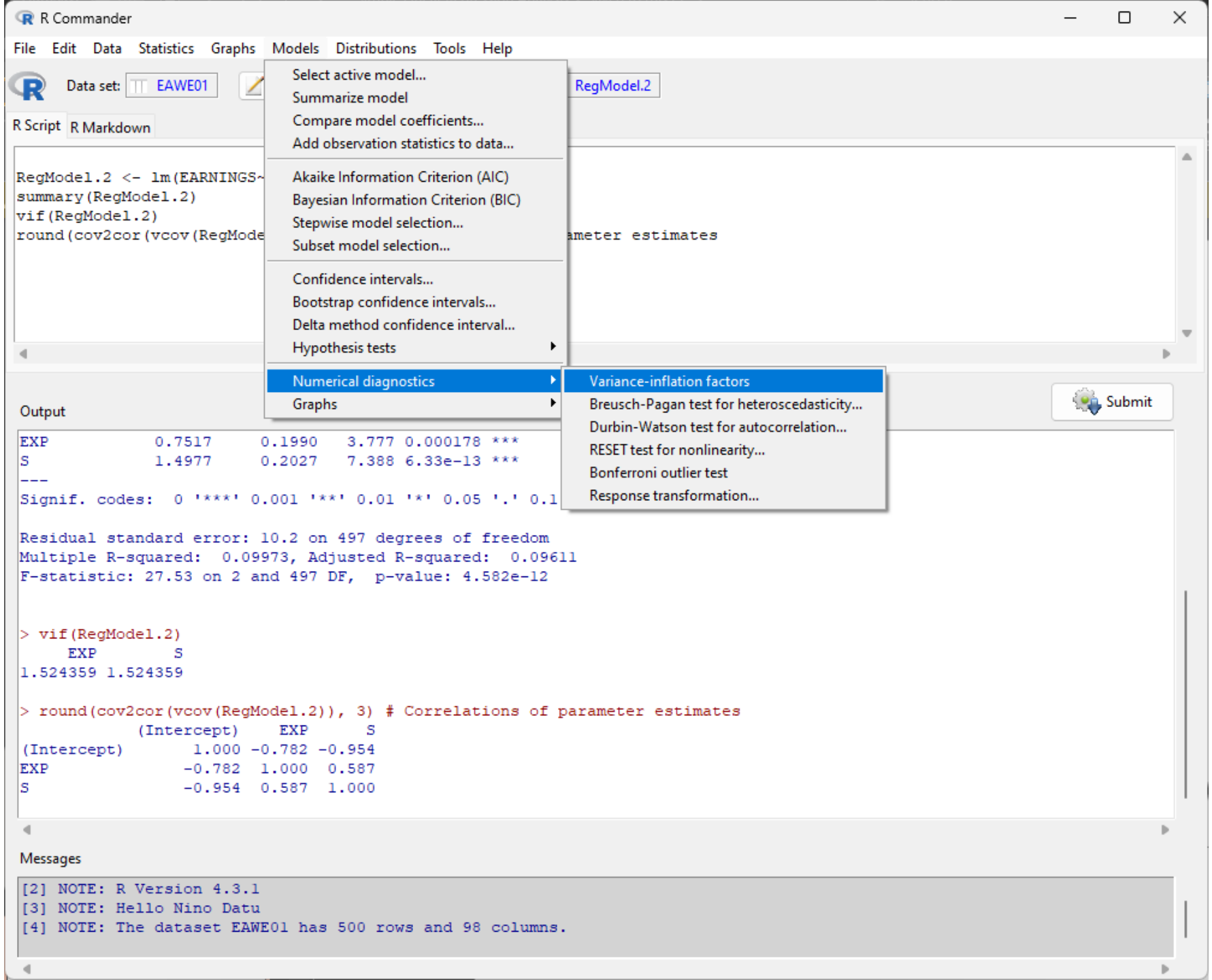
Output

```
Call:
lm(formula = EARNINGS ~ EXP + S, data = EAWE01)

Residuals:
    Min      1Q  Median      3Q     Max
-19.186  -6.264  -1.788   3.429  88.023

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  -8.4500     3.9050  -2.164 0.030947 *
EXP           0.7517     0.1990   3.777 0.000178 ***
S             1.4977     0.2027   7.388 6.33e-13 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10.2 on 497 degrees of freedom
Multiple R-squared:  0.09973, Adjusted R-squared:  0.09611
F-statistic: 27.53 on 2 and 497 DF,  p-value: 4.582e-12
```

Messages

```
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```

Multicollinearity Test


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: EAWE01
RegModel.2
R Script R Markdown
RegModel.2 <- lm(EARNINGS~
summary(RegModel.2)
vif(RegModel.2)
round(cov2cor(vcov(RegMode
ameter estimates
Select active model...
Summarize model
Compare model coefficients...
Add observation statistics to data...
Akaike Information Criterion (AIC)
Bayesian Information Criterion (BIC)
Stepwise model selection...
Subset model selection...
Confidence intervals...
Bootstrap confidence intervals...
Delta method confidence interval...
Hypothesis tests
Numerical diagnostics
Graphs
Variance-inflation factors
Breusch-Pagan test for heteroscedasticity...
Durbin-Watson test for autocorrelation...
RESET test for nonlinearity...
Bonferroni outlier test
Response transformation...
Submit
Output
EXP 0.7517 0.1990 3.777 0.000178 ***
S 1.4977 0.2027 7.388 6.33e-13 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1
Residual standard error: 10.2 on 497 degrees of freedom
Multiple R-squared: 0.09973, Adjusted R-squared: 0.09611
F-statistic: 27.53 on 2 and 497 DF, p-value: 4.582e-12
> vif(RegModel.2)
EXP S
1.524359 1.524359
> round(cov2cor(vcov(RegModel.2)), 3) # Correlations of parameter estimates
(Intercept) EXP S
(Intercept) 1.000 -0.782 -0.954
EXP -0.782 1.000 0.587
S -0.954 0.587 1.000
Messages
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.2

R Script | R Markdown

```
RegModel.2 <- lm(EARNINGS~EXP+S, data=EAWE01)
summary(RegModel.2)
vif(RegModel.2)
round(cov2cor(vcov(RegModel.2)), 3) # Correlations of parameter estimates
```

Submit

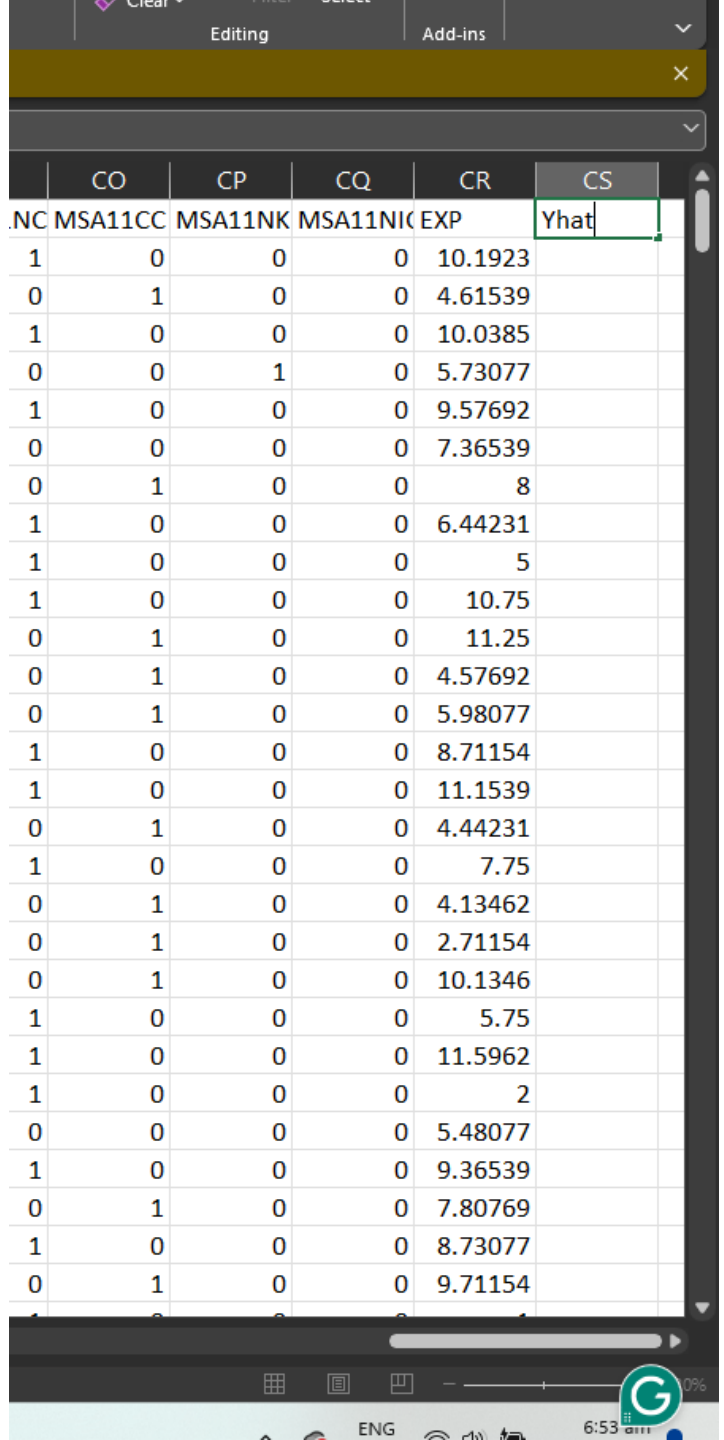
Output

```
EXP           0.7517     0.1990   3.777 0.000178 ***
S             1.4977     0.2027   7.388 6.33e-13 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10.2 on 497 degrees of freedom
Multiple R-squared:  0.09973, Adjusted R-squared:  0.09611
F-statistic: 27.53 on 2 and 497 DF,  p-value: 4.582e-12


> vif(RegModel.2)
     EXP        S
1.524359 1.524359

> round(cov2cor(vcov(RegModel.2)), 3) # Correlations of parameter estimates
            (Intercept)    EXP      S
(Intercept)       1.000 -0.782 -0.954
EXP              -0.782  1.000  0.587
S                -0.954  0.587  1.000
```

Messages

```
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```

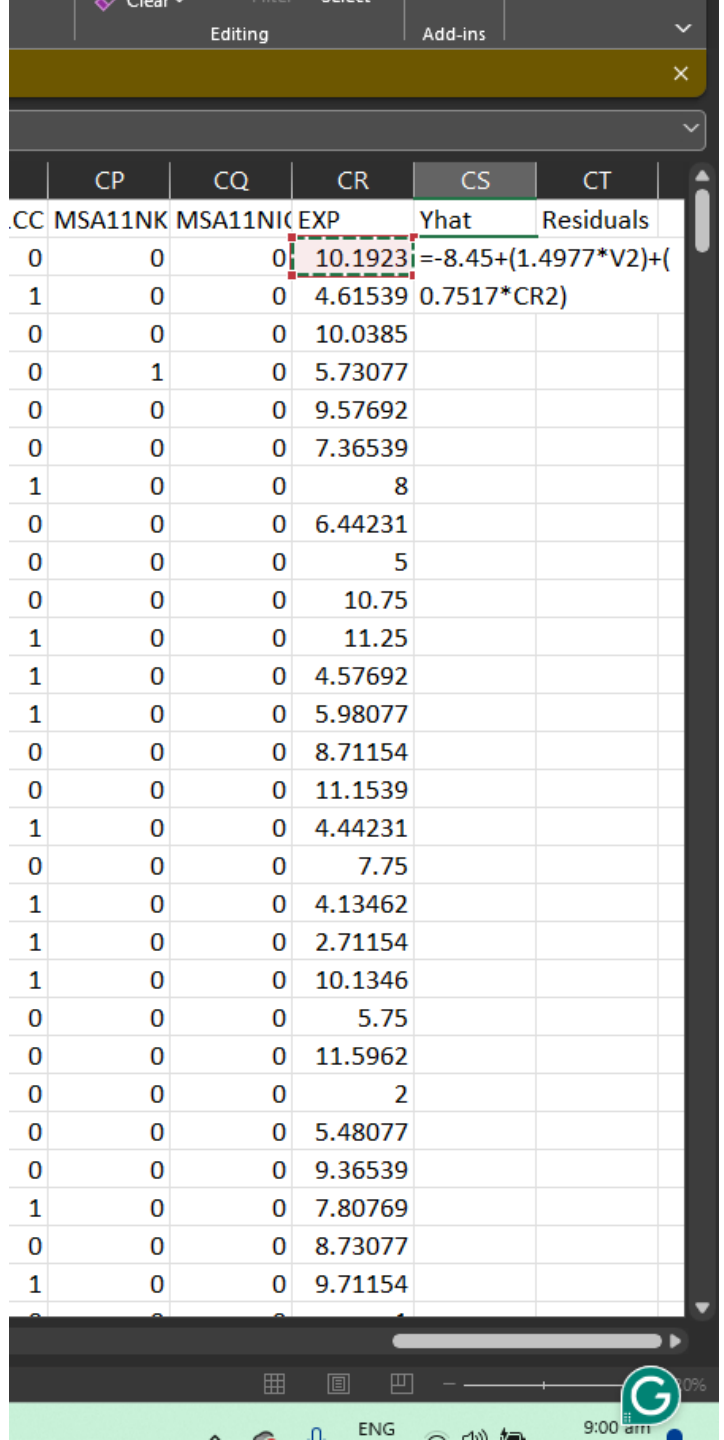
Generate Yhat(Fitted/Predicted values of Y)



Editing
Add-ins

	CO	CP	CQ	CR	CS
.NC	MSA11CC	MSA11NK	MSA11NI(	EXP	Yhat
1	0	0	0	10.1923	
0	1	0	0	4.61539	
1	0	0	0	10.0385	
0	0	1	0	5.73077	
1	0	0	0	9.57692	
0	0	0	0	7.36539	
0	1	0	0	8	
1	0	0	0	6.44231	
1	0	0	0	5	
1	0	0	0	10.75	
0	1	0	0	11.25	
0	1	0	0	4.57692	
0	1	0	0	5.98077	
1	0	0	0	8.71154	
1	0	0	0	11.1539	
0	1	0	0	4.44231	
1	0	0	0	7.75	
0	1	0	0	4.13462	
0	1	0	0	2.71154	
0	1	0	0	10.1346	
1	0	0	0	5.75	
1	0	0	0	11.5962	
1	0	0	0	2	
0	0	0	0	5.48077	
1	0	0	0	9.36539	
0	1	0	0	7.80769	
1	0	0	0	8.73077	
0	1	0	0	9.71154	

ENG
6:53 am

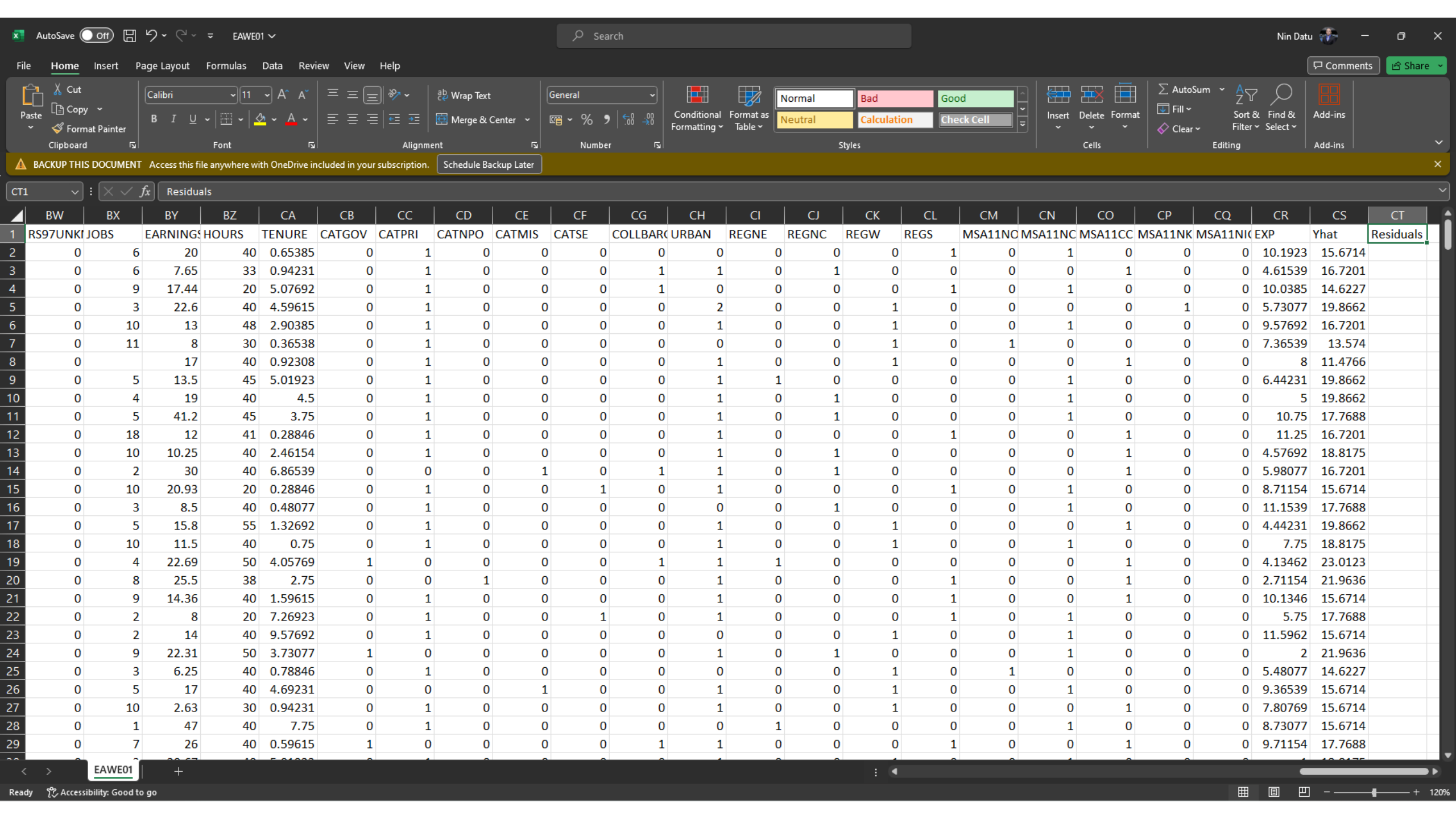


Editing Add-ins

	CP	CQ	CR	CS	CT
CC	MSA11NK	MSA11NI(	EXP	Yhat	Residuals
0	0	0	10.1923	=-8.45+(1.4977*V2)+(	
1	0	0	4.61539	0.7517*CR2)	
0	0	0	10.0385		
0	1	0	5.73077		
0	0	0	9.57692		
0	0	0	7.36539		
1	0	0	8		
0	0	0	6.44231		
0	0	0	5		
0	0	0	10.75		
1	0	0	11.25		
1	0	0	4.57692		
1	0	0	5.98077		
0	0	0	8.71154		
0	0	0	11.1539		
1	0	0	4.44231		
0	0	0	7.75		
1	0	0	4.13462		
1	0	0	2.71154		
1	0	0	10.1346		
0	0	0	5.75		
0	0	0	11.5962		
0	0	0	2		
0	0	0	5.48077		
0	0	0	9.36539		
1	0	0	7.80769		
0	0	0	8.73077		
1	0	0	9.71154		

ENG 9:00 am

Generate Residuals



AutoSave Off | EAWE01 | Search | Nin Datu

File Home Insert Page Layout Formulas Data Review View Help | Comments | Share

Paste | Cut | Copy | Format Painter | Clipboard | Calibri | 11 | Font | Wrap Text | Merge & Center | Alignment | General | Number | Conditional Formatting | Format as Table | Normal | Bad | Good | Neutral | Calculation | Check Cell | Styles | Insert | Delete | Format | Cells | AutoSum | Fill | Clear | Sort & Filter | Find & Select | Editing | Add-ins | Add-ins

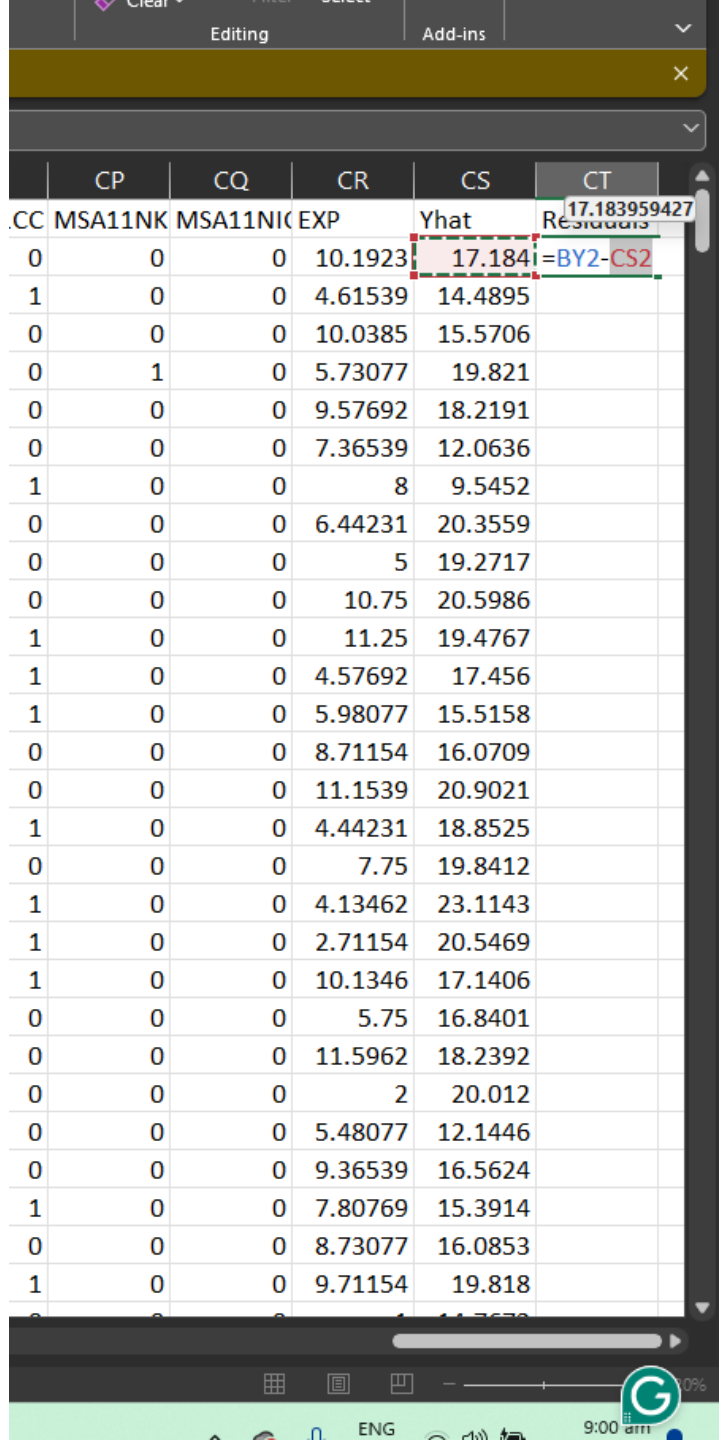
BACKUP THIS DOCUMENT Access this file anywhere with OneDrive included in your subscription. Schedule Backup Later

CT1 | Residuals

	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT
1	RS97UNKI	JOBS	EARNINGS	HOURS	TENURE	CATGOV	CATPRI	CATNPO	CATMIS	CATSE	COLLBARC	URBAN	REGNE	REGNC	REGW	REGS	MSA11NC	MSA11NC	MSA11CC	MSA11NK	MSA11NIC	EXP	Yhat	Residuals
2	0	6	20	40	0.65385	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	10.1923	15.6714	
3	0	6	7.65	33	0.94231	0	1	0	0	0	1	1	0	1	0	0	0	0	1	0	0	4.61539	16.7201	
4	0	9	17.44	20	5.07692	0	1	0	0	0	1	0	0	0	0	1	0	1	0	0	0	10.0385	14.6227	
5	0	3	22.6	40	4.59615	0	1	0	0	0	0	2	0	0	1	0	0	0	0	1	0	5.73077	19.8662	
6	0	10	13	48	2.90385	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	0	9.57692	16.7201	
7	0	11	8	30	0.36538	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	7.36539	13.574	
8	0		17	40	0.92308	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	0	8	11.4766	
9	0	5	13.5	45	5.01923	0	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	6.44231	19.8662	
10	0	4	19	40	4.5	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	5	19.8662	
11	0	5	41.2	45	3.75	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	10.75	17.7688	
12	0	18	12	41	0.28846	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0	11.25	16.7201	
13	0	10	10.25	40	2.46154	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0	0	4.57692	18.8175	
14	0	2	30	40	6.86539	0	0	0	1	0	1	1	0	1	0	0	0	0	1	0	0	5.98077	16.7201	
15	0	10	20.93	20	0.28846	0	1	0	0	1	0	1	0	0	0	1	0	1	0	0	0	8.71154	15.6714	
16	0	3	8.5	40	0.48077	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	11.1539	17.7688	
17	0	5	15.8	55	1.32692	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	0	4.44231	19.8662	
18	0	10	11.5	40	0.75	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	0	7.75	18.8175	
19	0	4	22.69	50	4.05769	1	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	4.13462	23.0123	
20	0	8	25.5	38	2.75	0	0	1	0	0	0	1	0	0	0	1	0	0	1	0	0	2.71154	21.9636	
21	0	9	14.36	40	1.59615	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0	10.1346	15.6714	
22	0	2	8	20	7.26923	0	1	0	0	1	0	1	0	0	0	1	0	1	0	0	0	5.75	17.7688	
23	0	2	14	40	9.57692	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	11.5962	15.6714	
24	0	9	22.31	50	3.73077	1	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	2	21.9636	
25	0	3	6.25	40	0.78846	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	5.48077	14.6227	
26	0	5	17	40	4.69231	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	9.36539	15.6714	
27	0	10	2.63	30	0.94231	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	0	7.80769	15.6714	
28	0	1	47	40	7.75	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	8.73077	15.6714	
29	0	7	26	40	0.59615	1	0	0	0	0	1	1	0	0	0	1	0	0	1	0	0	9.71154	17.7688	

