

## UPLOAD DATA

By default this tab loads two sample datasets from The R Datasets Package.

Also you can load your own dataset in \*.txt or \*.csv file format.

easyMLR: A ShinyApp for Multiple Linear Regression Analysis

Introduction **Upload Data** Define Model Analysis Diagnostics Variable Selection Help

Choose data source:

- Load example dataset from R
- Upload your own dataset file

You can upload your data as separated by comma, tab, semicolon or space.

Upload a delimited text file (max. 10MB):

Browse... fitness.csv **Upload complete**

Delimiter:

- Comma
- Tab
- Semicolon
- Space
- First row as names of variables

Show 1 entries Search:

Age	Weight	Oxygen	RunTime	RestPulse	RunPulse
44	89.47	44.609	11.37	62	178
44	85.84	54.297	8.65	45	156
38	89.02	49.874	9.22	55	178
40	75.98	45.681	11.95	70	176
44	81.42	39.442	13.08	63	174
44	73.03	50.541	10.13	45	168
45	66.45	44.754	11.12	51	176
54	83.12	51.855	10.33	50	166
51	69.63	40.836	10.95	57	168
48	91.63	46.774	10.25	48	162
57	73.37	39.407	12.63	58	174
52	76.32	45.441	9.63	48	164

## DEFINE MODEL

This tab lets to choose a response variable and one or more predictor variables.

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Select the response variable: Girth

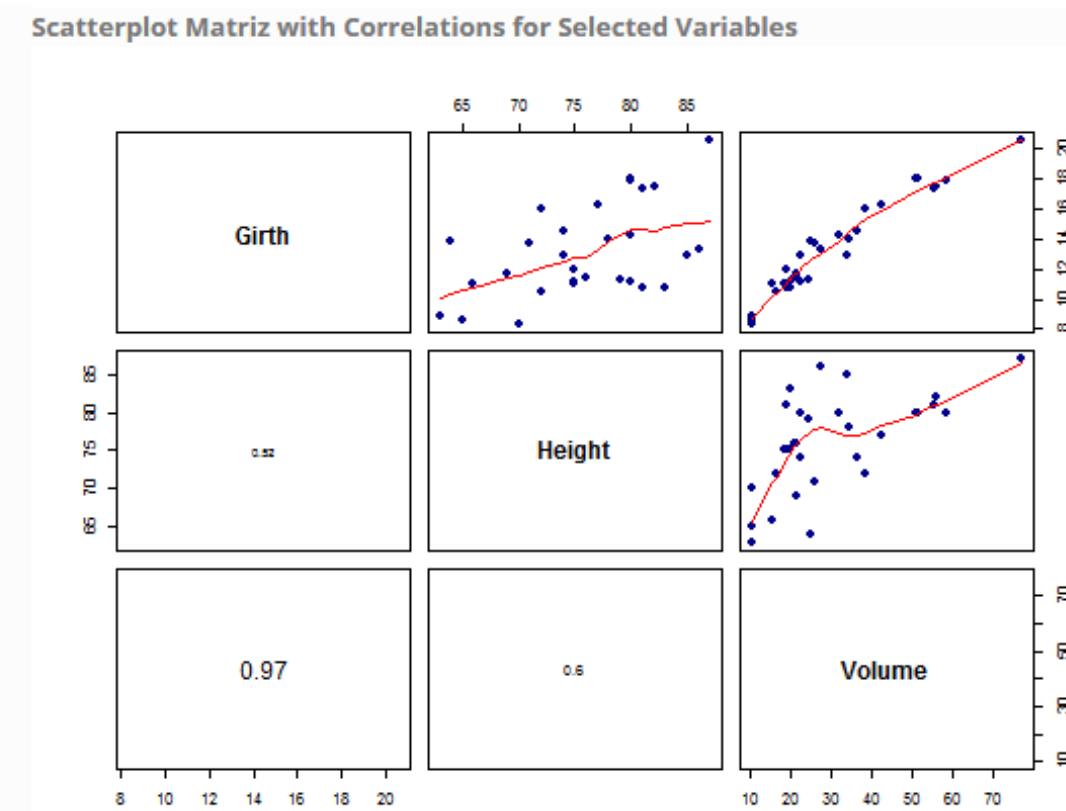
Select the predictor variable(s): Height, Volume

Descriptive Analysis for the Response Variable

Histogram for Girth

Estimated density for Girth

Boxplot for Girth



## ANALYSIS

This tab shows basic results from a linear regression analysis such as the Table of Analysis of Variance, some summary statistics and the Table of Estimated Parameters.

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Introduction Upload Data Define Model **Analysis** Diagnostics Variable Selection Help

Table of Analysis of Variance

	Sum_of_Squares	DF	Mean_Square	F_Value	P_value
Model	277.946	2	138.973202	222.471	6.4997e-18
Error	17.491	28	0.624679		

Summary Statistics

	Root_MSE	R_square	Adj_R_square
	0.790366	0.940796	0.936567