EAWE01

Ready | Accessibility: Good to go | 120%


Editing
Add-ins
CP
CQ
CR
CS
CT
CC
MSA11NK
MSA11NI(
EXP
Yhat
17.183959427
=BY2-CS2
0 0 0 10.1923 17.184
1 0 0 4.61539 14.4895
0 0 0 10.0385 15.5706
0 1 0 5.73077 19.821
0 0 0 9.57692 18.2191
0 0 0 7.36539 12.0636
1 0 0 8 9.5452
0 0 0 6.44231 20.3559
0 0 0 5 19.2717
0 0 0 10.75 20.5986
1 0 0 11.25 19.4767
1 0 0 4.57692 17.456
1 0 0 5.98077 15.5158
0 0 0 8.71154 16.0709
0 0 0 11.1539 20.9021
1 0 0 4.44231 18.8525
0 0 0 7.75 19.8412
1 0 0 4.13462 23.1143
1 0 0 2.71154 20.5469
1 0 0 10.1346 17.1406
0 0 0 5.75 16.8401
0 0 0 11.5962 18.2392
0 0 0 2 20.012
0 0 0 5.48077 12.1446
0 0 0 9.36539 16.5624
1 0 0 7.80769 15.3914
0 0 0 8.73077 16.0853
1 0 0 9.71154 19.818
ENG
9:00 am

Importing file with residuals

Import file in R Studio

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function | Addins | Project: (None)

Untitled2* | GamingData | RCommander.R | .Rprofile | EAWE01

Filter | Cols: « < 1 - 50 > »

	ID	FEMALE	MALE	BYEAR	AGE	AGEMBTH	HHINC97	POVRAT97	HHBMBF	HHBMOF	HHOMBF	HHBMONLY	HHBFONLY	HHOT
1	618	0	1	1981	30	23	74100	396	1	0	0	0	0	
2	3253	0	1	1984	27	33	*NA*	*NA*	1	0	0	0	0	
3	537	0	1	1982	29	22	36960	231	0	0	0	1	0	
4	1367	0	1	1984	27	26	51512	324	1	0	0	0	0	

Showing 1 to 4 of 500 entries, 98 total columns

Console | Terminal | Background Jobs

R 4.3.1 · ~/

```
R version 4.3.1 (2023-06-16 ucrt) -- "Beagle Scouts"
Copyright (C) 2023 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

  Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

[Workspace loaded from ~/.RData]

> |
```

Environment | History | Connections | Tutorial

To Console | To Source

```
EAWE01 <- read_excel("EAWE01.xlsx")
View(EAWE01)
library(Rcmdr)
detach("package:Rcmdr", unload = TRUE)
library(Rcmdr)
detach("package:Rcmdr", unload = TRUE)
library(Rcmdr)
detach("package:Rcmdr", unload = TRUE)
library(Rcmdr)
library(Rcmdr)
library(readxl)
EAWE01 <- read_excel("EAWE01.xlsx")
View(EAWE01)
library(readxl)
EAWE01 <- read_excel("EAWE01.xlsx")
View(EAWE01)
```

Files | Plots | Packages | Help | Viewer | Presentation

New Folder | New Blank File | Delete | Rename | More

Home

Name	Size	Modified
NDD Adscientific.png	205.8 KB	Sep 5, 2023, 5:16 PM
NDD linkedin 1.png	38.9 KB	Sep 5, 2023, 5:30 PM
NDD linkedin.png	33.9 KB	Sep 5, 2023, 5:29 PM
Panel Data Regression Resources		
REIT Undergrad		
REITS		
Reits 10Sept2023.xlsx	12.6 KB	Sep 10, 2023, 4:38 PM
Reits 16Oct2023.xlsx	210.1 KB	Oct 16, 2023, 5:44 PM
Reits 17Sept2023.xlsx	24.3 KB	Sep 17, 2023, 12:32 AM
Reits 18Sept2023.xlsx	216.1 KB	Oct 28, 2023, 7:35 PM
RSI.xlsx	11.2 KB	Oct 28, 2023, 7:34 PM
Ryli R.docx	13.3 KB	Aug 28, 2023, 5:22 PM
SafeNet Sentinel		
Screen Recorder		
Special FInance Topic GEM		
SPSSInc		
Time Series Regression Resources		
Treeplot Transform Codes.txt	127 B	Oct 28, 2023, 7:36 PM
ViberD		
VUL		
Zoom		
EAWE01.xlsx	223.8 KB	Feb 3, 2024, 6:45 AM

View File
Import Dataset...

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function | Addins | Project: (None)

Untitled2* | GamingData | RCommander.R | .Rprofile | EAWE01

Environment | History | Connections | Tutorial

Import Excel Data

File/URL:

~/EAWE01.xlsx | Update

Data Preview:

ID (double)	FEMALE (double)	MALE (double)	BYEAR (double)	AGE (double)	AGEMBTH (double)	HHINC97 (double)	POVRAT97 (double)	HHBMBF (double)	HHBMOF (double)	HHOMBF (double)	HHBMONLY (double)	HHBFONLY (double)	HHOTHER (double)	MSA97NO (double)	MSA97NCC (double)
618	0	1	1981	30	23	74100	396	1	0	0	0	0	0	0	
3253	0	1	1984	27	33	NA	NA	1	0	0	0	0	0	0	
537	0	1	1982	29	22	36960	231	0	0	0	1	0	0	0	
1367	0	1	1984	27	26	51512	324	1	0	0	0	0	0	0	
4193	0	1	1982	29	23	974	6	0	0	0	1	0	0	0	
5611	0	1	1981	30	22	NA	NA	0	0	0	0	0	1	1	
5781	0	1	1980	31	20	1200	8	1	0	0	0	0	0	0	
2394	0	1	1982	29	28	NA	NA	1	0	0	0	0	0	0	
2941	0	1	1983	28	32	246474	1627	1	0	0	0	0	0	0	
1827	0	1	1982	29	32	109000	582	1	0	0	0	0	0	0	
5321	0	1	1980	31	29	NA	NA	0	1	0	0	0	0	1	
3247	0	1	1981	30	30	67300	351	1	0	0	0	0	0	0	
688	0	1	1982	29	26	NA	NA	0	1	0	0	0	0	0	
4668	0	1	1982	29	17	38000	203	1	0	0	0	0	0	0	
1323	0	1	1984	27	33	81265	368	1	0	0	0	0	0	0	
3643	0	1	1984	27	34	72000	453	1	0	0	0	0	0	0	
5986	0	1	1981	30	18	39000	166	1	0	0	0	0	0	0	
89	0	1	1981	30	15	NA	NA	1	0	0	0	0	0	0	
4457	0	1	1983	28	26	87000	547	1	0	0	0	0	0	0	
8907	0	1	1981	30	27	35000	187	1	0	0	0	0	0	0	

Previewing first 50 entries.

Import Options:

Name: EAWE01 | Max Rows:

Sheet: Default | Skip: 0

Range: A1:D10 | NA:

☑ First Row as Names

☑ Open Data Viewer

Code Preview:

```
library(readxl)
EAWE01 <- read_excel("EAWE01.xlsx")
View(EAWE01)
```

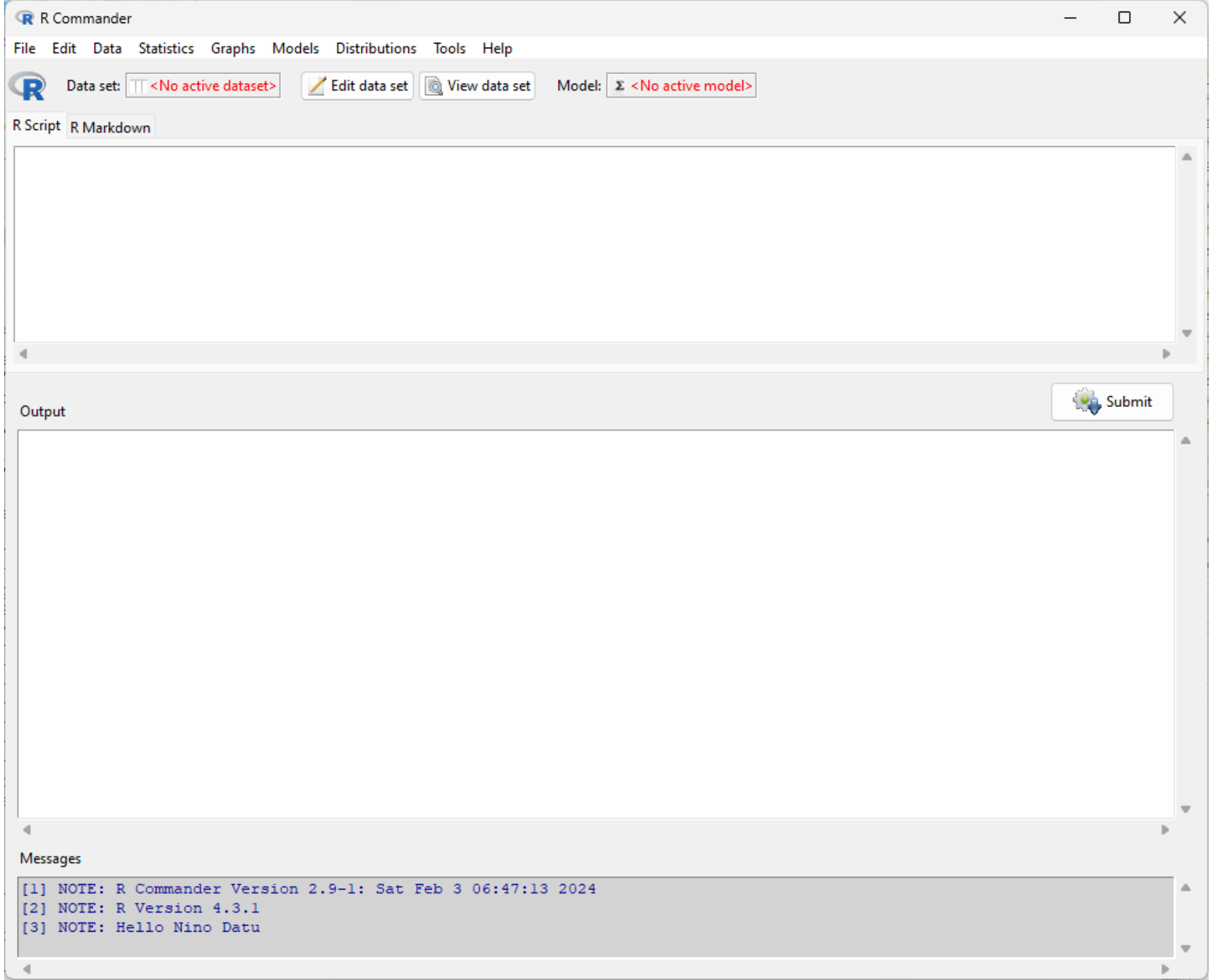
Reading Excel files using readxl

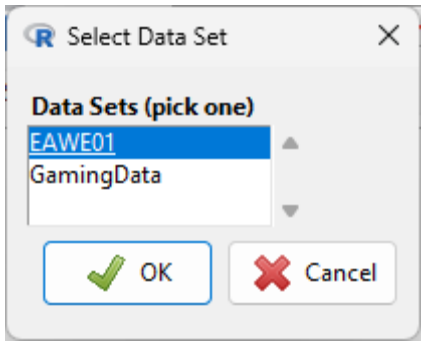
Import | Cancel

Zoom

EAWE01.xlsx 223.8 KB Feb 3, 2024, 6:45 AM

Import file in R Commander


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: <No active dataset>
Edit data set
View data set
Model: Σ <No active model>
R Script
R Markdown
Output
Submit
Messages
[1] NOTE: R Commander Version 2.9-1: Sat Feb 3 06:47:13 2024
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu


Select Data Set
Data Sets (pick one)
EAWE01
GamingData
OK
Cancel

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: <No active model>

R Script | R Markdown

```
RegModel.1 <- lm(EARNINGS~S, data=EAWE01)
summary(RegModel.1)
```

Submit

Output

```
Call:
lm(formula = EARNINGS ~ S, data = EAWE01)

Residuals:
    Min      1Q  Median      3Q     Max
-17.177  -6.588  -2.147   3.532  86.424

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   3.0897     2.4638   1.254     0.21
S             1.0487     0.1664   6.304 6.41e-10 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10.33 on 498 degrees of freedom
Multiple R-squared:  0.0739, Adjusted R-squared:  0.07204
F-statistic: 39.74 on 1 and 498 DF,  p-value: 6.407e-10
```

Messages

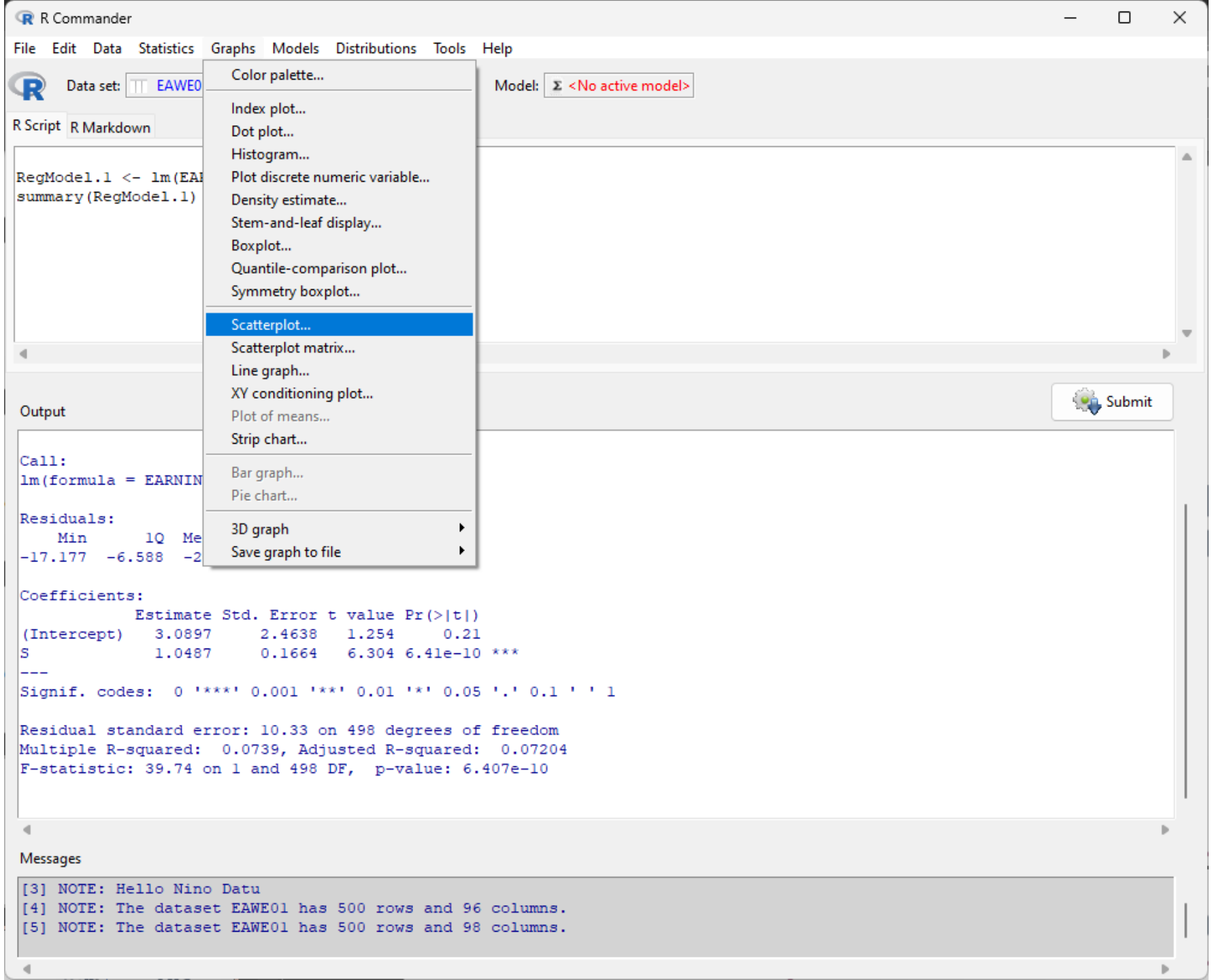
```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 96 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```

EAWE01

	REGW	REGS	MSA11NO	MSA11NCC	MSA11CC	MSA11NK	MSA11NIC	EXP	Yhat	Residuals
1	0	1	0	1	0	0	0	10.1923100	15.6714	4.3286
2	0	0	0	0	1	0	0	4.6153850	16.7201	-9.0701
3	0	1	0	1	0	0	0	10.0384600	14.6227	2.8173
4	1	0	0	0	0	1	0	5.7307690	19.8662	2.7338
5	1	0	0	1	0	0	0	9.5769230	16.7201	-3.7201
6	1	0	1	0	0	0	0	7.3653850	13.5740	-5.5740
7	1	0	0	0	1	0	0	8.0000000	11.4766	5.5234
8	0	0	0	1	0	0	0	6.4423070	19.8662	-6.3662
9	0	0	0	1	0	0	0	5.0000000	19.8662	-0.8662
10	0	0	0	1	0	0	0	10.7500000	17.7688	23.4312
11	0	1	0	0	1	0	0	11.2500000	16.7201	-4.7201
12	0	0	0	0	1	0	0	4.5769230	18.8175	-8.5675
13	0	0	0	0	1	0	0	5.9807690	16.7201	13.2799
14	0	1	0	1	0	0	0	8.7115380	15.6714	5.2586
15	0	0	0	1	0	0	0	11.1538500	17.7688	-9.2688
16	1	0	0	0	1	0	0	4.4423070	19.8662	-4.0662
17	1	0	0	1	0	0	0	7.7500000	18.8175	-7.3175
18	0	0	0	0	1	0	0	4.1346150	23.0123	-0.3223
19	0	1	0	0	1	0	0	2.7115390	21.9636	3.5364
20	0	1	0	0	1	0	0	10.1346100	15.6714	-1.3114
21	0	1	0	1	0	0	0	5.7500000	17.7688	-9.7688
22	1	0	0	1	0	0	0	11.5961500	15.6714	-1.6714
23	0	0	0	1	0	0	0	2.0000000	21.9636	0.3464
24	1	0	1	0	0	0	0	5.4807690	14.6227	-8.3727
25	1	0	0	1	0	0	0	9.3653850	15.6714	1.3286
26	1	0	0	0	1	0	0	7.8076930	15.6714	-13.0414
27	0	0	0	1	0	0	0	8.7307690	15.6714	31.3286
28	0	1	0	0	1	0	0	9.7115380	17.7688	8.2312
29	1	0	0	1	0	0	0	1.0000000	18.8175	1.8525
30	0	0	0	0	1	0	0	9.7115380	18.8175	-16.6875

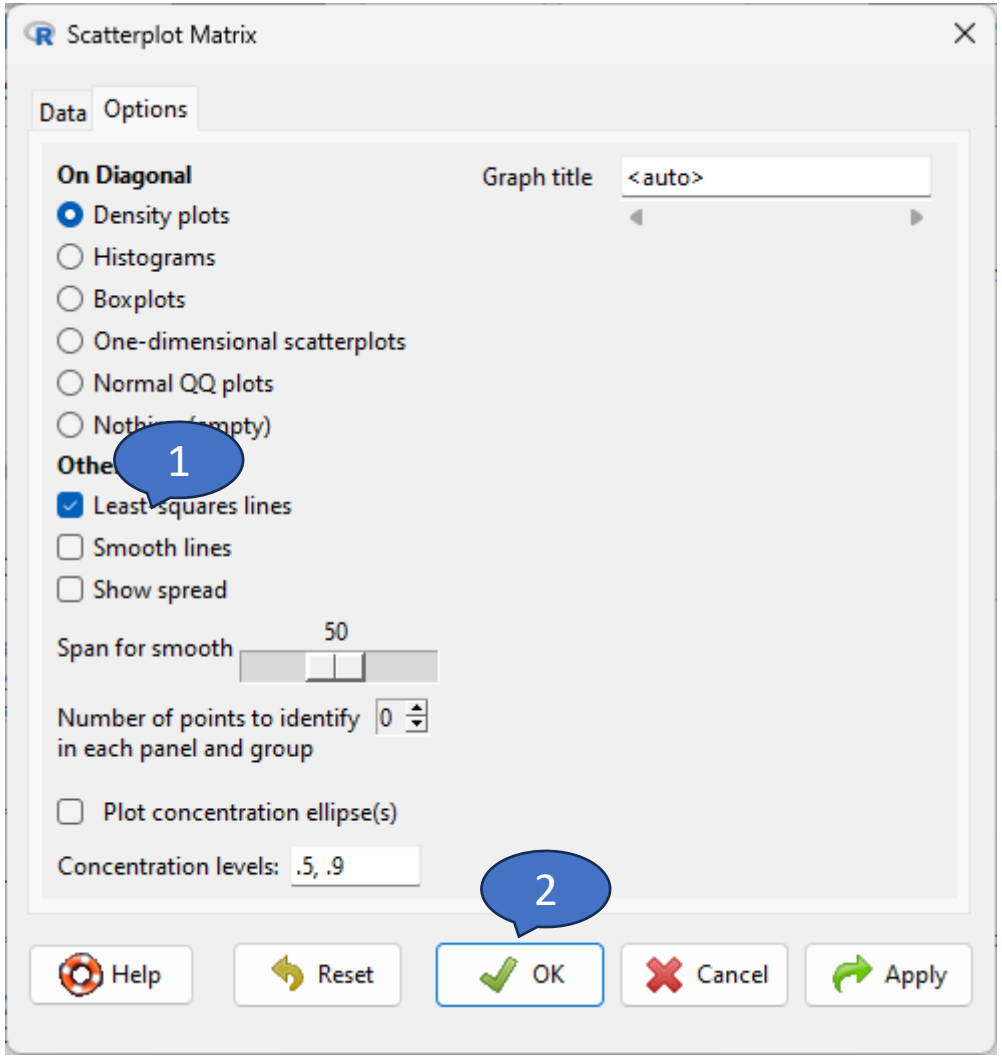
Regression Diagnostics: L. I. N. E.

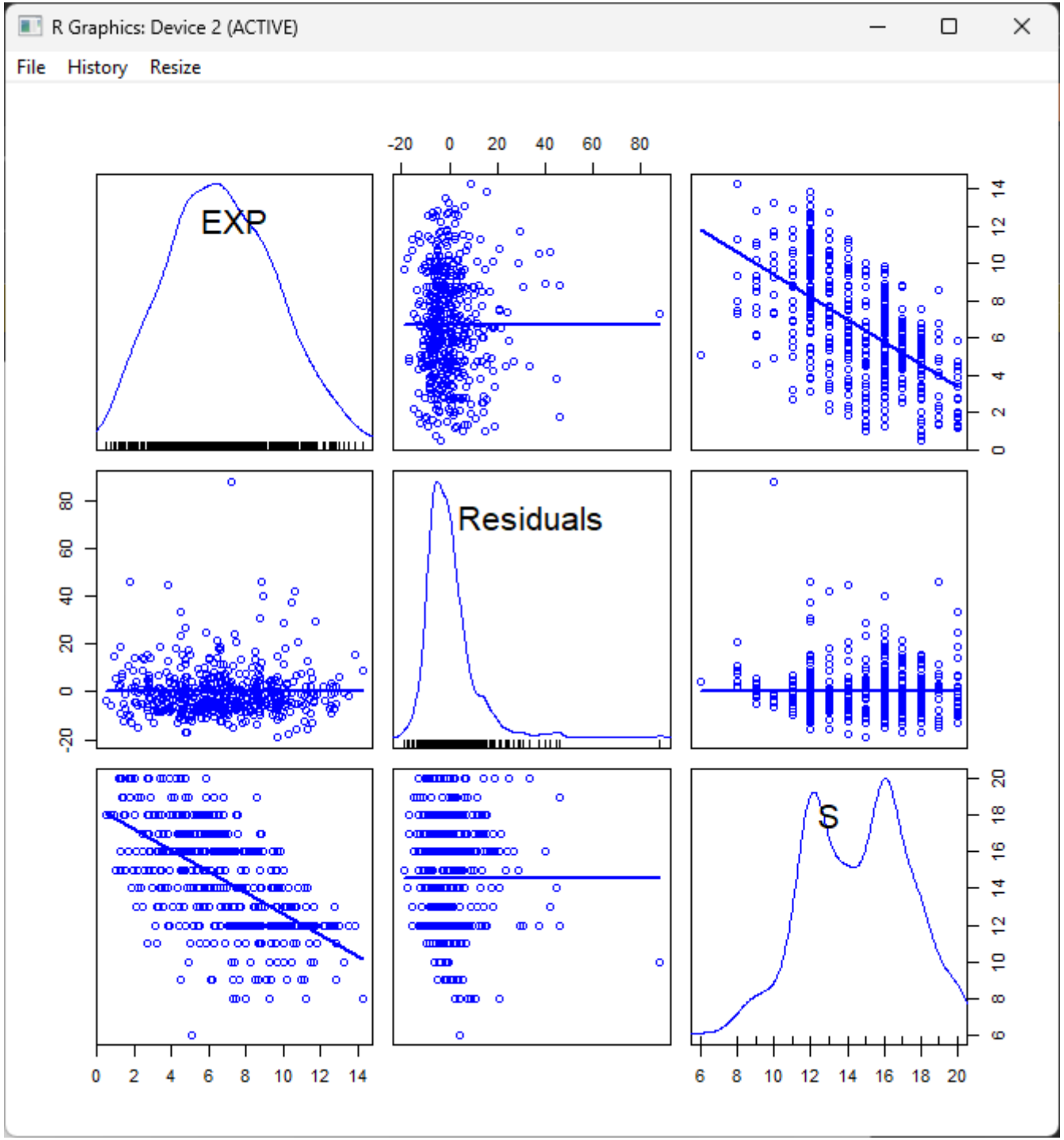
Diagnostics: Linearity of Residuals


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: EAWE0
Model: Σ <No active model>
R Script R Markdown
RegModel.1 <- lm(EAI
summary(RegModel.1)
Color palette...
Index plot...
Dot plot...
Histogram...
Plot discrete numeric variable...
Density estimate...
Stem-and-leaf display...
Boxplot...
Quantile-comparison plot...
Symmetry boxplot...
Scatterplot...
Scatterplot matrix...
Line graph...
XY conditioning plot...
Plot of means...
Strip chart...
Bar graph...
Pie chart...
3D graph
Save graph to file
Submit
Output
Call:
lm(formula = EARNIN
Residuals:
Min 1Q Me
-17.177 -6.588 -2
Coefficients:
Estimate Std. Error t value Pr(>|t|)
(Intercept) 3.0897 2.4638 1.254 0.21
S 1.0487 0.1664 6.304 6.41e-10 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 10.33 on 498 degrees of freedom
Multiple R-squared: 0.0739, Adjusted R-squared: 0.07204
F-statistic: 39.74 on 1 and 498 DF, p-value: 6.407e-10
Messages
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 96 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.

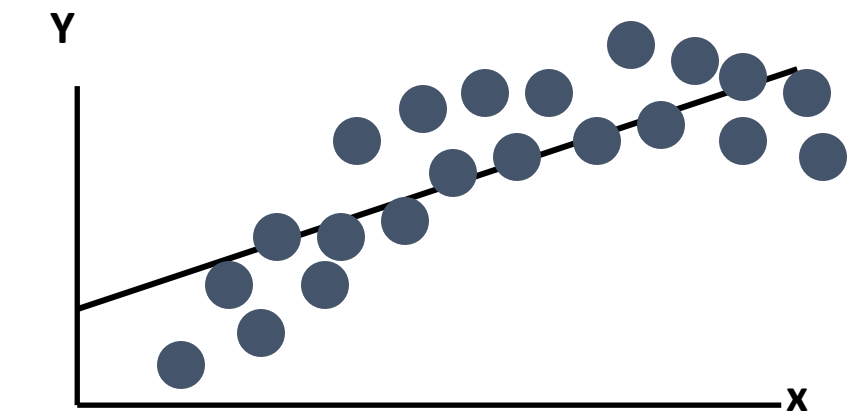

Scatte atrix
2
Data
Options
1
Select variables (thre
ETHBLACK
ETHHISP
ETHWHITE
EXP
FAITHC
FAITHJ
Plot by groups...
Subset expression
<all valid cases>
Help
Reset
OK
Cancel
Apply

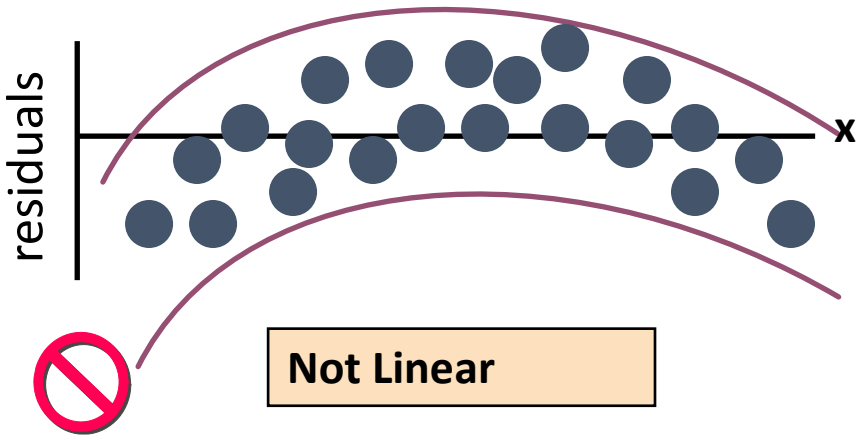

Scatterplot Matrix
Data
Options
On Diagonal
Density plots
Histograms
Boxplots
One-dimensional scatterplots
Normal QQ plots
Graph title
<auto>
1
Least-squares lines
Smooth lines
Show spread
Span for smooth
50
Number of points to identify in each panel and group
0
Plot concentration ellipse(s)
Concentration levels:
.5, .9
2
Help
Reset
OK
Cancel
Apply


R Graphics: Device 2 (ACTIVE)
File
History
Resize
EXP
Residuals
S

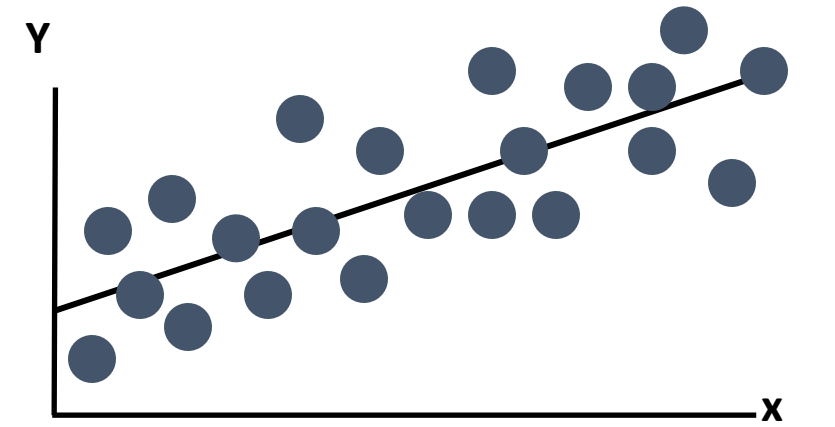
Residual Analysis for Linearity

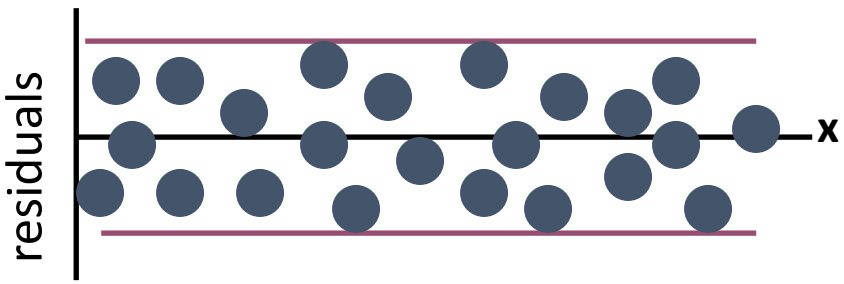
DCOVA





Not Linear



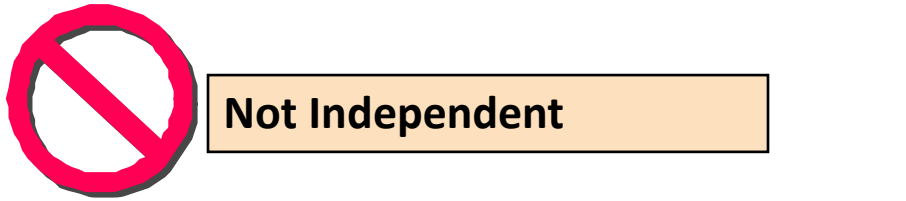


Linear

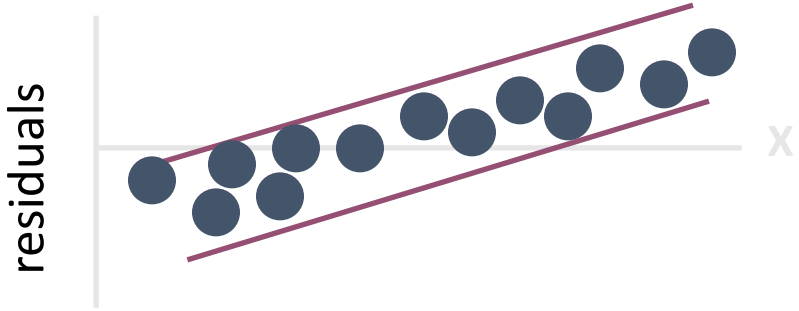
Diagnostics: Independence of Residuals

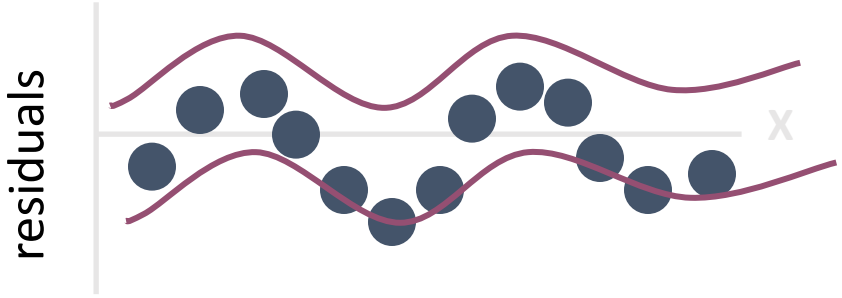
Residual Analysis for Independence

DCOVA

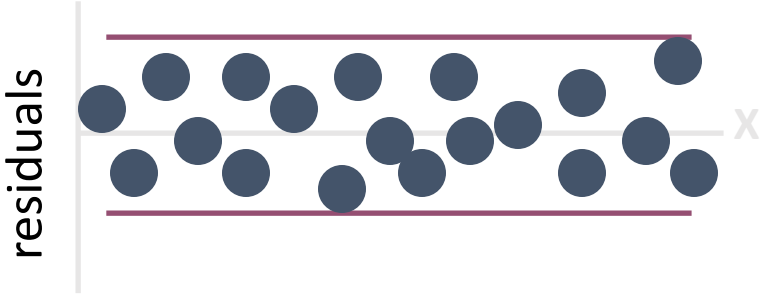


Not Independent





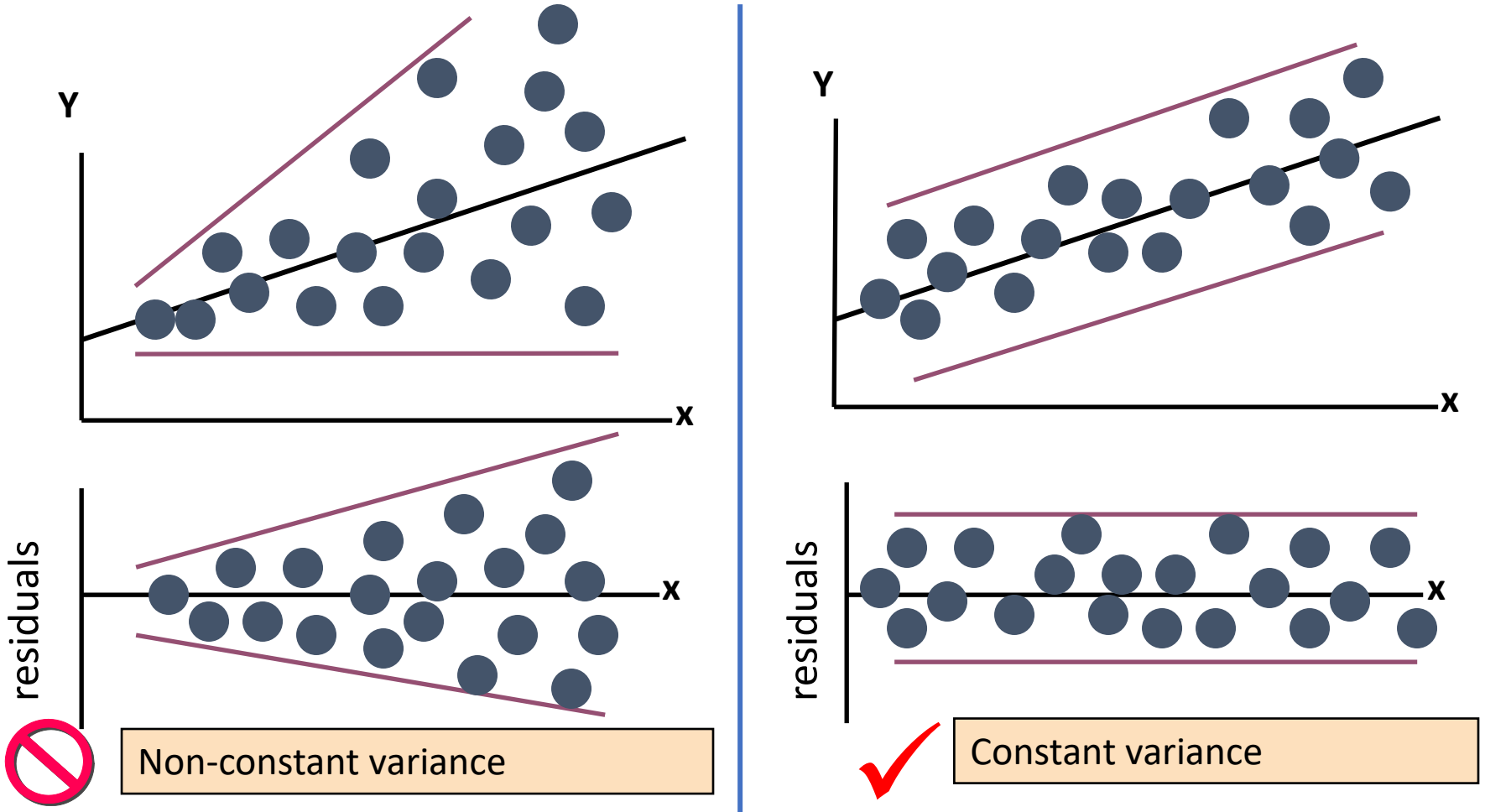
Independent



Diagnostics: Equal Variance of Residuals

Residual Analysis for Equal Variance

DCOVA



R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: <No active model>

R Script | R Markdown

```
RegModel.1 <- lm(EARNINGS~S, data=EAWE01)
summary(RegModel.1)
scatterplot(Residuals~S, regLine=FALSE, smooth=FALSE, boxplots=FALSE, data=EAWE01)
scatterplot(Residuals~S, regLine=TRUE, smooth=FALSE, id=list(method='mahal', n=2), boxplots=FALSE, data=EAWE01)
scatterplot(Residuals~S, regLine=TRUE, smooth=FALSE, id=list(method='mahal', n=2), boxplots=FALSE, data=EAWE01)
with(EAWE01, Hist(Residuals, scale="frequency", breaks="Sturges", col="darkgray"))
with(EAWE01, Hist(Residuals, scale="percent", breaks="Sturges", col="darkgray"))
with(EAWE01, Dotplot(Residuals, bin=FALSE))
```

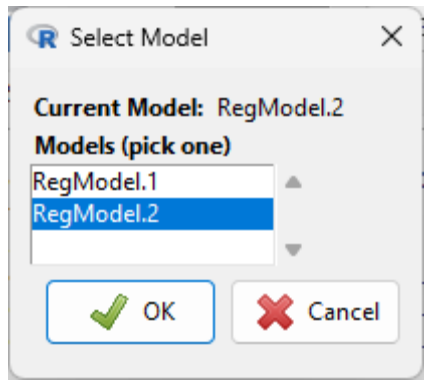
Submit

Output

```
Call:
lm(formula = EARNINGS ~ S, data = EAWE01)

Residuals:
    Min      1Q  Median      3Q     Max
-17.177  -6.588  -2.147   3.532  86.424

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   3.0897     2.4638   1.254     0.21
S             1.0487     0.1664   6.304 6.41e-10 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10.33 on 498 degrees of freedom
Multiple R-squared:  0.0739, Adjusted R-squared:  0.07204
F-statistic: 39.74 on 1 and 498 DF,  p-value: 6.407e-10
```

Messages

```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 96 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```


Select Model
Current Model: RegModel.2
Models (pick one)
RegModel.1
RegModel.2
OK
Cancel

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.2

R Script | R Markdown

```
RegModel.2 <- lm(EARNINGS~EXP+S, data=EAWE01)
summary(RegModel.2)
vif(RegModel.2)
round(cov2cor(vcov(RegModel.2)), 3) # Correlations of parameter estimates
scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)
scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)
```

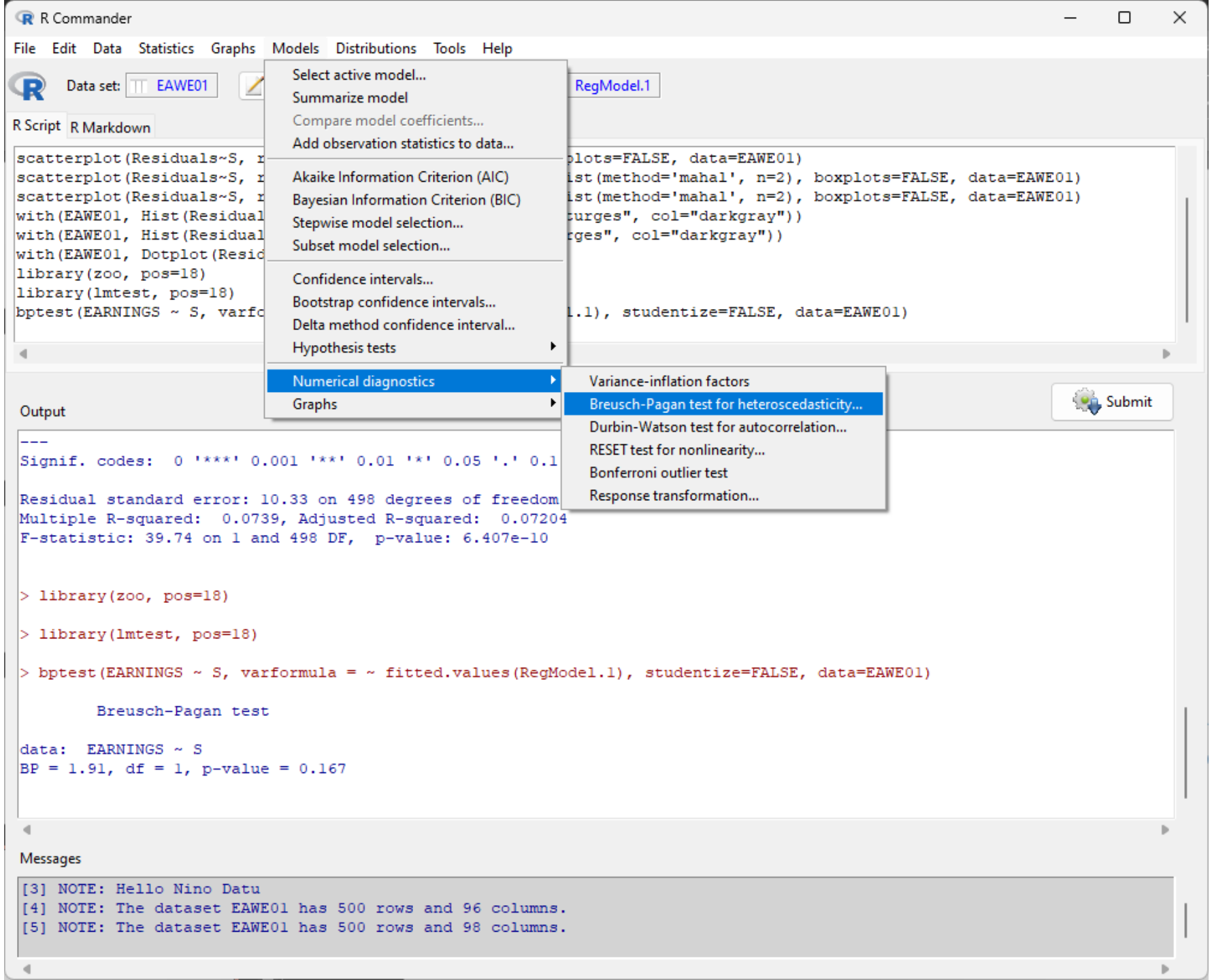
Submit

Output

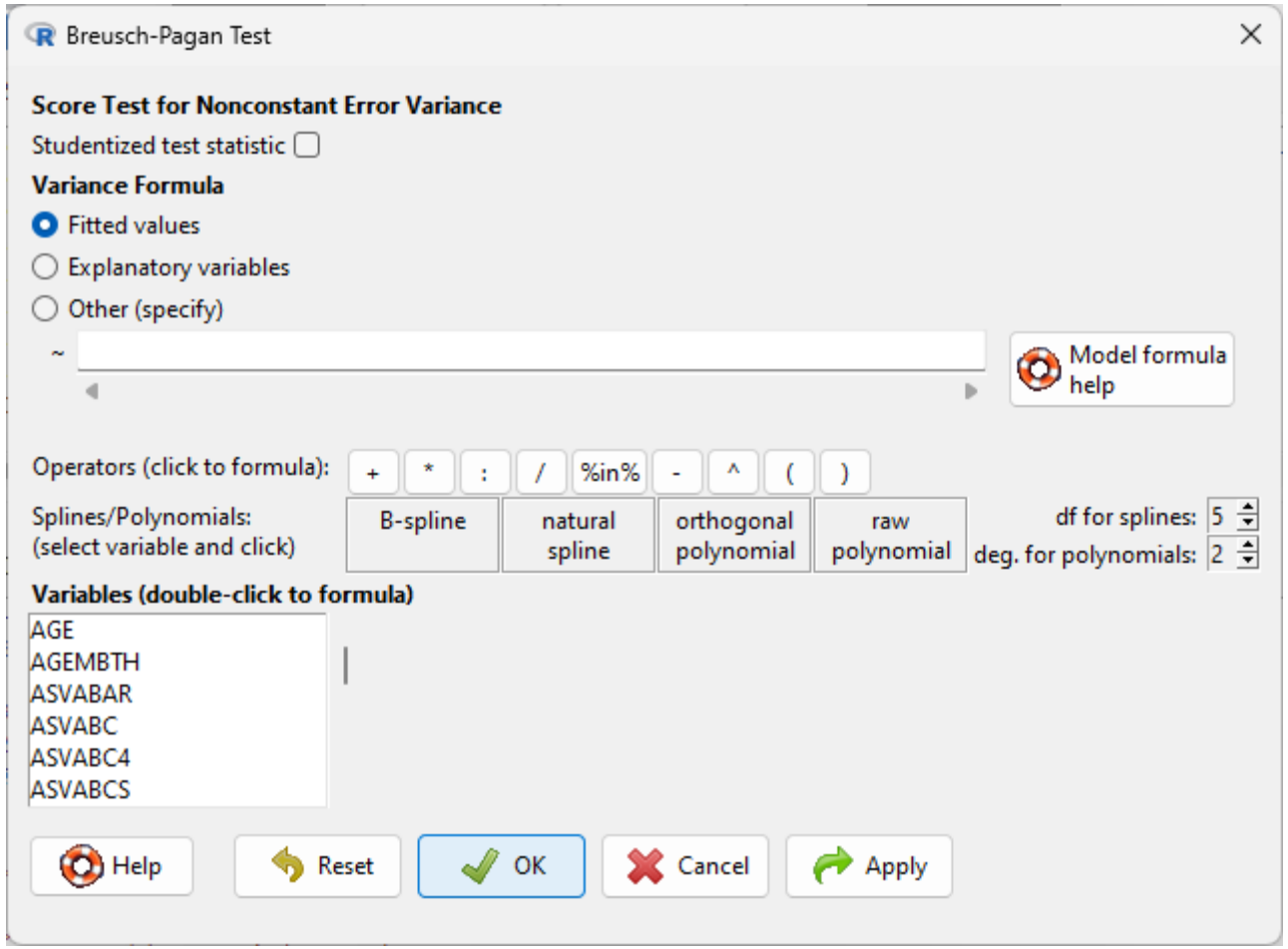
```
Residual standard error: 10.2 on 497 degrees of freedom
Multiple R-squared:  0.09973, Adjusted R-squared:  0.09611
F-statistic: 27.53 on 2 and 497 DF,  p-value: 4.582e-12


> vif(RegModel.2)
     EXP        S
1.524359 1.524359

> round(cov2cor(vcov(RegModel.2)), 3) # Correlations of parameter estimates
            (Intercept)    EXP      S
(Intercept)       1.000 -0.782 -0.954
EXP              -0.782  1.000  0.587
S                -0.954  0.587  1.000

> scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)

> scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)
```

Messages

```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: EAWE01
RegModel.1
R Script R Markdown
scatterplot(Residuals~S, r
scatterplot(Residuals~S, r
scatterplot(Residuals~S, r
with(EAWE01, Hist(Residual
with(EAWE01, Hist(Residual
with(EAWE01, Dotplot(Resid
library(zoo, pos=18)
library(lmtest, pos=18)
bptest(EARNINGS ~ S, varfo
plots=FALSE, data=EAWE01)
ist(method='mahal', n=2), boxplots=FALSE, data=EAWE01)
ist(method='mahal', n=2), boxplots=FALSE, data=EAWE01)
turges", col="darkgray"))
rges", col="darkgray"))
l.1), studentize=FALSE, data=EAWE01)
Select active model...
Summarize model
Compare model coefficients...
Add observation statistics to data...
Akaike Information Criterion (AIC)
Bayesian Information Criterion (BIC)
Stepwise model selection...
Subset model selection...
Confidence intervals...
Bootstrap confidence intervals...
Delta method confidence interval...
Hypothesis tests
Numerical diagnostics
Graphs
Variance-inflation factors
Breusch-Pagan test for heteroscedasticity...
Durbin-Watson test for autocorrelation...
RESET test for nonlinearity...
Bonferroni outlier test
Response transformation...
Submit
Output

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1
Residual standard error: 10.33 on 498 degrees of freedom
Multiple R-squared: 0.0739, Adjusted R-squared: 0.07204
F-statistic: 39.74 on 1 and 498 DF, p-value: 6.407e-10
> library(zoo, pos=18)
> library(lmtest, pos=18)
> bptest(EARNINGS ~ S, varformula = ~ fitted.values(RegModel.1), studentize=FALSE, data=EAWE01)
Breusch-Pagan test
data: EARNINGS ~ S
BP = 1.91, df = 1, p-value = 0.167
Messages
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 96 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.


Breusch-Pagan Test
Score Test for Nonconstant Error Variance
Studentized test statistic
Variance Formula
Fitted values
Explanatory variables
Other (specify)
~
Model formula help
Operators (click to formula):
+
*
:
/
%in%
-
^
(
)
Splines/Polynomials:
(select variable and click)
B-spline
natural spline
orthogonal polynomial
raw polynomial
df for splines:
5
deg. for polynomials:
2
Variables (double-click to formula)
AGE
AGEMBTH
ASVABAR
ASVABC
ASVABC4
ASVABCS
Help
Reset
OK
Cancel
Apply

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.2

R Script | R Markdown

```
RegModel.2 <- lm(EARNINGS~EXP+S, data=EAWE01)
summary(RegModel.2)
vif(RegModel.2)
round(cov2cor(vcov(RegModel.2)), 3) # Correlations of parameter estimates
scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)
scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)
bptest(EARNINGS ~ EXP + S, varformula = ~ fitted.values(RegModel.2), studentize=FALSE, data=EAWE01)
```

Submit

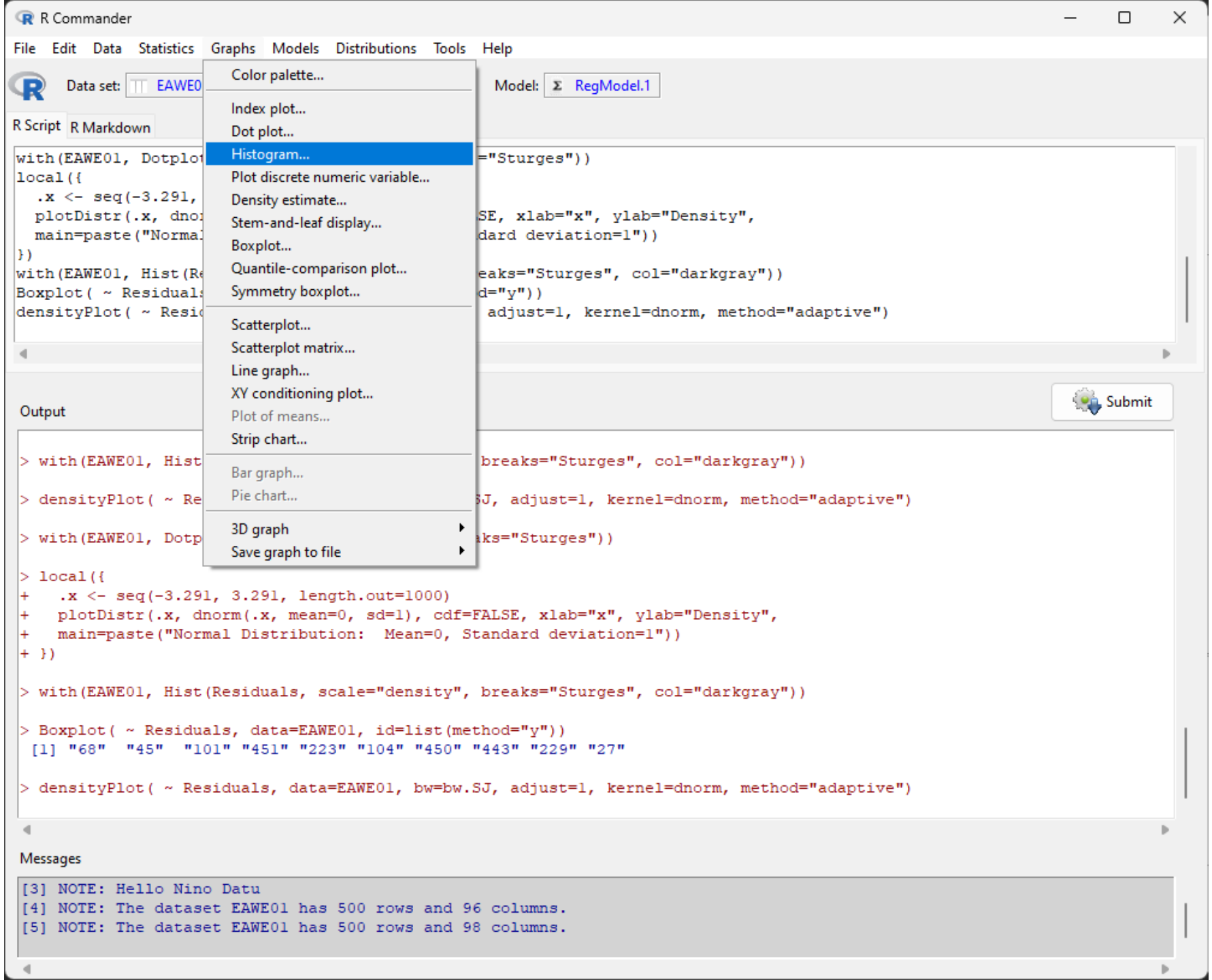
Output

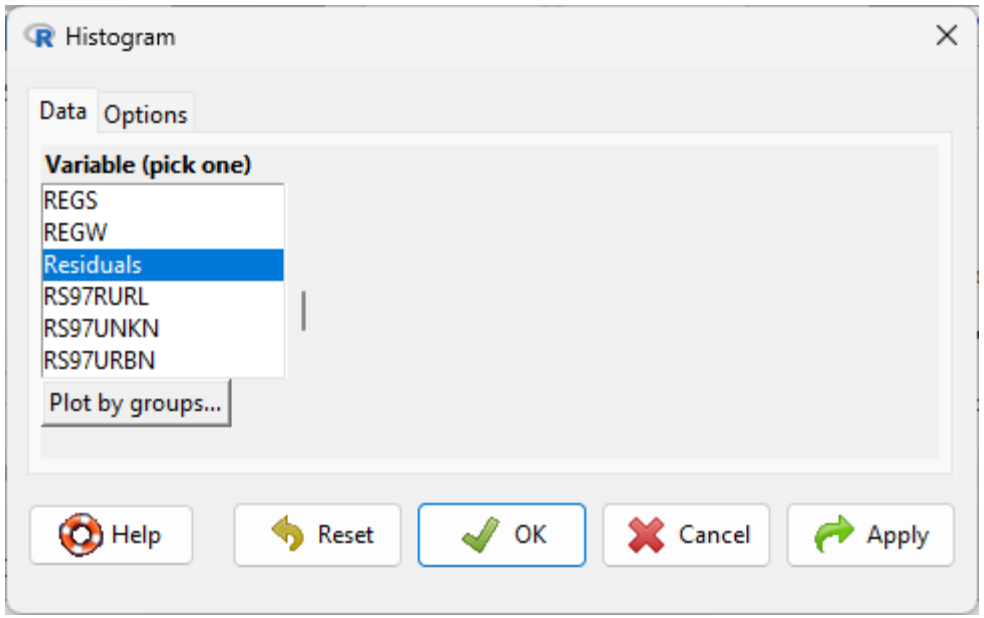
```
1.524359 1.524359

> round(cov2cor(vcov(RegModel.2)), 3) # Correlations of parameter estimates
            (Intercept)    EXP      S
(Intercept)       1.000 -0.782 -0.954
EXP              -0.782  1.000  0.587
S                -0.954  0.587  1.000

> scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)

> scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)

> bptest(EARNINGS ~ EXP + S, varformula = ~ fitted.values(RegModel.2), studentize=FALSE, data=EAWE01)

        Breusch-Pagan test

data:  EARNINGS ~ EXP + S
BP = 1.2703, df = 1, p-value = 0.2597
```

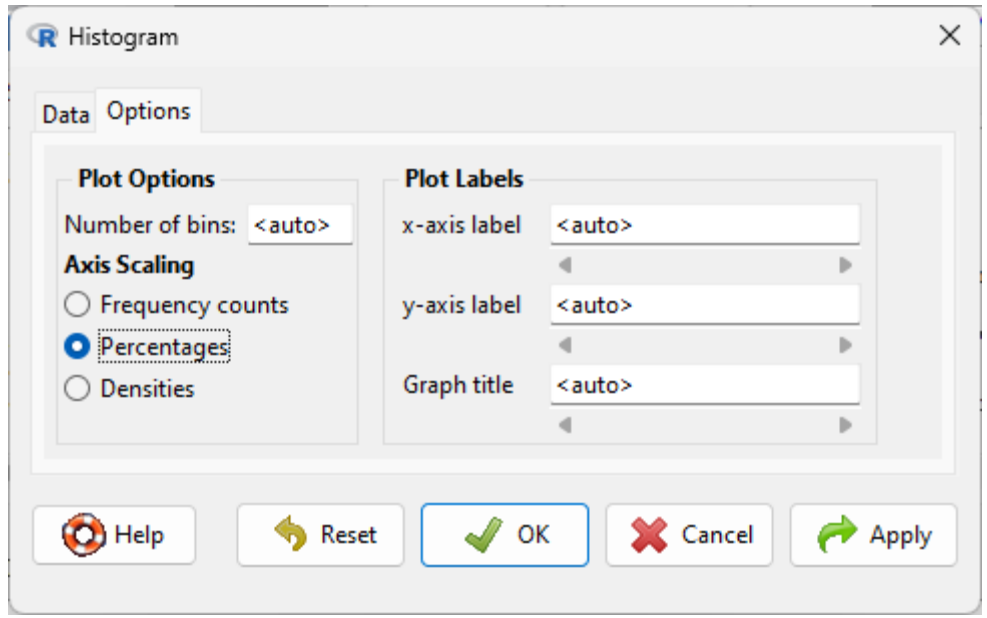
Messages

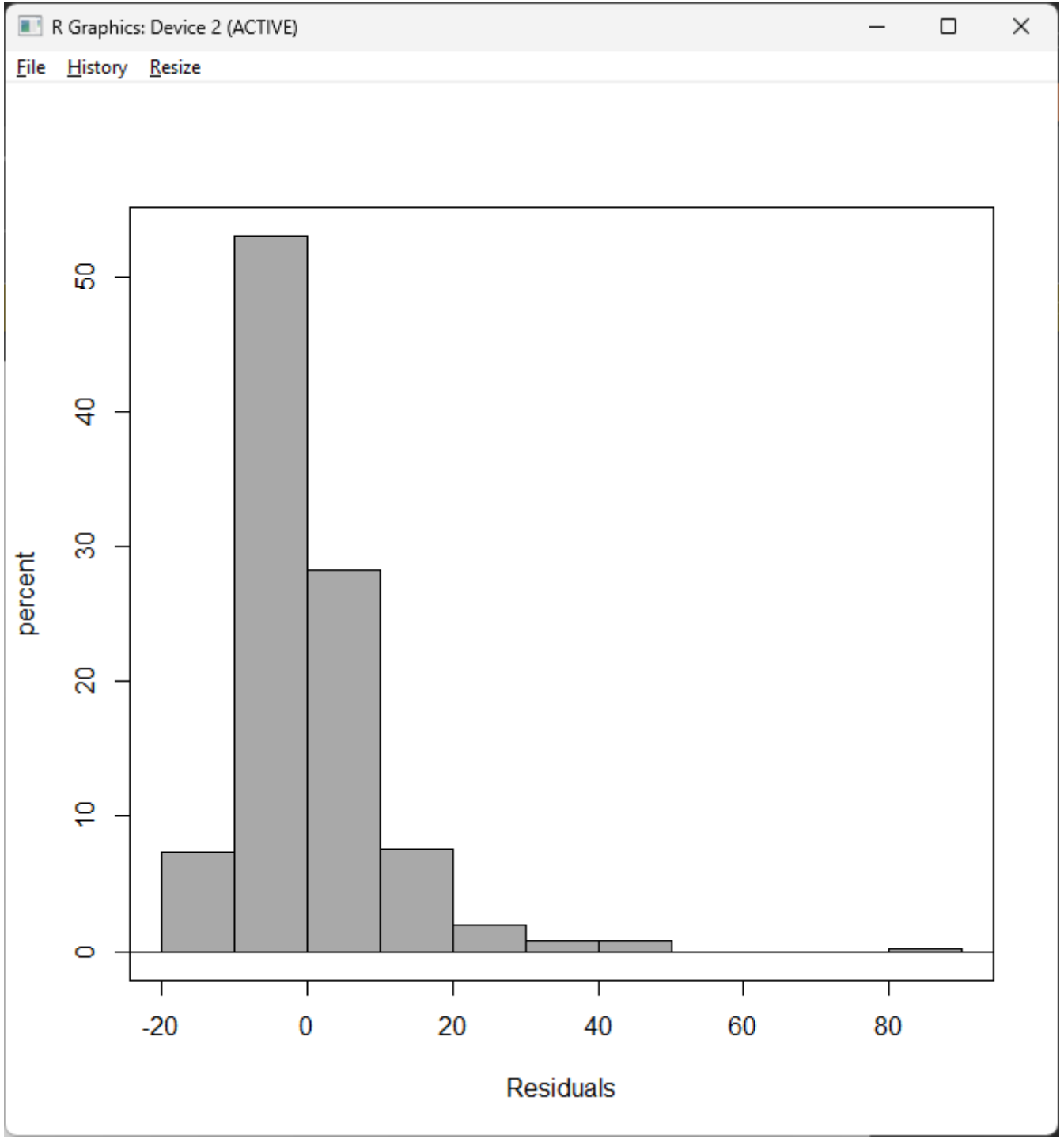
```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```

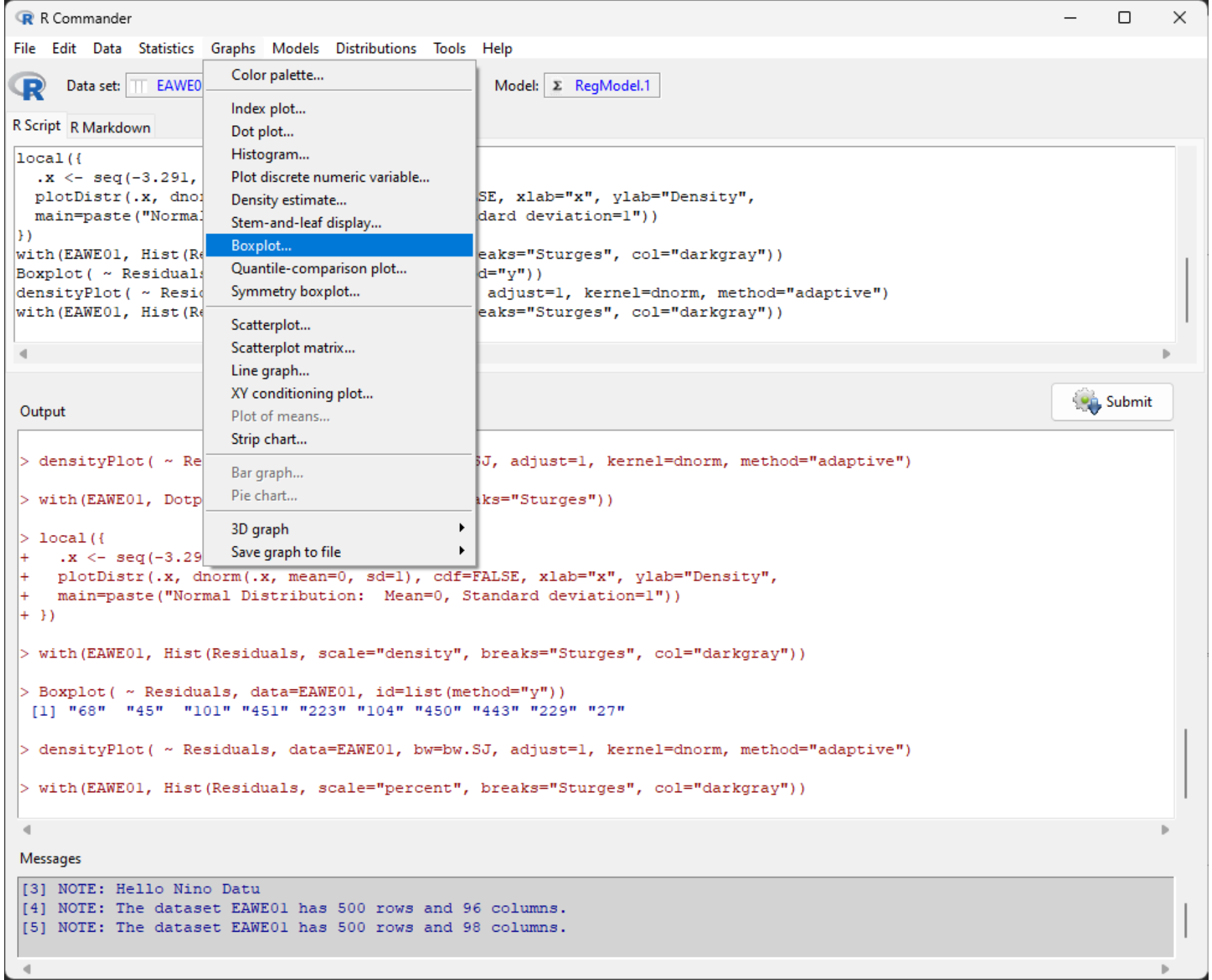
Diagnostics: Normality of Residuals

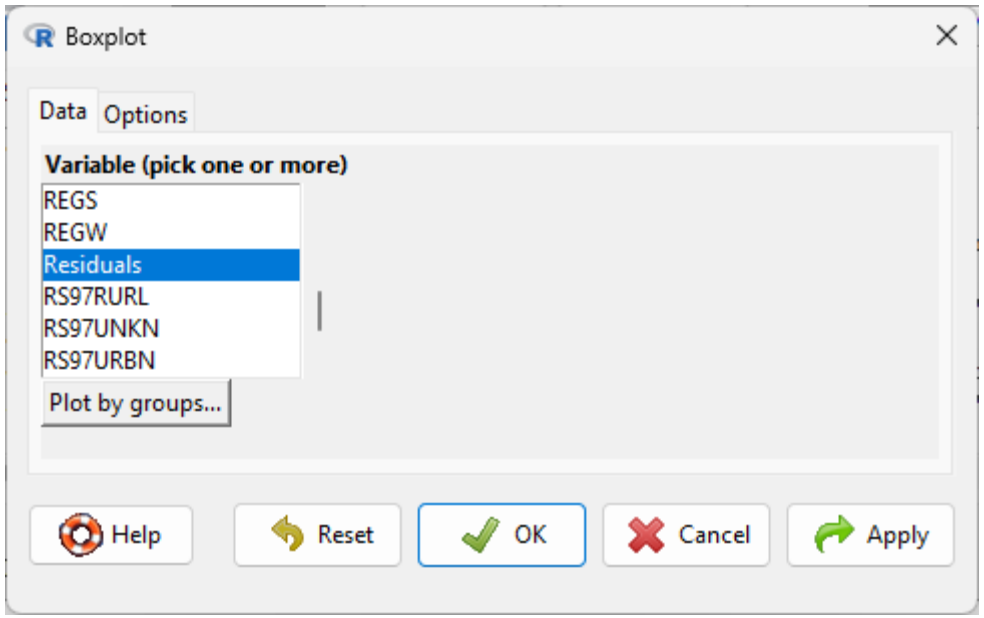

R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Color palette...
Index plot...
Dot plot...
Histogram...
Plot discrete numeric variable...
Density estimate...
Stem-and-leaf display...
Boxplot...
Quantile-comparison plot...
Symmetry boxplot...
Scatterplot...
Scatterplot matrix...
Line graph...
XY conditioning plot...
Plot of means...
Strip chart...
Bar graph...
Pie chart...
3D graph
Save graph to file
Data set: EAWE0
Model: RegModel.1
R Script R Markdown
with(EAWE01, Dotplot
local({
.x <- seq(-3.291,
plotDistr(.x, dno
main=paste("Normal
})
with(EAWE01, Hist(Re
Boxplot(~ Residuals
densityPlot(~ Resid
="Sturges"))
SE, xlab="x", ylab="Density",
dard deviation=1"))
eaks="Sturges", col="darkgray"))
d="y"))
adjust=1, kernel=dnorm, method="adaptive")
Output
Submit
> with(EAWE01, Hist
breaks="Sturges", col="darkgray"))
> densityPlot(~ Re
SJ, adjust=1, kernel=dnorm, method="adaptive")
> with(EAWE01, Dotp
ks="Sturges"))
> local({
+ .x <- seq(-3.291, 3.291, length.out=1000)
+ plotDistr(.x, dnorm(.x, mean=0, sd=1), cdf=FALSE, xlab="x", ylab="Density",
+ main=paste("Normal Distribution: Mean=0, Standard deviation=1"))
+ })
> with(EAWE01, Hist(Residuals, scale="density", breaks="Sturges", col="darkgray"))
> Boxplot(~ Residuals, data=EAWE01, id=list(method="y"))
[1] "68" "45" "101" "451" "223" "104" "450" "443" "229" "27"
> densityPlot(~ Residuals, data=EAWE01, bw=bw.SJ, adjust=1, kernel=dnorm, method="adaptive")
Messages
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 96 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.

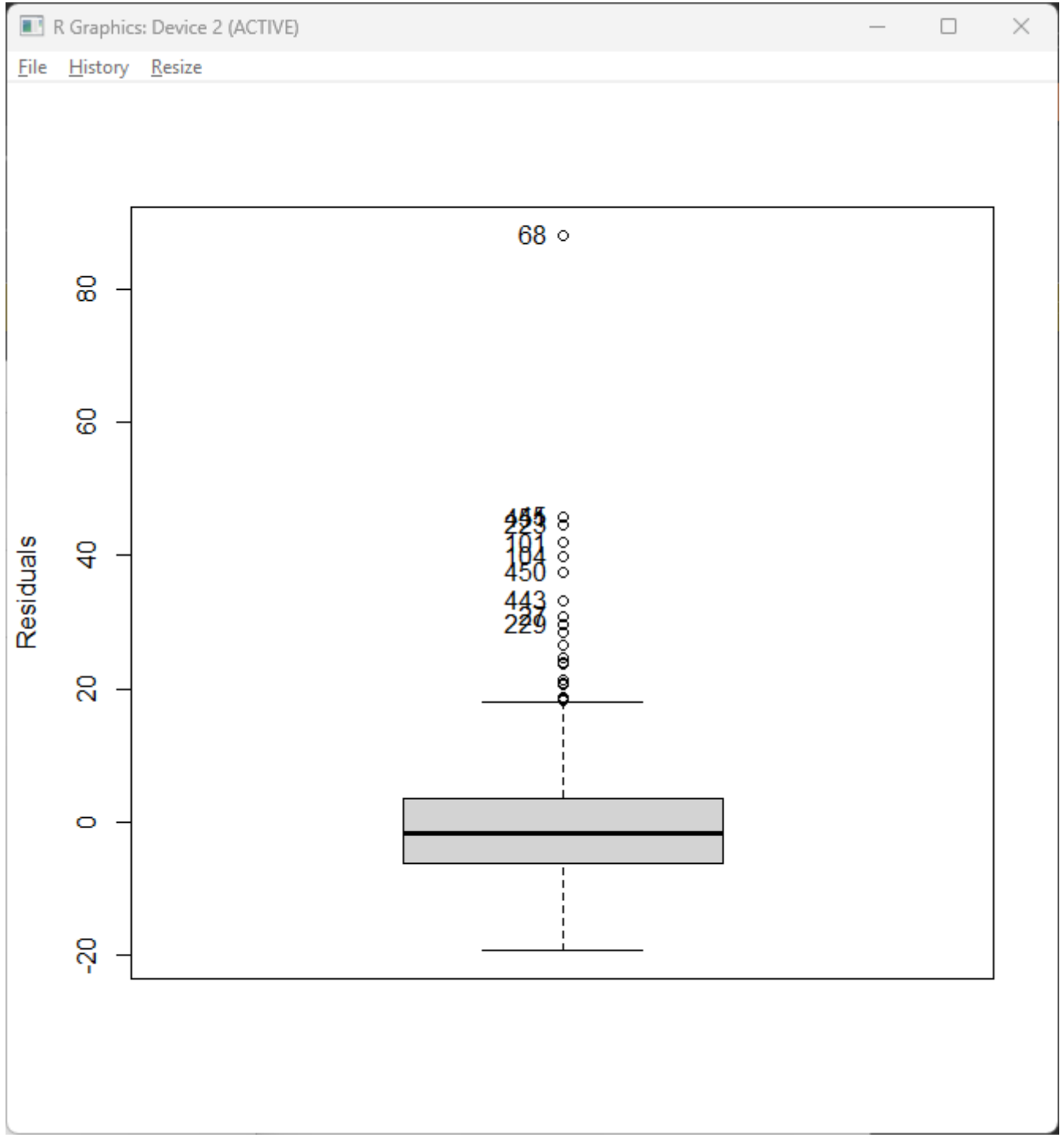

Histogram
Data
Options
Variable (pick one)
REGS
REGW
Residuals
RS97RURL
RS97UNKN
RS97URBN
Plot by groups...
Help
Reset
OK
Cancel
Apply

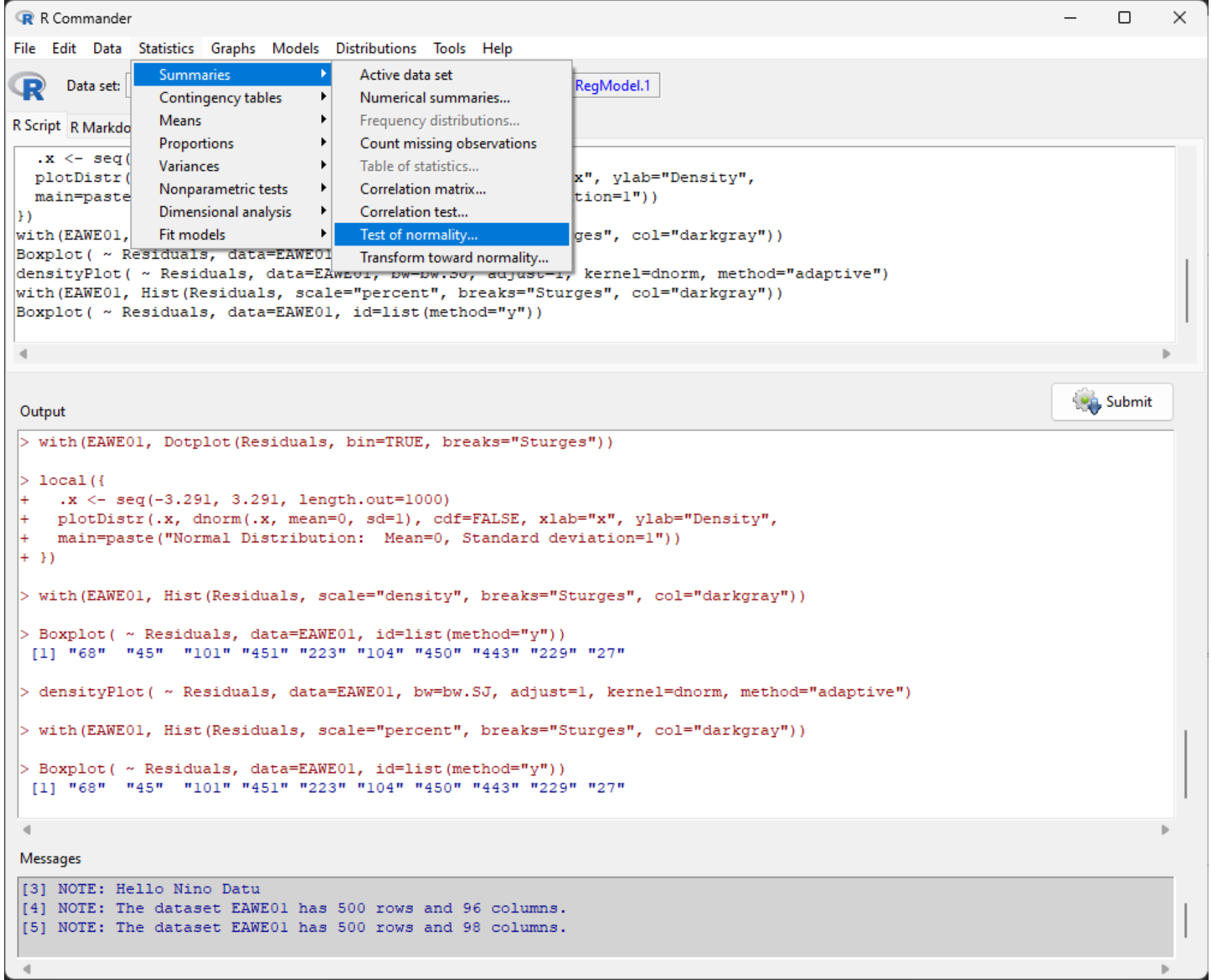

Histogram
Data
Options
Plot Options
Number of bins:
<auto>
Axis Scaling
Frequency counts
Percentages
Densities
Plot Labels
x-axis label
<auto>
y-axis label
<auto>
Graph title
<auto>
Help
Reset
OK
Cancel
Apply

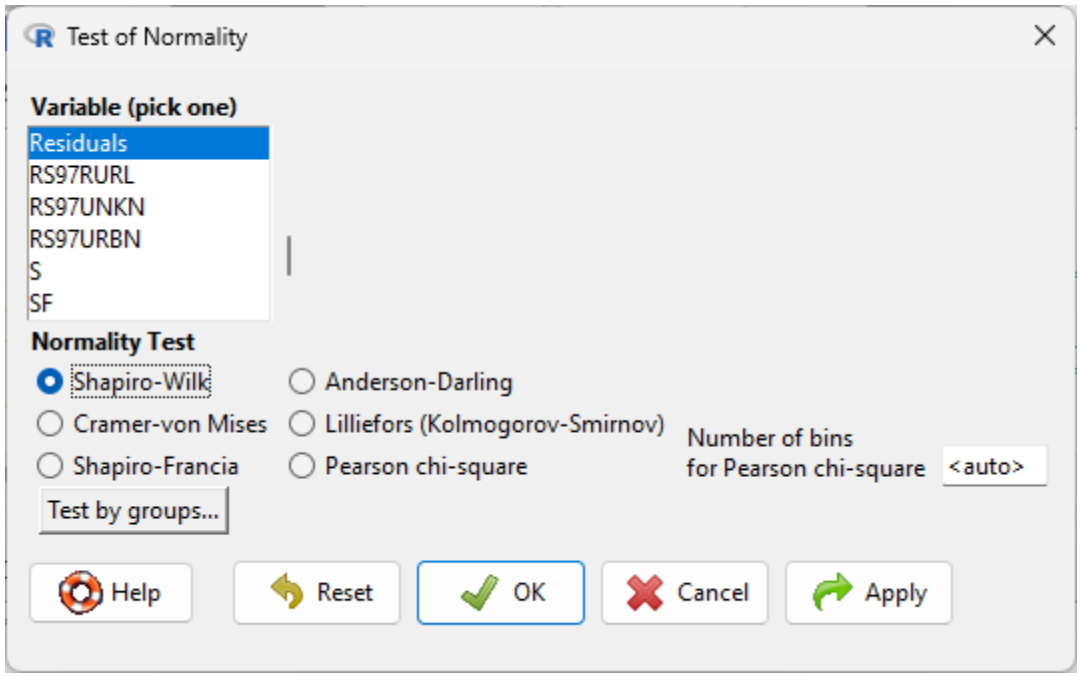

R Graphics: Device 2 (ACTIVE)
File
History
Resize
percent
0
10
20
30
40
50
-20
0
20
40
60
80
Residuals


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Color palette...
Index plot...
Dot plot...
Histogram...
Plot discrete numeric variable...
Density estimate...
Stem-and-leaf display...
Boxplot...
Quantile-comparison plot...
Symmetry boxplot...
Scatterplot...
Scatterplot matrix...
Line graph...
XY conditioning plot...
Plot of means...
Strip chart...
Bar graph...
Pie chart...
3D graph
Save graph to file
Data set: EAWE0
Model: RegModel.1
R Script R Markdown
local({
.x <- seq(-3.291,
plotDistr(.x, dno
main=paste("Norma
})
with(EAWE01, Hist(R
Boxplot(~ Residual
densityPlot(~ Resi
with(EAWE01, Hist(R
SE, xlab="x", ylab="Density",
dard deviation=1"))
eaks="Sturges", col="darkgray"))
d="y"))
adjust=1, kernel=dnorm, method="adaptive")
eaks="Sturges", col="darkgray"))
Output
Submit
> densityPlot(~ Re
SJ, adjust=1, kernel=dnorm, method="adaptive")
> with(EAWE01, Dotp
aks="Sturges"))
> local({
+ .x <- seq(-3.29
+ plotDistr(.x, dnorm(.x, mean=0, sd=1), cdf=FALSE, xlab="x", ylab="Density",
+ main=paste("Normal Distribution: Mean=0, Standard deviation=1"))
+ })
> with(EAWE01, Hist(Residuals, scale="density", breaks="Sturges", col="darkgray"))
> Boxplot(~ Residuals, data=EAWE01, id=list(method="y"))
[1] "68" "45" "101" "451" "223" "104" "450" "443" "229" "27"
> densityPlot(~ Residuals, data=EAWE01, bw=bw.SJ, adjust=1, kernel=dnorm, method="adaptive")
> with(EAWE01, Hist(Residuals, scale="percent", breaks="Sturges", col="darkgray"))
Messages
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 96 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.


Boxplot
Data
Options
Variable (pick one or more)
REGS
REGW
Residuals
RS97RURL
RS97UNKN
RS97URBN
Plot by groups...
Help
Reset
OK
Cancel
Apply


R Graphics: Device 2 (ACTIVE)
File
History
Resize
Residuals
80
60
40
20
0
-20
68
450
443
229


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Summaries
Contingency tables
Means
Proportions
Variances
Nonparametric tests
Dimensional analysis
Fit models
Active data set
Numerical summaries...
Frequency distributions...
Count missing observations
Table of statistics...
Correlation matrix...
Correlation test...
Test of normality...
Transform toward normality...
Data set:
RegModel.1
R Script
R Markdo
.x <- seq(
plotDistr(
main=paste
})
with(EAWE01,
Boxplot(~ Residuals, data=EAWE01
densityPlot(~ Residuals, data=EAWE01, bw=bw.SJ, adjust=1, kernel=dnorm, method="adaptive")
with(EAWE01, Hist(Residuals, scale="percent", breaks="Sturges", col="darkgray"))
Boxplot(~ Residuals, data=EAWE01, id=list(method="y"))
Submit
Output
> with(EAWE01, Dotplot(Residuals, bin=TRUE, breaks="Sturges"))
> local({
+ .x <- seq(-3.291, 3.291, length.out=1000)
+ plotDistr(.x, dnorm(.x, mean=0, sd=1), cdf=FALSE, xlab="x", ylab="Density",
+ main=paste("Normal Distribution: Mean=0, Standard deviation=1"))
+ })
> with(EAWE01, Hist(Residuals, scale="density", breaks="Sturges", col="darkgray"))
> Boxplot(~ Residuals, data=EAWE01, id=list(method="y"))
[1] "68" "45" "101" "451" "223" "104" "450" "443" "229" "27"
> densityPlot(~ Residuals, data=EAWE01, bw=bw.SJ, adjust=1, kernel=dnorm, method="adaptive")
> with(EAWE01, Hist(Residuals, scale="percent", breaks="Sturges", col="darkgray"))
> Boxplot(~ Residuals, data=EAWE01, id=list(method="y"))
[1] "68" "45" "101" "451" "223" "104" "450" "443" "229" "27"
Messages
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 96 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.


Test of Normality
Variable (pick one)
Residuals
RS97RURL
RS97UNKN
RS97URBN
S
SF
Normality Test
Shapiro-Wilk
Anderson-Darling
Cramer-von Mises
Lilliefors (Kolmogorov-Smirnov)
Shapiro-Francia
Pearson chi-square
Number of bins
for Pearson chi-square
<auto>
Test by groups...
Help
Reset
OK
Cancel
Apply

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.2

R Script | R Markdown

```
summary(RegModel.2)
vif(RegModel.2)
round(cov2cor(vcov(RegModel.2)), 3) # Correlations of parameter estimates
scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)
scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)
bptest(EARNINGS ~ EXP + S, varformula = ~ fitted.values(RegModel.2), studentize=FALSE, data=EAWE01)
with(EAWE01, Hist(Residuals, scale="percent", breaks="Sturges", col="darkgray"))
Boxplot( ~ Residuals, data=EAWE01, id=list(method="y"))
normalityTest(~Residuals, test="shapiro.test", data=EAWE01)
```

Submit

Output

```
        Breusch-Pagan test

data:  EARNINGS ~ EXP + S
BP = 1.2703, df = 1, p-value = 0.2597


> with(EAWE01, Hist(Residuals, scale="percent", breaks="Sturges", col="darkgray"))

> Boxplot( ~ Residuals, data=EAWE01, id=list(method="y"))
 [1] "68"  "45"  "451" "223" "101" "104" "450" "443" "27"  "229"

> normalityTest(~Residuals, test="shapiro.test", data=EAWE01)

        Shapiro-Wilk normality test

data:  Residuals
W = 0.82109, p-value < 2.2e-16
```

Messages

```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```

Are there any Omitted Variables?

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.1

R Script | R Markdown

```
RegModel.1 <- lm(EARNINGS~S, data=EAWE01)
summary(RegModel.1)
```

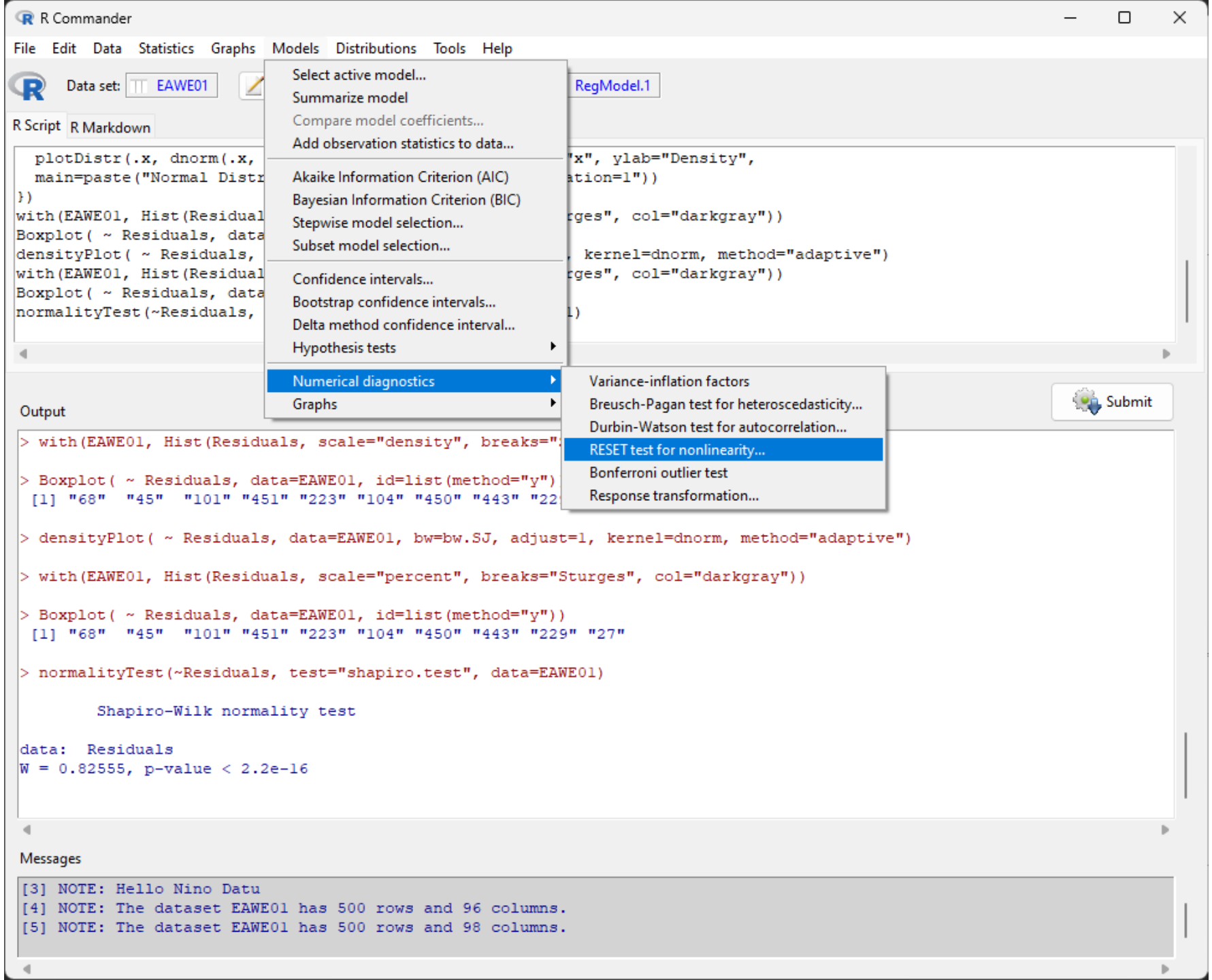
Submit

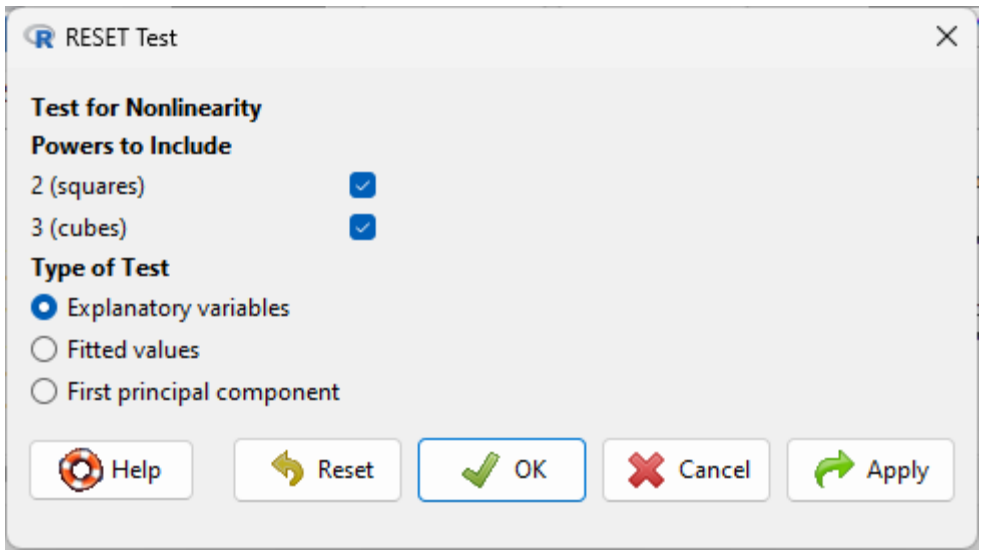
Output

```
Call:
lm(formula = EARNINGS ~ S, data = EAWE01)

Residuals:
    Min      1Q  Median      3Q     Max
-17.177  -6.588  -2.147   3.532  86.424

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   3.0897     2.4638   1.254     0.21
S             1.0487     0.1664   6.304 6.41e-10 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10.33 on 498 degrees of freedom
Multiple R-squared:  0.0739, Adjusted R-squared:  0.07204
F-statistic: 39.74 on 1 and 498 DF,  p-value: 6.407e-10
```

Messages

```
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 96 columns.
```


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: EAWE01
RegModel.1
R Script R Markdown
Select active model...
Summarize model
Compare model coefficients...
Add observation statistics to data...
Akaike Information Criterion (AIC)
Bayesian Information Criterion (BIC)
Stepwise model selection...
Subset model selection...
Confidence intervals...
Bootstrap confidence intervals...
Delta method confidence interval...
Hypothesis tests
Numerical diagnostics
Graphs
Variance-inflation factors
Breusch-Pagan test for heteroscedasticity...
Durbin-Watson test for autocorrelation...
RESET test for nonlinearity...
Bonferroni outlier test
Response transformation...
Submit
Output
> with(EAWE01, Hist(Residuals, scale="density", breaks="
> Boxplot(~ Residuals, data=EAWE01, id=list(method="y"))
[1] "68" "45" "101" "451" "223" "104" "450" "443" "22
> densityPlot(~ Residuals, data=EAWE01, bw=bw.SJ, adjust=1, kernel=dnorm, method="adaptive")
> with(EAWE01, Hist(Residuals, scale="percent", breaks="Sturges", col="darkgray"))
> Boxplot(~ Residuals, data=EAWE01, id=list(method="y"))
[1] "68" "45" "101" "451" "223" "104" "450" "443" "229" "27"
> normalityTest(~Residuals, test="shapiro.test", data=EAWE01)
Shapiro-Wilk normality test
data: Residuals
W = 0.82555, p-value < 2.2e-16
Messages
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 96 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.


RESET Test
Test for Nonlinearity
Powers to Include
2 (squares)
3 (cubes)
Type of Test
Explanatory variables
Fitted values
First principal component
Help
Reset
OK
Cancel
Apply

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.2

R Script | R Markdown

```
vif(RegModel.2)
round(cov2cor(vcov(RegModel.2)), 3) # Correlations of parameter estimates
scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)
scatterplotMatrix(~EXP+Residuals+S, regLine=TRUE, smooth=FALSE, diagonal=list(method="density"), data=EAWE01)
bptest(EARNINGS ~ EXP + S, varformula = ~ fitted.values(RegModel.2), studentize=FALSE, data=EAWE01)
with(EAWE01, Hist(Residuals, scale="percent", breaks="Sturges", col="darkgray"))
Boxplot( ~ Residuals, data=EAWE01, id=list(method="y"))
normalityTest(~Residuals, test="shapiro.test", data=EAWE01)
resettest(EARNINGS ~ EXP + S, power=2:3, type="regressor", data=EAWE01)
```

Submit

Output

```
> Boxplot( ~ Residuals, data=EAWE01, id=list(method="y"))
 [1] "68"  "45"  "451" "223" "101" "104" "450" "443" "27"  "229"

> normalityTest(~Residuals, test="shapiro.test", data=EAWE01)

        Shapiro-Wilk normality test

data:  Residuals
W = 0.82109, p-value < 2.2e-16


> resettest(EARNINGS ~ EXP + S, power=2:3, type="regressor", data=EAWE01)

        RESET test

data:  EARNINGS ~ EXP + S
RESET = 1.7514, df1 = 4, df2 = 493, p-value = 0.1375
```

Messages

```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```

Which is model is better?

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.1

1

R Script | R Markdown

```
bptest(EARNINGS ~ EXP + S, varformula = ~ fitted.values(RegModel.2), studentize=FALSE, data=EAWE01)
with(EAWE01, Hist(Residuals, scale="percent", breaks="Sturges", col="darkgray"))
Boxplot( ~ Residuals, data=EAWE01, id=list(method="y"))
normalityTest(~Residuals, test="shapiro.test", data=EAWE01)
resettest(EARNINGS ~ EXP + S, power=2:3, type="regressor", data=EAWE01)
AIC(RegModel.2)
BIC(RegModel.2)
AIC(RegModel.1)
BIC(RegModel.1)
```

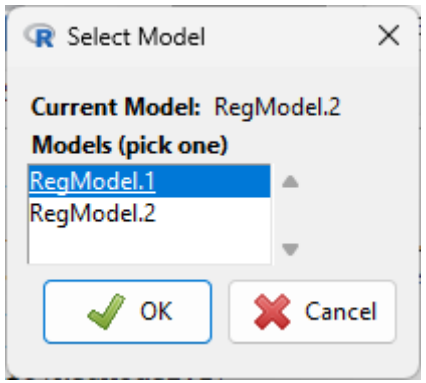
Submit

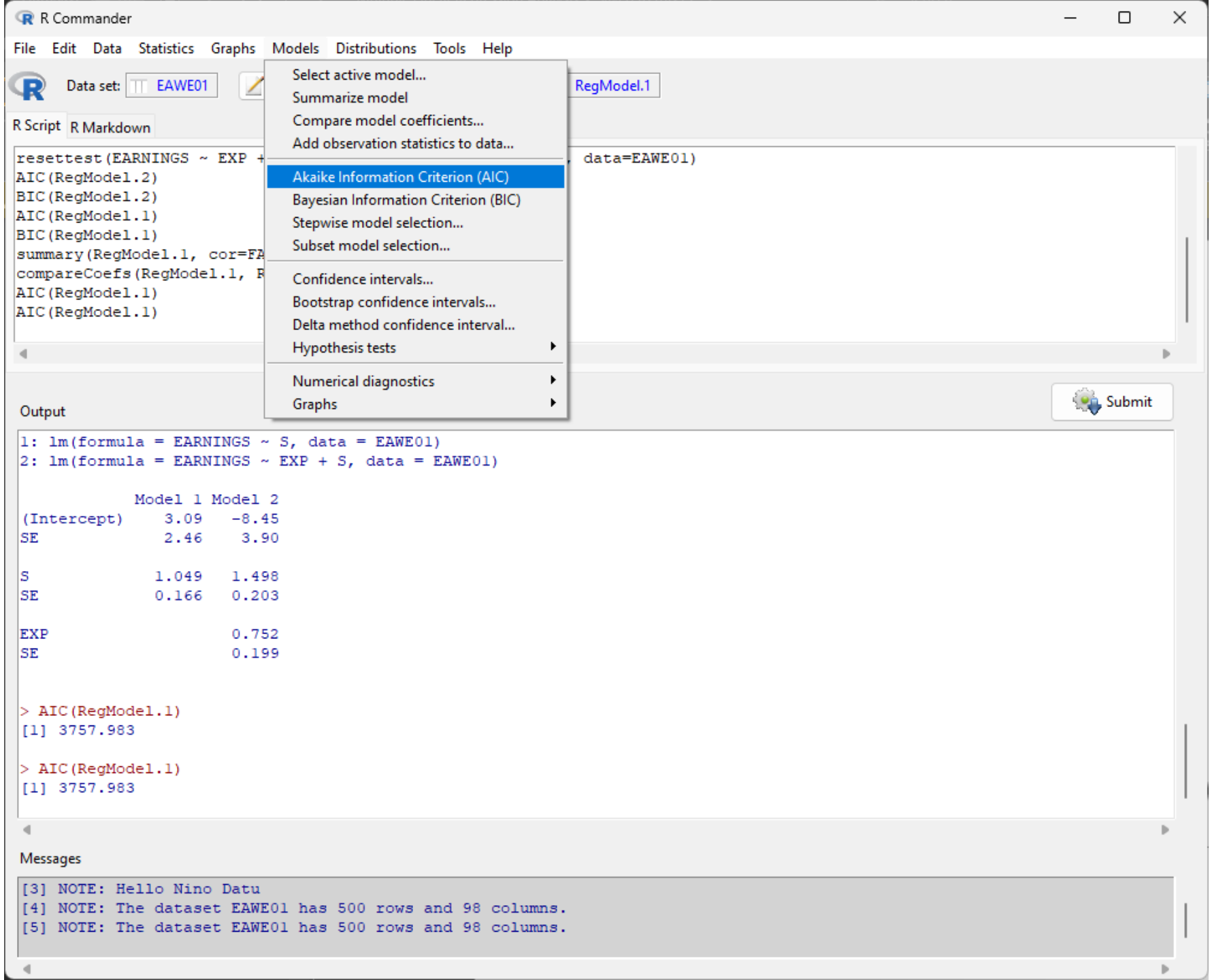
Output

```
> resettest(EARNINGS ~ EXP + S, power=2:3, type="regressor", data=EAWE01)

        RESET test

data:  EARNINGS ~ EXP + S
RESET = 1.7514, df1 = 4, df2 = 493, p-value = 0.1375


> AIC(RegModel.2)
[1] 3745.835

> BIC(RegModel.2)
[1] 3762.694

> AIC(RegModel.1)
[1] 3757.983

> BIC(RegModel.1)
[1] 3770.627
```

Messages

```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```


Select Model
Current Model: RegModel.2
Models (pick one)
RegModel.1
RegModel.2
OK
Cancel


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: EAWE01
RegModel.1
Select active model...
Summarize model
Compare model coefficients...
Add observation statistics to data...
Akaike Information Criterion (AIC)
Bayesian Information Criterion (BIC)
Stepwise model selection...
Subset model selection...
Confidence intervals...
Bootstrap confidence intervals...
Delta method confidence interval...
Hypothesis tests
Numerical diagnostics
Graphs
R Script R Markdown
resettest(EARNINGS ~ EXP + , data=EAWE01)
AIC(RegModel.2)
BIC(RegModel.2)
AIC(RegModel.1)
BIC(RegModel.1)
summary(RegModel.1, cor=FA
compareCoefs(RegModel.1, R
AIC(RegModel.1)
AIC(RegModel.1)
Submit
Output
1: lm(formula = EARNINGS ~ S, data = EAWE01)
2: lm(formula = EARNINGS ~ EXP + S, data = EAWE01)
Model 1 Model 2
(Intercept) 3.09 -8.45
SE 2.46 3.90
S 1.049 1.498
SE 0.166 0.203
EXP 0.752
SE 0.199
> AIC(RegModel.1)
[1] 3757.983
> AIC(RegModel.1)
[1] 3757.983
Messages
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.1

R Script | R Markdown

```
AIC(RegModel.2)
BIC(RegModel.2)
AIC(RegModel.1)
BIC(RegModel.1)
summary(RegModel.1, cor=FALSE)
compareCoefs(RegModel.1, RegModel.2)
AIC(RegModel.1)
AIC(RegModel.1)
AIC(RegModel.1)
```

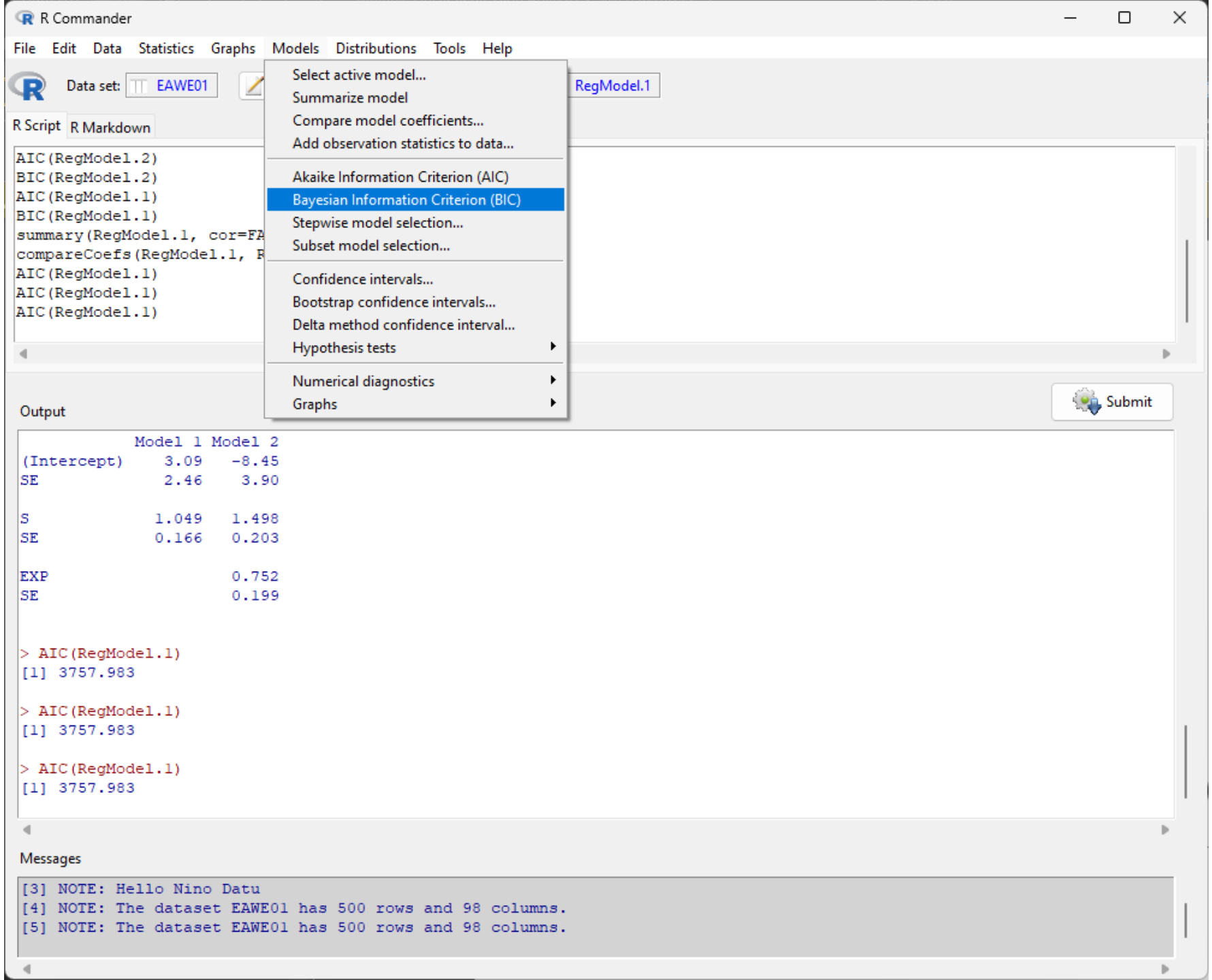
Submit

Output

```
            Model 1 Model 2
(Intercept)    3.09   -8.45
SE             2.46    3.90

S             1.049   1.498
SE            0.166   0.203

EXP                   0.752
SE                    0.199


> AIC(RegModel.1)
[1] 3757.983

> AIC(RegModel.1)
[1] 3757.983

> AIC(RegModel.1)
[1] 3757.983
```

Messages

```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: EAWE01
RegModel.1
Select active model...
Summarize model
Compare model coefficients...
Add observation statistics to data...
Akaike Information Criterion (AIC)
Bayesian Information Criterion (BIC)
Stepwise model selection...
Subset model selection...
Confidence intervals...
Bootstrap confidence intervals...
Delta method confidence interval...
Hypothesis tests
Numerical diagnostics
Graphs
R Script R Markdown
AIC(RegModel.2)
BIC(RegModel.2)
AIC(RegModel.1)
BIC(RegModel.1)
summary(RegModel.1, cor=FA
compareCoefs(RegModel.1, R
AIC(RegModel.1)
AIC(RegModel.1)
AIC(RegModel.1)
Submit
Output
Model 1 Model 2
(Intercept) 3.09 -8.45
SE 2.46 3.90
S 1.049 1.498
SE 0.166 0.203
EXP 0.752
SE 0.199
> AIC(RegModel.1)
[1] 3757.983
> AIC(RegModel.1)
[1] 3757.983
> AIC(RegModel.1)
[1] 3757.983
Messages
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.1

R Script | R Markdown

```
BIC(RegModel.2)
AIC(RegModel.1)
BIC(RegModel.1)
summary(RegModel.1, cor=FALSE)
compareCoefs(RegModel.1, RegModel.2)
AIC(RegModel.1)
AIC(RegModel.1)
AIC(RegModel.1)
BIC(RegModel.1)
```

Submit

Output

```
S              1.049   1.498
SE             0.166   0.203

EXP                    0.752
SE                     0.199


> AIC(RegModel.1)
[1] 3757.983

> AIC(RegModel.1)
[1] 3757.983

> AIC(RegModel.1)
[1] 3757.983

> BIC(RegModel.1)
[1] 3770.627
```

Messages

```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.1

1

R Script | R Markdown

```
bptest(EARNINGS ~ EXP + S, varformula = ~ fitted.values(RegModel.2), studentize=FALSE, data=EAWE01)
with(EAWE01, Hist(Residuals, scale="percent", breaks="Sturges", col="darkgray"))
Boxplot( ~ Residuals, data=EAWE01, id=list(method="y"))
normalityTest(~Residuals, test="shapiro.test", data=EAWE01)
resettest(EARNINGS ~ EXP + S, power=2:3, type="regressor", data=EAWE01)
AIC(RegModel.2)
BIC(RegModel.2)
AIC(RegModel.1)
BIC(RegModel.1)
```

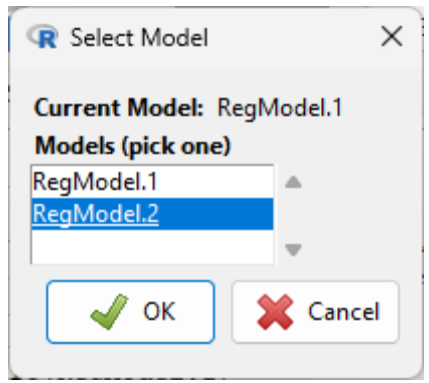
Submit

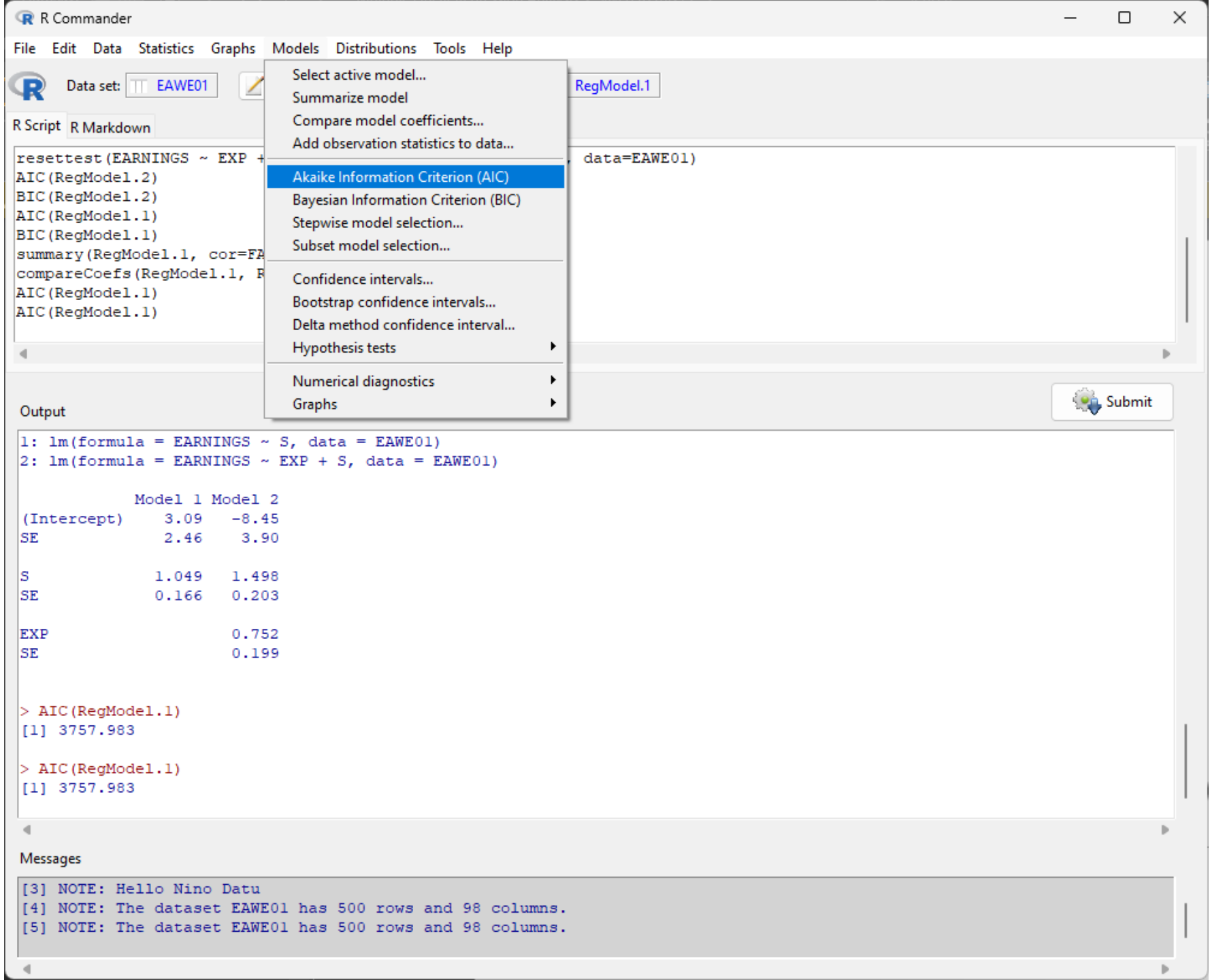
Output

```
> resettest(EARNINGS ~ EXP + S, power=2:3, type="regressor", data=EAWE01)

        RESET test

data:  EARNINGS ~ EXP + S
RESET = 1.7514, df1 = 4, df2 = 493, p-value = 0.1375


> AIC(RegModel.2)
[1] 3745.835

> BIC(RegModel.2)
[1] 3762.694

> AIC(RegModel.1)
[1] 3757.983

> BIC(RegModel.1)
[1] 3770.627
```

Messages

```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```


Select Model
Current Model: RegModel.1
Models (pick one)
RegModel.1
RegModel.2
OK
Cancel


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: EAWE01
RegModel.1
Select active model...
Summarize model
Compare model coefficients...
Add observation statistics to data...
Akaike Information Criterion (AIC)
Bayesian Information Criterion (BIC)
Stepwise model selection...
Subset model selection...
Confidence intervals...
Bootstrap confidence intervals...
Delta method confidence interval...
Hypothesis tests
Numerical diagnostics
Graphs
R Script R Markdown
resettest(EARNINGS ~ EXP + , data=EAWE01)
AIC(RegModel.2)
BIC(RegModel.2)
AIC(RegModel.1)
BIC(RegModel.1)
summary(RegModel.1, cor=FA
compareCoefs(RegModel.1, R
AIC(RegModel.1)
AIC(RegModel.1)
Submit
Output
1: lm(formula = EARNINGS ~ S, data = EAWE01)
2: lm(formula = EARNINGS ~ EXP + S, data = EAWE01)
Model 1 Model 2
(Intercept) 3.09 -8.45
SE 2.46 3.90
S 1.049 1.498
SE 0.166 0.203
EXP 0.752
SE 0.199
> AIC(RegModel.1)
[1] 3757.983
> AIC(RegModel.1)
[1] 3757.983
Messages
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.2

R Script | R Markdown

```
AIC(RegModel.1)
BIC(RegModel.1)
summary(RegModel.1, cor=FALSE)
compareCoefs(RegModel.1, RegModel.2)
AIC(RegModel.1)
AIC(RegModel.1)
AIC(RegModel.1)
BIC(RegModel.1)
AIC(RegModel.2)
```

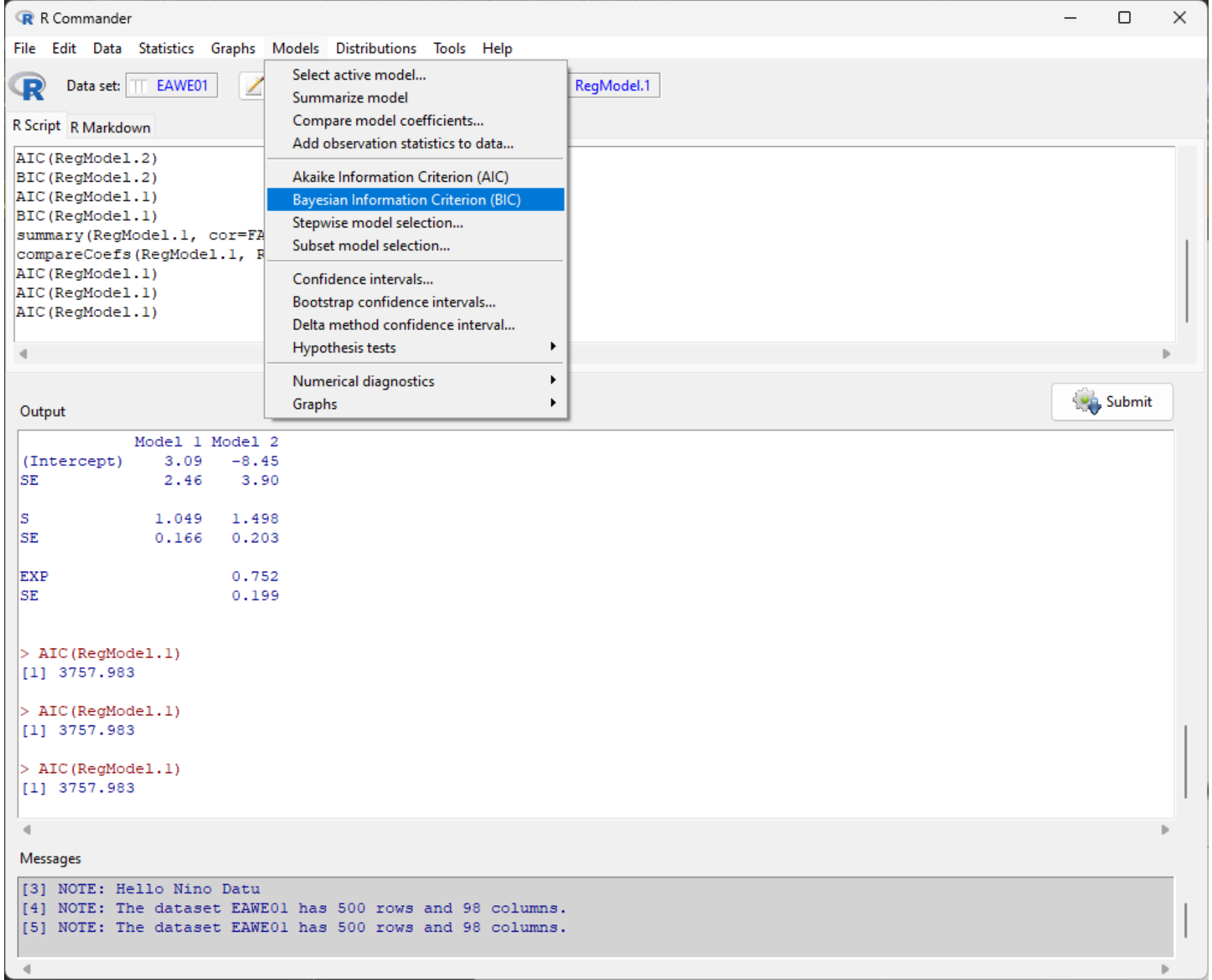
Submit

Output

```
EXP                  0.752
SE                   0.199


> AIC(RegModel.1)
[1] 3757.983

> AIC(RegModel.1)
[1] 3757.983

> AIC(RegModel.1)
[1] 3757.983

> BIC(RegModel.1)
[1] 3770.627

> AIC(RegModel.2)
[1] 3745.835
```

Messages

```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: EAWE01
RegModel.1
Select active model...
Summarize model
Compare model coefficients...
Add observation statistics to data...
Akaike Information Criterion (AIC)
Bayesian Information Criterion (BIC)
Stepwise model selection...
Subset model selection...
Confidence intervals...
Bootstrap confidence intervals...
Delta method confidence interval...
Hypothesis tests
Numerical diagnostics
Graphs
R Script R Markdown
AIC(RegModel.2)
BIC(RegModel.2)
AIC(RegModel.1)
BIC(RegModel.1)
summary(RegModel.1, cor=FA
compareCoefs(RegModel.1, R
AIC(RegModel.1)
AIC(RegModel.1)
AIC(RegModel.1)
Submit
Output
Model 1 Model 2
(Intercept) 3.09 -8.45
SE 2.46 3.90
S 1.049 1.498
SE 0.166 0.203
EXP 0.752
SE 0.199
> AIC(RegModel.1)
[1] 3757.983
> AIC(RegModel.1)
[1] 3757.983
> AIC(RegModel.1)
[1] 3757.983
Messages
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.2

R Script | R Markdown

```
BIC(RegModel.1)
summary(RegModel.1, cor=FALSE)
compareCoefs(RegModel.1, RegModel.2)
AIC(RegModel.1)
AIC(RegModel.1)
AIC(RegModel.1)
BIC(RegModel.1)
AIC(RegModel.2)
BIC(RegModel.2)
```

Submit

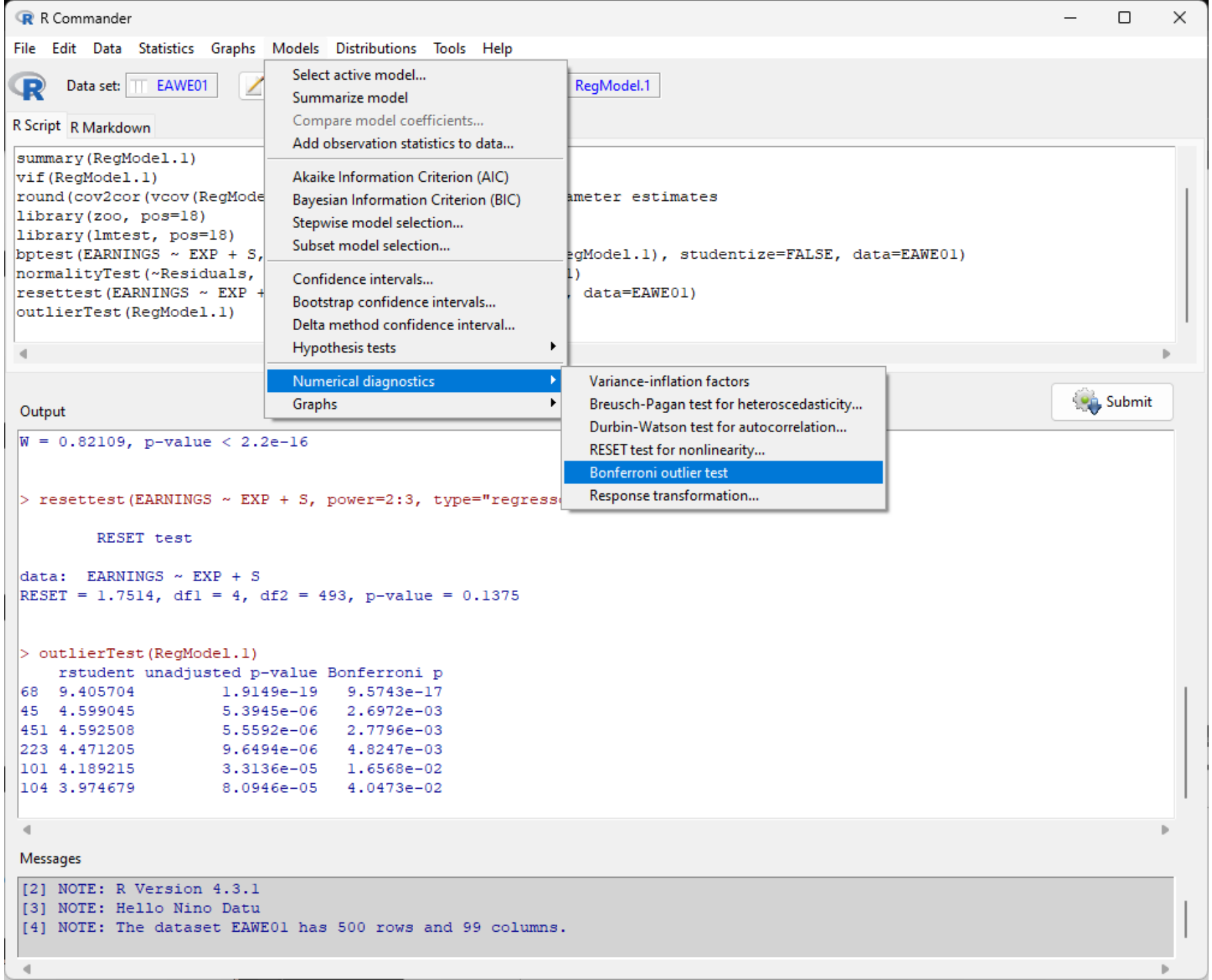
Output

```
> AIC(RegModel.1)
[1] 3757.983

> AIC(RegModel.1)
[1] 3757.983

> AIC(RegModel.1)
[1] 3757.983

> BIC(RegModel.1)
[1] 3770.627

> AIC(RegModel.2)
[1] 3745.835

> BIC(RegModel.2)
[1] 3762.694
```

Messages

```
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
[5] NOTE: The dataset EAWE01 has 500 rows and 98 columns.
```

Detecting outlier


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: EAWE01
RegModel.1
R Script R Markdown
summary(RegModel.1)
vif(RegModel.1)
round(cov2cor(vcov(RegMode
library(zoo, pos=18)
library(lmtest, pos=18)
bptest(EARNINGS ~ EXP + S,
normalityTest(~Residuals,
resettest(EARNINGS ~ EXP +
outlierTest(RegModel.1)
ameter estimates
egModel.1), studentize=FALSE, data=EAWE01)
1)
, data=EAWE01)
Select active model...
Summarize model
Compare model coefficients...
Add observation statistics to data...
Akaike Information Criterion (AIC)
Bayesian Information Criterion (BIC)
Stepwise model selection...
Subset model selection...
Confidence intervals...
Bootstrap confidence intervals...
Delta method confidence interval...
Hypothesis tests
Numerical diagnostics
Graphs
Variance-inflation factors
Breusch-Pagan test for heteroscedasticity...
Durbin-Watson test for autocorrelation...
RESET test for nonlinearity...
Bonferroni outlier test
Response transformation...
Submit
Output
W = 0.82109, p-value < 2.2e-16
> resettest(EARNINGS ~ EXP + S, power=2:3, type="regress
RESET test
data: EARNINGS ~ EXP + S
RESET = 1.7514, df1 = 4, df2 = 493, p-value = 0.1375
> outlierTest(RegModel.1)
rstudent unadjusted p-value Bonferroni p
68 9.405704 1.9149e-19 9.5743e-17
45 4.599045 5.3945e-06 2.6972e-03
451 4.592508 5.5592e-06 2.7796e-03
223 4.471205 9.6494e-06 4.8247e-03
101 4.189215 3.3136e-05 1.6568e-02
104 3.974679 8.0946e-05 4.0473e-02
Messages
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 99 columns.

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: RegModel.1

R Script | R Markdown

```
summary(RegModel.1)
vif(RegModel.1)
round(cov2cor(vcov(RegModel.1)), 3) # Correlations of parameter estimates
library(zoo, pos=18)
library(lmtest, pos=18)
bptest(EARNINGS ~ EXP + S, varformula = ~ fitted.values(RegModel.1), studentize=FALSE, data=EAWE01)
normalityTest(~Residuals, test="shapiro.test", data=EAWE01)
resettest(EARNINGS ~ EXP + S, power=2:3, type="regressor", data=EAWE01)
outlierTest(RegModel.1)
```

Submit

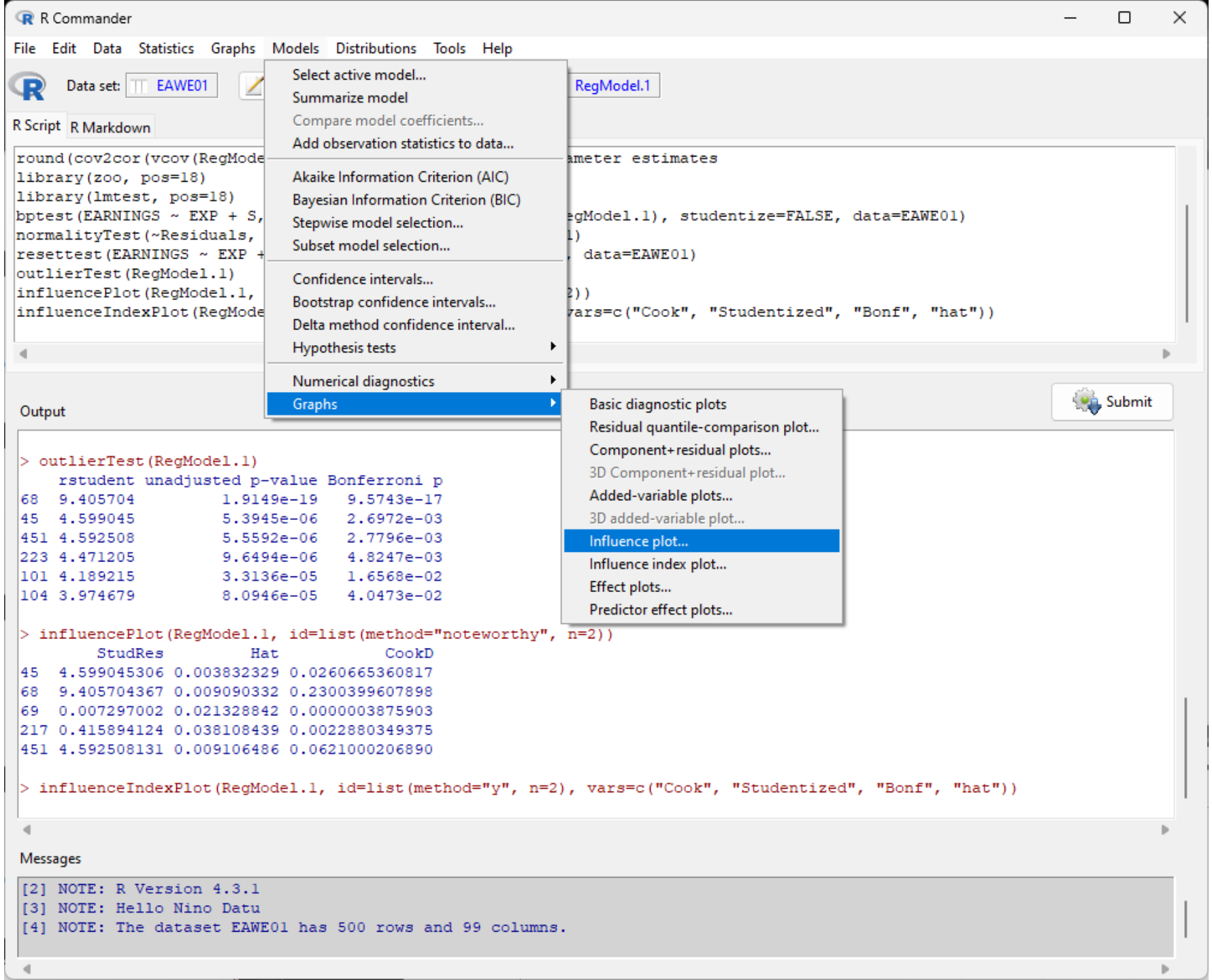
Output

```
W = 0.82109, p-value < 2.2e-16


> resettest(EARNINGS ~ EXP + S, power=2:3, type="regressor", data=EAWE01)

        RESET test

data:  EARNINGS ~ EXP + S
RESET = 1.7514, df1 = 4, df2 = 493, p-value = 0.1375


> outlierTest(RegModel.1)
     rstudent unadjusted p-value Bonferroni p
68   9.405704         1.9149e-19   9.5743e-17
45   4.599045         5.3945e-06   2.6972e-03
451  4.592508         5.5592e-06   2.7796e-03
223  4.471205         9.6494e-06   4.8247e-03
101  4.189215         3.3136e-05   1.6568e-02
104  3.974679         8.0946e-05   4.0473e-02
```

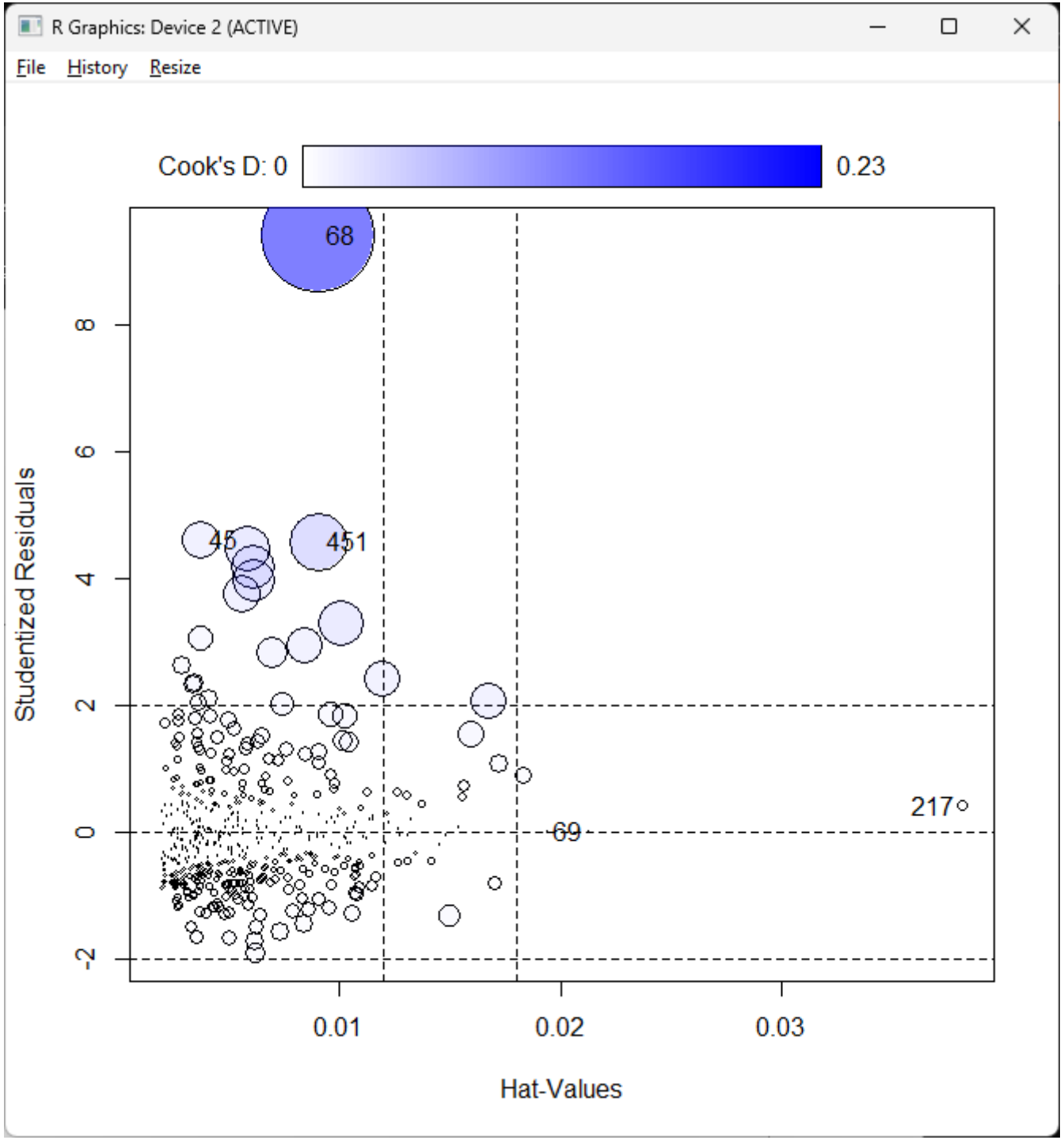
Messages

```
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 99 columns.
```

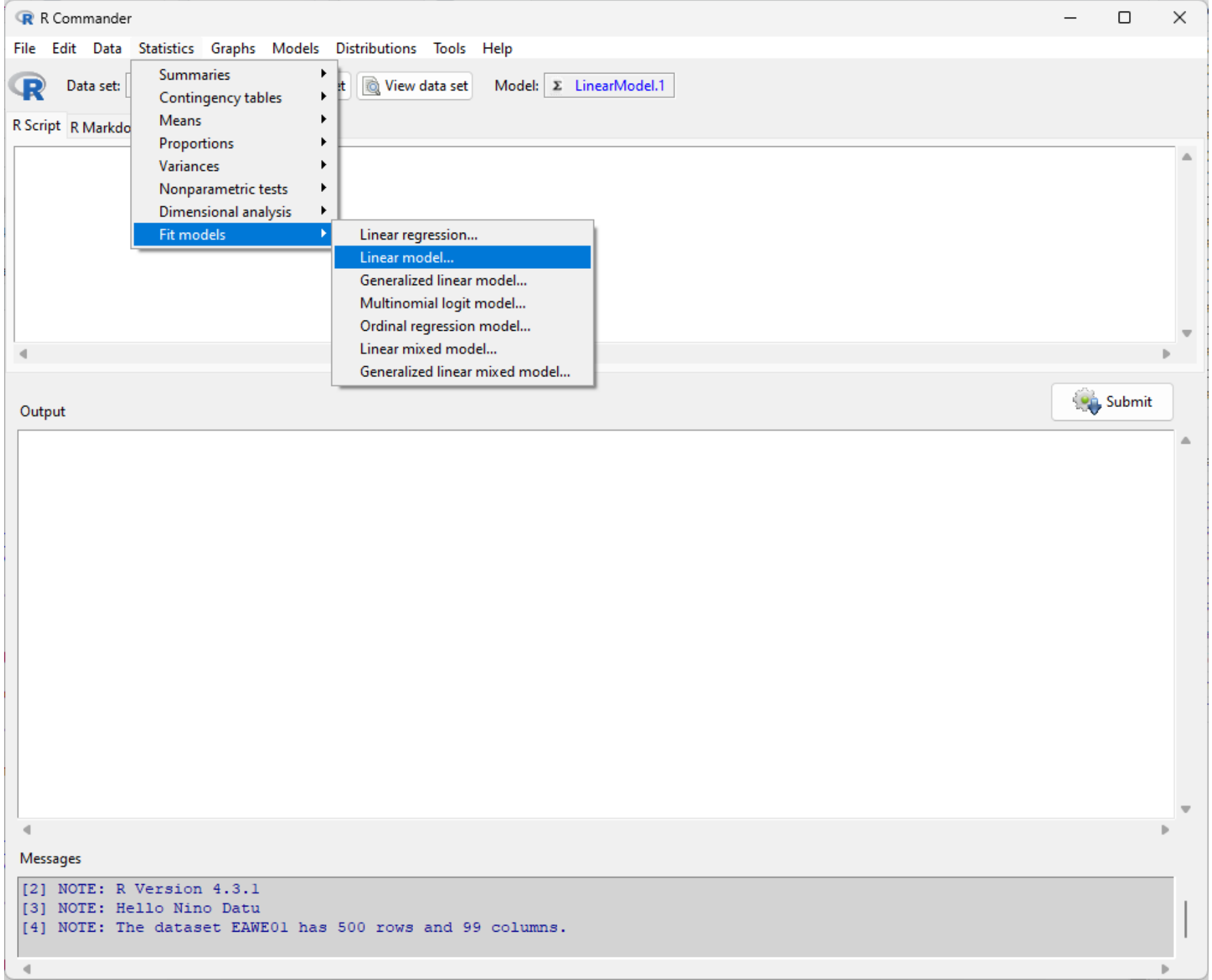
Detecting Influential data

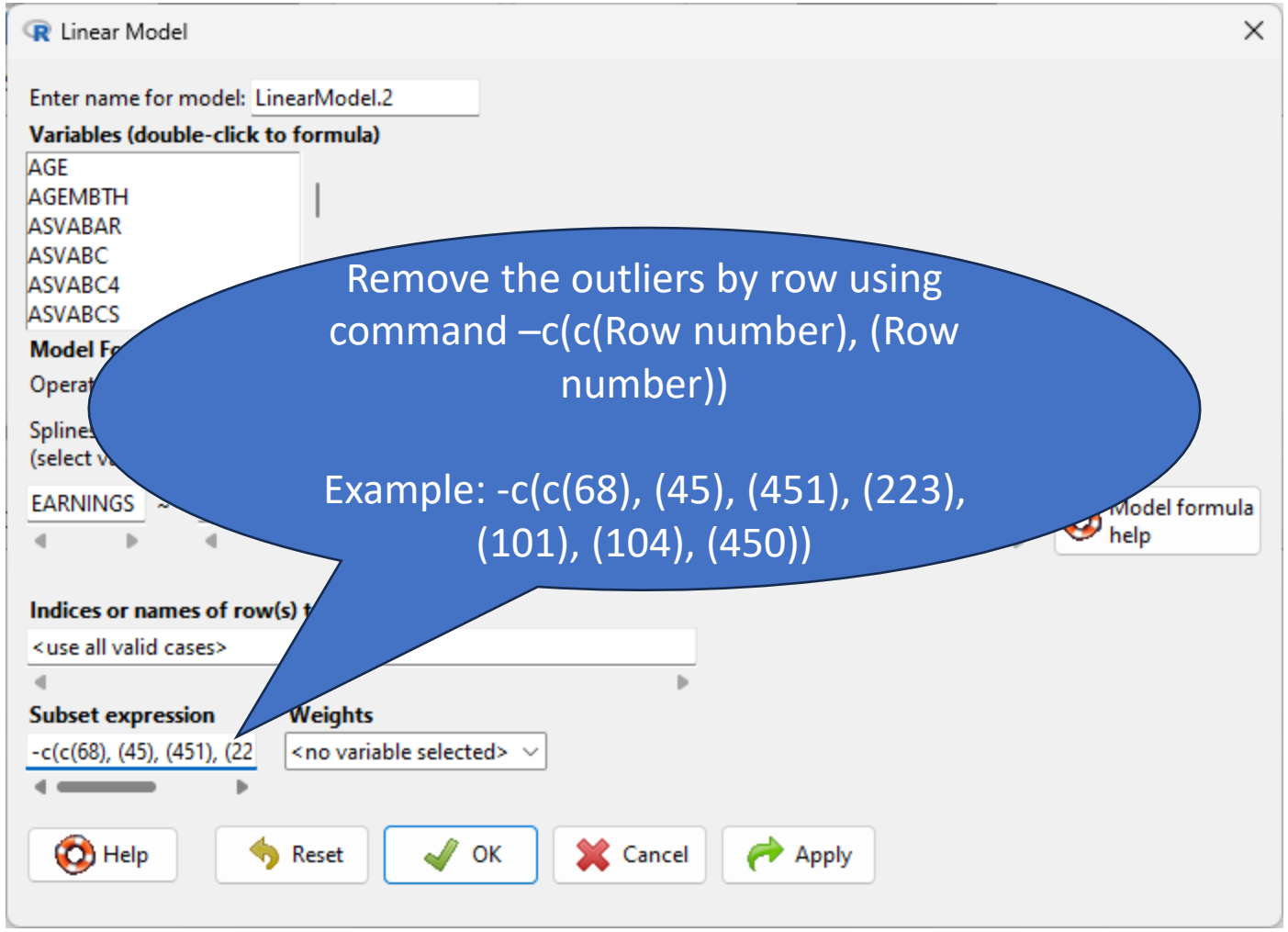

R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Data set: EAWE01
RegModel.1
R Script R Markdown
round(cov2cor(vcov(RegMode
library(zoo, pos=18)
library(lmtest, pos=18)
bptest(EARNINGS ~ EXP + S,
normalityTest(~Residuals,
resettest(EARNINGS ~ EXP +
outlierTest(RegModel.1)
influencePlot(RegModel.1,
influenceIndexPlot(RegMode
ameter estimates
egModel.1), studentize=FALSE, data=EAWE01)
1)
, data=EAWE01)
2))
vars=c("Cook", "Studentized", "Bonf", "hat"))
Select active model...
Summarize model
Compare model coefficients...
Add observation statistics to data...
Akaike Information Criterion (AIC)
Bayesian Information Criterion (BIC)
Stepwise model selection...
Subset model selection...
Confidence intervals...
Bootstrap confidence intervals...
Delta method confidence interval...
Hypothesis tests
Numerical diagnostics
Graphs
Basic diagnostic plots
Residual quantile-comparison plot...
Component+residual plots...
3D Component+residual plot...
Added-variable plots...
3D added-variable plot...
Influence plot...
Influence index plot...
Effect plots...
Predictor effect plots...
Submit
Output
> outlierTest(RegModel.1)
rstudent unadjusted p-value Bonferroni p
68 9.405704 1.9149e-19 9.5743e-17
45 4.599045 5.3945e-06 2.6972e-03
451 4.592508 5.5592e-06 2.7796e-03
223 4.471205 9.6494e-06 4.8247e-03
101 4.189215 3.3136e-05 1.6568e-02
104 3.974679 8.0946e-05 4.0473e-02
> influencePlot(RegModel.1, id=list(method="noteworthy", n=2))
StudRes Hat CookD
45 4.599045306 0.003832329 0.0260665360817
68 9.405704367 0.009090332 0.2300399607898
69 0.007297002 0.021328842 0.0000003875903
217 0.415894124 0.038108439 0.0022880349375
451 4.592508131 0.009106486 0.0621000206890
> influenceIndexPlot(RegModel.1, id=list(method="y", n=2), vars=c("Cook", "Studentized", "Bonf", "hat"))
Messages
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 99 columns.


Influence Plot
Saved to this PC
Identify Points
Automatically
Interactively with mouse
Number of points to identify
2
Help
Reset
OK
Cancel
Apply


R Graphics: Device 2 (ACTIVE)
File
History
Resize
Cook's D: 0
0.23
68
45
451
217
69
Studentized Residuals
8
6
4
2
0
-2
0.01
0.02
0.03
Hat-Values

Removing Outliers in the Regression Model


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Summaries
Contingency tables
Means
Proportions
Variances
Nonparametric tests
Dimensional analysis
Fit models
Linear regression...
Linear model...
Generalized linear model...
Multinomial logit model...
Ordinal regression model...
Linear mixed model...
Generalized linear mixed model...
Data set:
View data set
Model: LinearModel.1
R Script
Submit
Output
Messages
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 99 columns.


Linear Model
Enter name for model: LinearModel.2
Variables (double-click to formula)
AGE
AGEMBTH
ASVABAR
ASVABC
ASVABC4
ASVABCS
EARNINGS
Model formula help
Remove the outliers by row using command –c(c(Row number), (Row number))
Example: -c(c(68), (45), (451), (223), (101), (104), (450))
Indices or names of row(s)
<use all valid cases>
Subset expression
-c(c(68), (45), (451), (22
Weights
<no variable selected>
Help
Reset
OK
Cancel
Apply

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: LinearModel.2

R Script | R Markdown

```
LinearModel.2 <- lm(EARNINGS ~ EXP + S, data = EAWE01, subset = -c(c(68), (45), (451), (223), (101), (104), (450)))
summary(LinearModel.2)
```

Submit

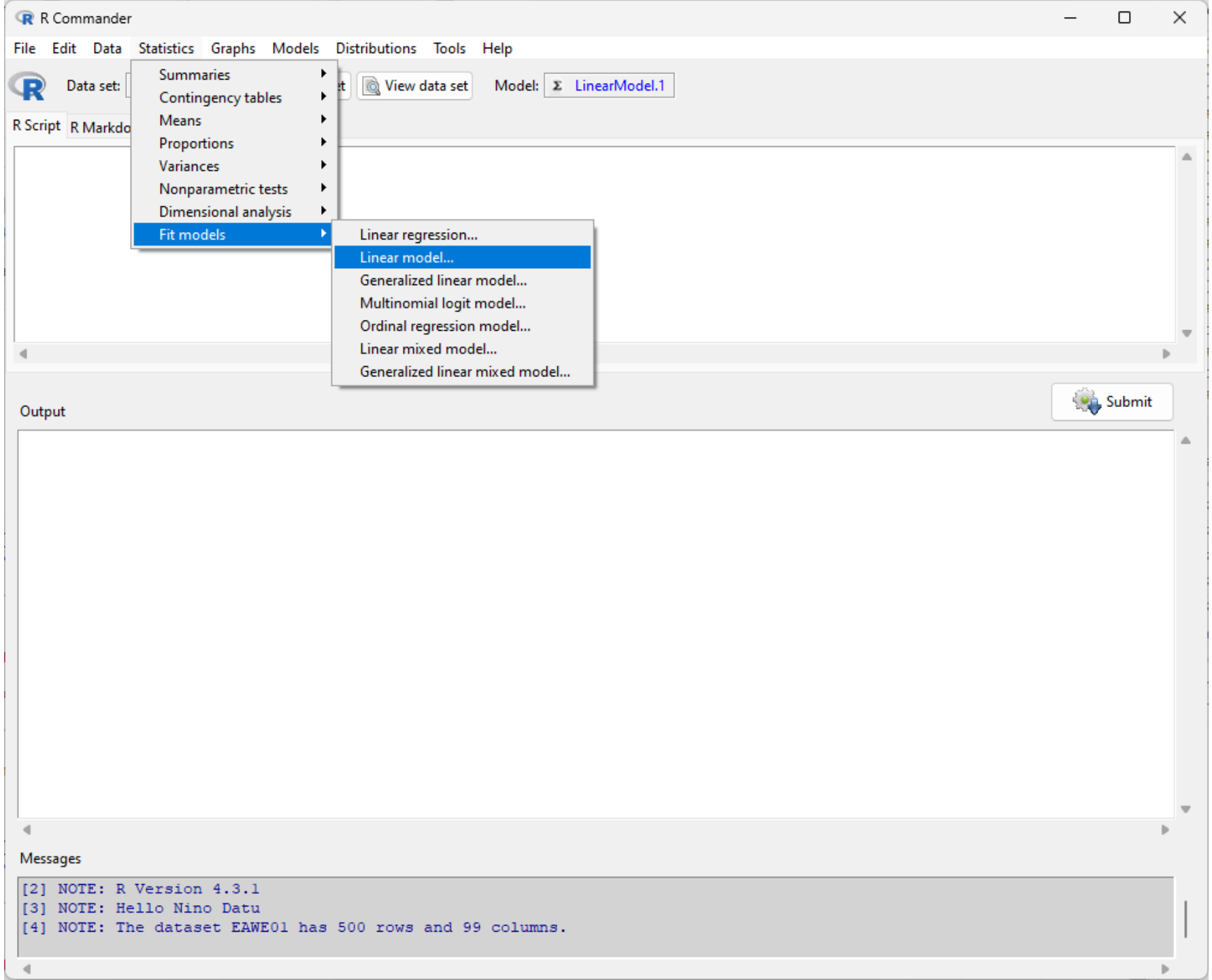
Output

```
lm(formula = EARNINGS ~ EXP + S, data = EAWE01, subset = -c(c(68),
    (45), (451), (223), (101), (104), (450)))

Residuals:
    Min      1Q  Median      3Q     Max
-18.624  -5.583  -1.119   3.844  33.315

Coefficients:
            Estimate Std. Error t value   Pr(>|t|)
(Intercept) -11.2372     3.1512  -3.566   0.000398 ***
EXP           0.7768     0.1608   4.831 0.00000182 ***
S             1.6298     0.1635   9.967    < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 8.167 on 490 degrees of freedom
Multiple R-squared:  0.1707, Adjusted R-squared:  0.1674
F-statistic: 50.45 on 2 and 490 DF,  p-value: < 2.2e-16
```

Messages

```
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 99 columns.
```

Addressing violation of assumption on normality through Data transformation


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Summaries
Contingency tables
Means
Proportions
Variances
Nonparametric tests
Dimensional analysis
Fit models
Linear regression...
Linear model...
Generalized linear model...
Multinomial logit model...
Ordinal regression model...
Linear mixed model...
Generalized linear mixed model...
Data set:
View data set
Model: LinearModel.1
R Script
Submit
Output
Messages
[2] NOTE: R Version 4.3.1
[3] NOTE: Hello Nino Datu
[4] NOTE: The dataset EAWE01 has 500 rows and 99 columns.

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: LinearModel.4

R Script | R Markdown

```
AIC(LinearModel.4)
AIC(LinearModel.2)
LinearModel.5 <- lm(EARNINGS ~ EXP + S, data = EAWE01, subset = -c(c(68), (45), (451), (223), (101), (104), (450)))
summary(LinearModel.5)
anova(LinearModel.2, LinearModel.4)
Anova(LinearModel.5, type="II")
plot(regsubsets(EARNINGS ~ EXP + S, data=EAWE01, nbest=10, nvmax=3), scale='adjr2')
LinearModel.4 <- lm(log(EARNINGS) ~ EXP + S, data = EAWE01)
summary(LinearModel.4)
```

Submit

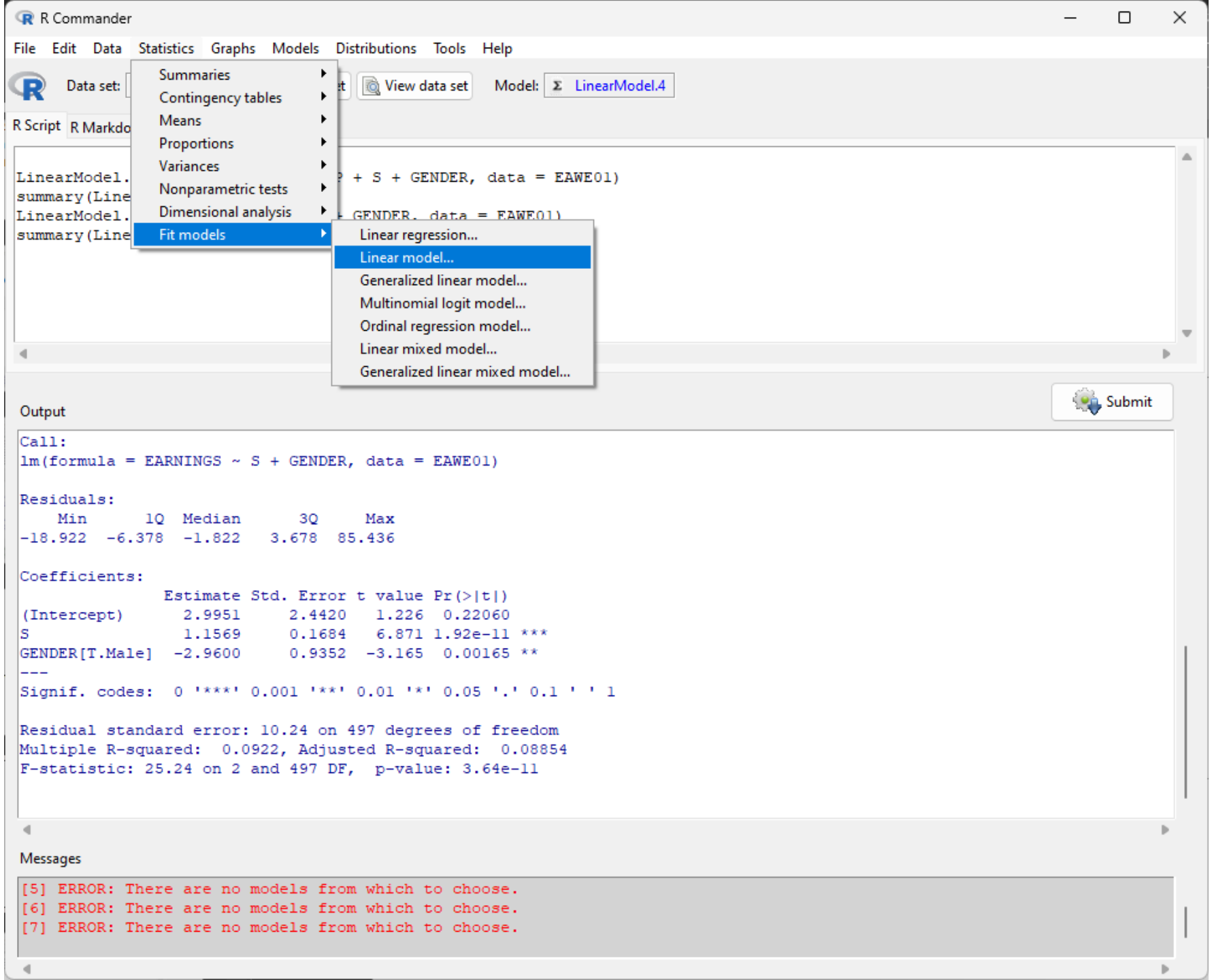
Output

```
Call:
lm(formula = log(EARNINGS) ~ EXP + S, data = EAWE01)

Residuals:
     Min       1Q   Median       3Q      Max
-2.19367 -0.30849  0.01975  0.30018  2.24242

Coefficients:
            Estimate Std. Error t value     Pr(>|t|)
(Intercept)  1.07769    0.19704   5.470 0.0000000716 ***
EXP          0.04769    0.01004   4.748 0.0000026880 ***
S            0.09393    0.01023   9.184      < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5144 on 497 degrees of freedom
Multiple R-squared:  0.146, Adjusted R-squared:  0.1426
F-statistic: 42.48 on 2 and 497 DF,  p-value: < 2.2e-16
```

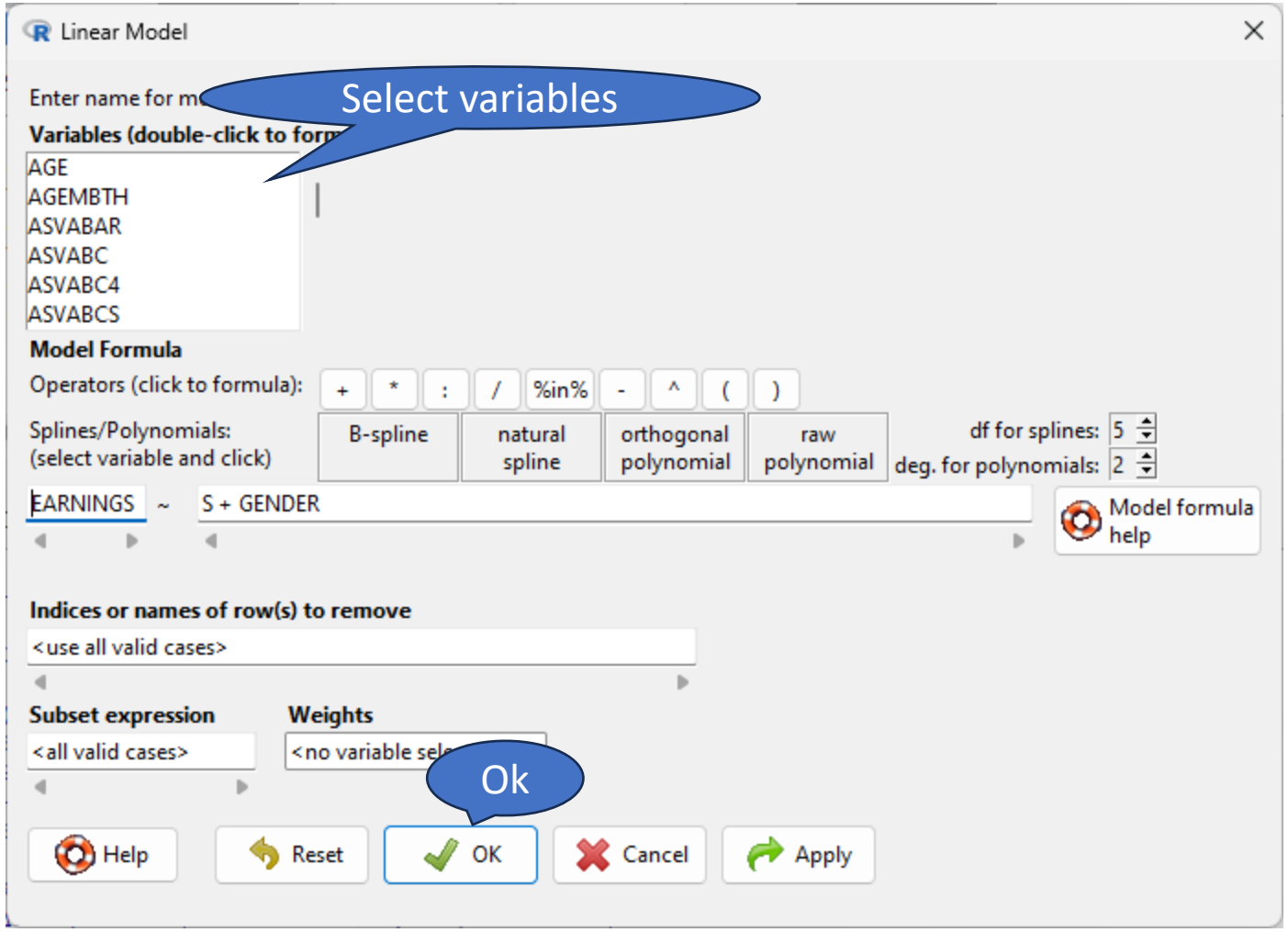
Messages

```
models with response '"log(EARNINGS)"' removed because response differs from model 1
[6] WARNING: Warning in anova.lmlist(object, ...) :
models with response '"log(EARNINGS)"' removed because response differs from model 1
```

Dummy Variable Regression


R Commander
File Edit Data Statistics Graphs Models Distributions Tools Help
Summaries
Contingency tables
Means
Proportions
Variances
Nonparametric tests
Dimensional analysis
Fit models
Linear regression...
Linear model...
Generalized linear model...
Multinomial logit model...
Ordinal regression model...
Linear mixed model...
Generalized linear mixed model...
Data set:
View data set
Model: LinearModel.4
R Script
LinearModel.
summary(Line
LinearModel.
summary(Line
+ S + GENDER, data = EAWE01)
+ GENDER, data = EAWE01)
Submit
Output
Call:
lm(formula = EARNINGS ~ S + GENDER, data = EAWE01)
Residuals:
Min 1Q Median 3Q Max
-18.922 -6.378 -1.822 3.678 85.436
Coefficients:
Estimate Std. Error t value Pr(>|t|)
(Intercept) 2.9951 2.4420 1.226 0.22060
S 1.1569 0.1684 6.871 1.92e-11 ***
GENDER[T.Male] -2.9600 0.9352 -3.165 0.00165 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 10.24 on 497 degrees of freedom
Multiple R-squared: 0.0922, Adjusted R-squared: 0.08854
F-statistic: 25.24 on 2 and 497 DF, p-value: 3.64e-11
Messages
[5] ERROR: There are no models from which to choose.
[6] ERROR: There are no models from which to choose.
[7] ERROR: There are no models from which to choose.


Linear Model
Select variables
Enter name for m
Variables (double-click to form
AGE
AGEMBTH
ASVABAR
ASVABC
ASVABC4
ASVABCS
Model Formula
Operators (click to formula):
+
*
:
/
%in%
-
^
(
)
Splines/Polynomials:
(select variable and click)
B-spline
natural spline
orthogonal polynomial
raw polynomial
df for splines: 5
deg. for polynomials: 2
EARNINGS ~ S + GENDER
Model formula help
Indices or names of row(s) to remove
<use all valid cases>
Subset expression
<all valid cases>
Weights
<no variable sel
Ok
Help
Reset
OK
Cancel
Apply

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: LinearModel.4

R Script | R Markdown

```
LinearModel.3 <- lm(EARNINGS ~ EXP + S + GENDER, data = EAWE01)
summary(LinearModel.3)
LinearModel.4 <- lm(EARNINGS ~ S + GENDER, data = EAWE01)
summary(LinearModel.4)
```

Submit

Output

```
Call:
lm(formula = EARNINGS ~ S + GENDER, data = EAWE01)

Residuals:
    Min      1Q  Median      3Q     Max
-18.922  -6.378  -1.822   3.678  85.436

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)     2.9951     2.4420   1.226  0.22060
S               1.1569     0.1684   6.871 1.92e-11 ***
GENDER[T.Male] -2.9600     0.9352  -3.165  0.00165 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10.24 on 497 degrees of freedom
Multiple R-squared:  0.0922, Adjusted R-squared:  0.08854
F-statistic: 25.24 on 2 and 497 DF,  p-value: 3.64e-11
```

Messages

```
[5] ERROR: There are no models from which to choose.
[6] ERROR: There are no models from which to choose.
[7] ERROR: There are no models from which to choose.
```

Interaction Effect

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Summaries
Contingency tables
Means
Proportions
Variances
Nonparametric tests
Dimensional analysis
Fit models

Linear regression...
Linear model...
Generalized linear model...
Multinomial logit model...
Ordinal regression model...
Linear mixed model...
Generalized linear mixed model...

Data set: View data set Model: LinearModel.5

R Script R Markdo

```
LinearModel. + S + GENDER, data = EAWE01)
summary(Line
LinearModel. GENDER, data = EAWE01)
summary(Line
library(Matrix, pos=18)
library(lme4, pos=18)
LinearModel.5 <- lm(EARNINGS ~ GE
summary(LinearModel.5)
scatterplot(S~EARNINGS | GENDER, , boxplots=FALSE, by.groups=TRUE, data=EAWE01)
scatterplot(S~EARNINGS | GENDER, boxplots=FALSE, by.groups=TRUE, data=EAWE01)
scatterplot(EARNINGS~S | GENDER, boxplots=FALSE, by.groups=TRUE, data=EAWE01)
```

Submit

Output

```
Call:
lm(formula = EARNINGS ~ GENDER * S, data = EAWE01)

Residuals:
    Min      1Q  Median      3Q     Max
-17.798  -6.442  -1.781   3.586  83.788

Coefficients:
                Estimate Std. Error t value Pr(>|t|)
(Intercept)       8.7801     3.2427   2.708  0.00701 **
GENDER[T.Male]  -16.1454     4.9893  -3.236  0.00129 **
S                 0.7432     0.2273   3.270  0.00115 **
GENDER[T.Male]:S  0.9034     0.3359   2.690  0.00739 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10.17 on 496 degrees of freedom
Multiple R-squared:  0.1052, Adjusted R-squared:  0.09984
F-statistic: 19.45 on 3 and 496 DF,  p-value: 6.18e-12


> scatterplot(S~EARNINGS | GENDER, regLine=FALSE, smooth=FALSE, boxplots=FALSE, by.groups=TRUE, data=EAWE01)

> scatterplot(S~EARNINGS | GENDER, regLine=TRUE, smooth=FALSE, boxplots=FALSE, by.groups=TRUE, data=EAWE01)

> scatterplot(EARNINGS~S | GENDER, regLine=TRUE, smooth=FALSE, boxplots=FALSE, by.groups=TRUE, data=EAWE01)
```

Messages

```
[5] ERROR: There are no models from which to choose.
[6] ERROR: There are no models from which to choose.
[7] ERROR: There are no models from which to choose.
```

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE01 | Edit data set | View data set | Model: LinearModel.6

R Script | R Markdown

```
LinearModel.3 <- lm(EARNINGS ~ EXP + S + GENDER, data = EAWE01)
summary(LinearModel.3)
LinearModel.4 <- lm(EARNINGS ~ S + GENDER, data = EAWE01)
summary(LinearModel.4)
library(Matrix, pos=18)
library(lme4, pos=18)
LinearModel.5 <- lm(EARNINGS ~ GENDER*S, data = EAWE01)
summary(LinearModel.5)
scatterplot(S~EARNINGS | GENDER, regLine=FALSE, smooth=FALSE, boxplots=FALSE, by.groups=TRUE, data=EAWE01)
```

Submit

Output

```
> scatterplot(EARNINGS~S | GENDER, regLine=TRUE, smooth=FALSE, boxplots=FALSE, by.groups=TRUE, data=EAWE01)

> LinearModel.6 <- lm(EARNINGS ~ GENDER * S, data = EAWE01)

> summary(LinearModel.6)

Call:
lm(formula = EARNINGS ~ GENDER * S, data = EAWE01)

Residuals:
    Min      1Q  Median      3Q     Max
-17.798  -6.442  -1.781   3.586  83.788

Coefficients:
                Estimate Std. Error t value Pr(>|t|)
(Intercept)       8.7801     3.2427   2.708  0.00701 **
GENDER[T.Male]  -16.1454     4.9893  -3.236  0.00129 **
S                 0.7432     0.2273   3.270  0.00115 **
GENDER[T.Male]:S  0.9034     0.3359   2.690  0.00739 **
---
```

Messages

```
[5] ERROR: There are no models from which to choose.
[6] ERROR: There are no models from which to choose.
[7] ERROR: There are no models from which to choose.
```

R Commander

File Edit Data Statistics Graphs Models Distributions Tools Help

Data set: EAWE0 Model: LinearModel.6

R Script R Markdown

```
LinearModel.3 <- lm                                   data = EAWE01)
summary(LinearModel
LinearModel.4 <- lm                                   = EAWE01)
summary(LinearModel
library(Matrix, pos=
library(lme4, pos=1
LinearModel.5 <- lm                                   EAWE01)
summary(LinearModel
scatterplot(S~EARNI                                   smooth=FALSE, boxplots=FALSE, by.groups=TRUE, data=EAWE01)
```

Submit

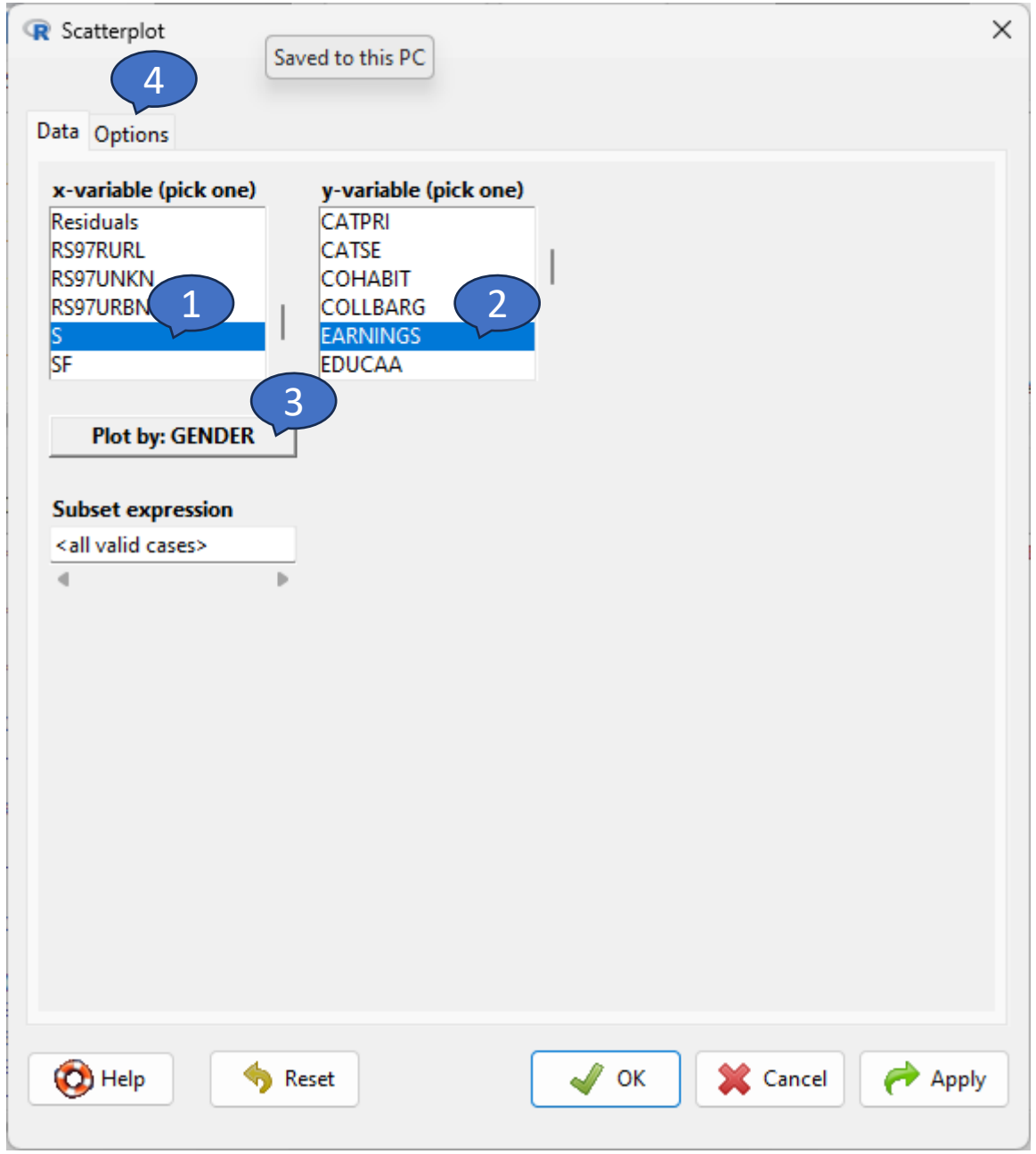
Output

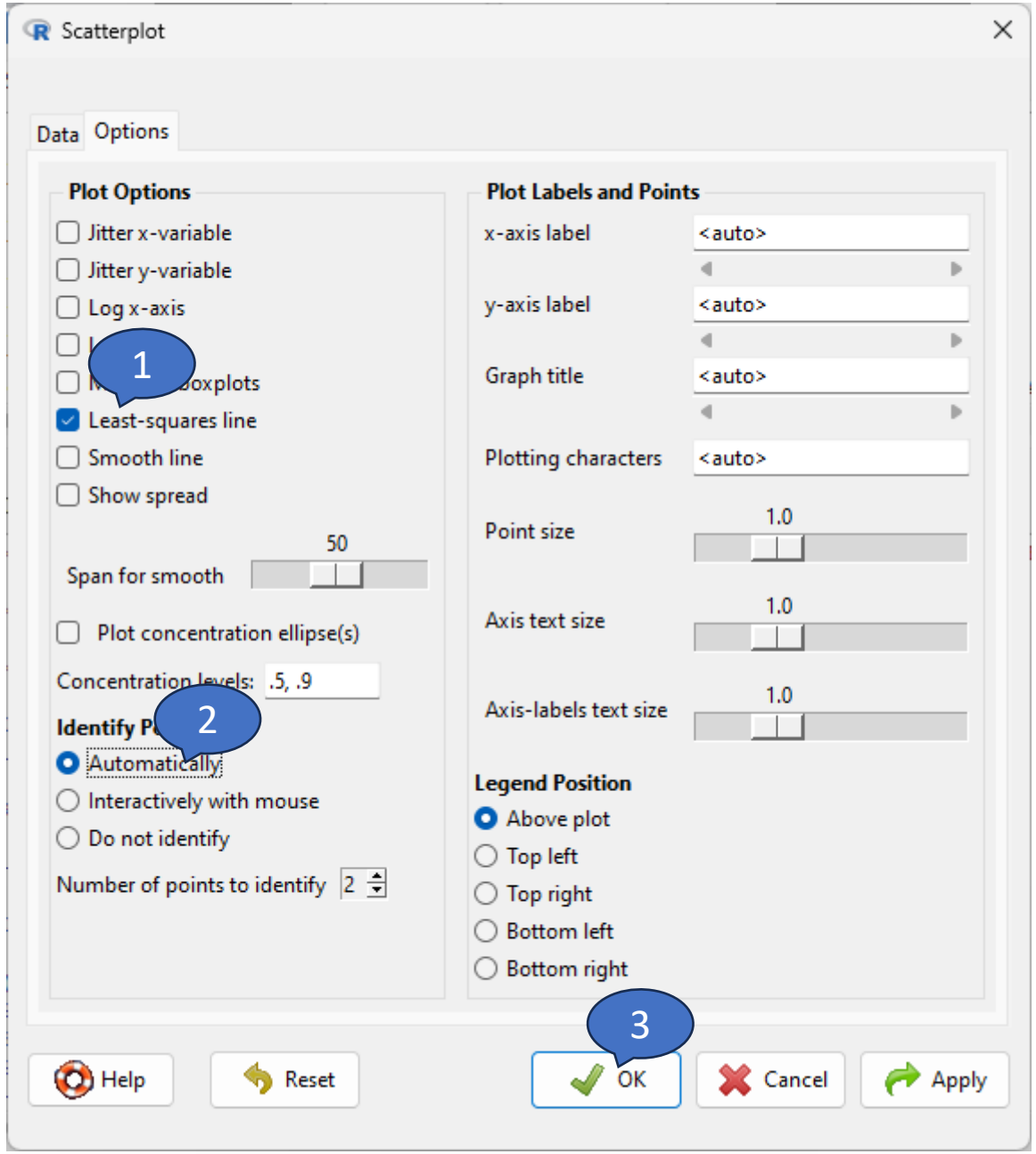
```
> scatterplot(EARNI                                   smooth=FALSE, boxplots=FALSE, by.groups=TRUE, data=EAWE01)

> LinearModel.6 <-                                    ta = EAWE01)

> summary(LinearMod

Call:
lm(formula = EARNINGS ~ GENDER * S, data = EAWE01)

Residuals:
    Min      1Q  Median      3Q     Max
-17.798  -6.442  -1.781   3.586  83.788

Coefficients:
                Estimate Std. Error t value Pr(>|t|)
(Intercept)       8.7801     3.2427   2.708  0.00701 **
GENDER[T.Male]  -16.1454     4.9893  -3.236  0.00129 **
S                 0.7432     0.2273   3.270  0.00115 **
GENDER[T.Male]:S  0.9034     0.3359   2.690  0.00739 **
---
```

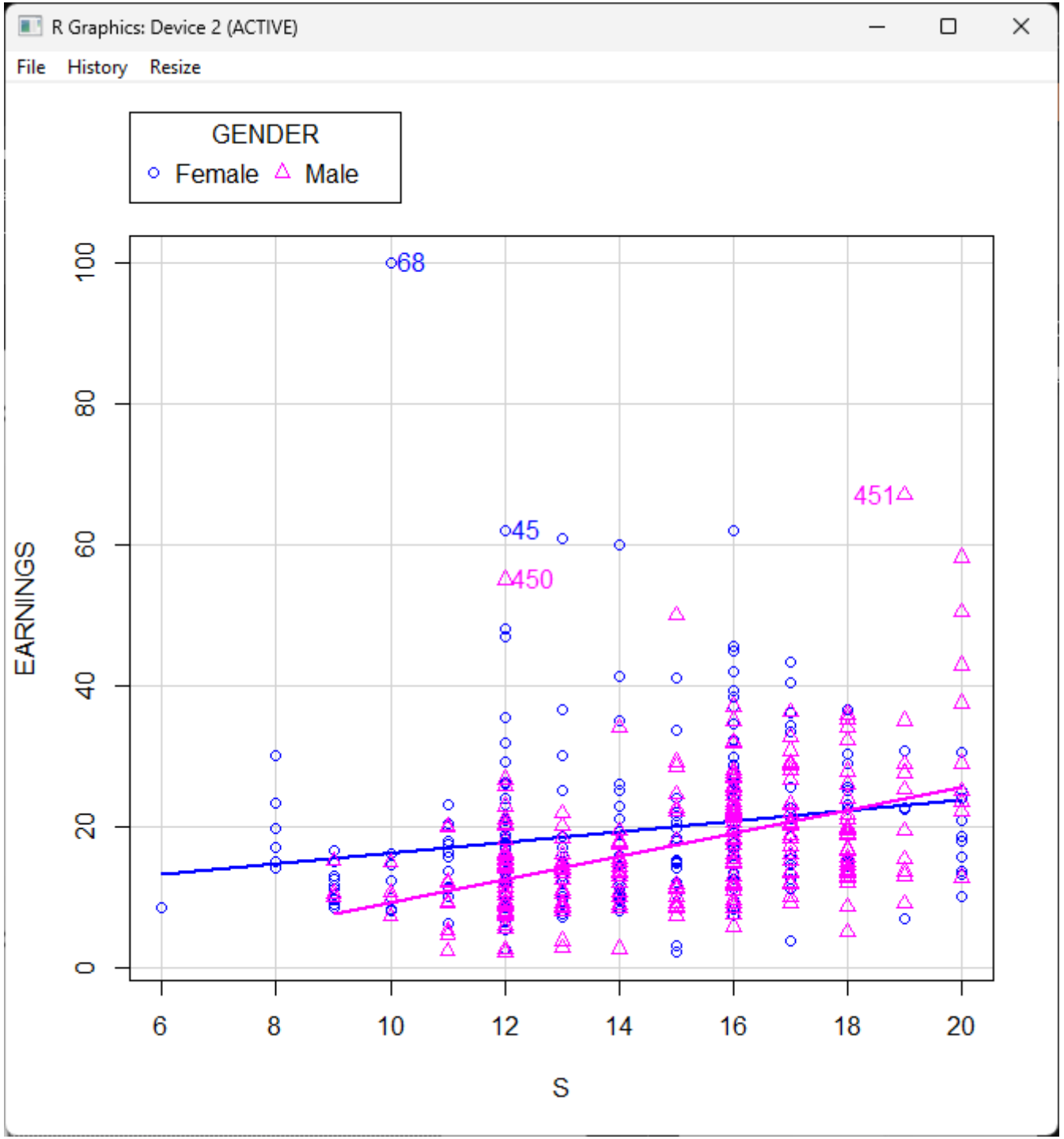
Messages

```
[5] ERROR: There are no models from which to choose.
[6] ERROR: There are no models from which to choose.
[7] ERROR: There are no models from which to choose.
```

Color palette...
Index plot...
Dot plot...
Histogram...
Plot discrete numeric variable...
Density estimate...
Stem-and-leaf display...
Boxplot...
Quantile-comparison plot...
Symmetry boxplot...
Scatterplot...
Scatterplot matrix...
Line graph...
XY conditioning plot...
Plot of means...
Strip chart...
Bar graph...
Pie chart...
3D graph
Save graph to file


Scatterplot
Saved to this PC
4
Data
Options
x-variable (pick one)
Residuals
RS97RURL
RS97UNKN
RS97URBN
S
SF
1
y-variable (pick one)
CATPRI
CATSE
COHABIT
COLLBARG
EARNINGS
EDUCAA
2
3
Plot by: GENDER
Subset expression
<all valid cases>
Help
Reset
OK
Cancel
Apply


Scatterplot
Data
Options
Plot Options
Jitter x-variable
Jitter y-variable
Log x-axis
boxplots
Least-squares line
Smooth line
Show spread
50
Span for smooth
Plot concentration ellipse(s)
Concentration levels: .5, .9
Automatically
Interactively with mouse
Do not identify
Number of points to identify 2
Plot Labels and Points
x-axis label <auto>
y-axis label <auto>
Graph title <auto>
Plotting characters <auto>
Point size 1.0
Axis text size 1.0
Axis-labels text size 1.0
Legend Position
Above plot
Top left
Top right
Bottom left
Bottom right
1
2
3
Help
Reset
OK
Cancel
Apply


R Graphics: Device 2 (ACTIVE)
File
History
Resize
GENDER
Female
Male
EARNINGS
S
0
20
40
60
80
100
6
8
10
12
14
16
18
20
68
45
450
451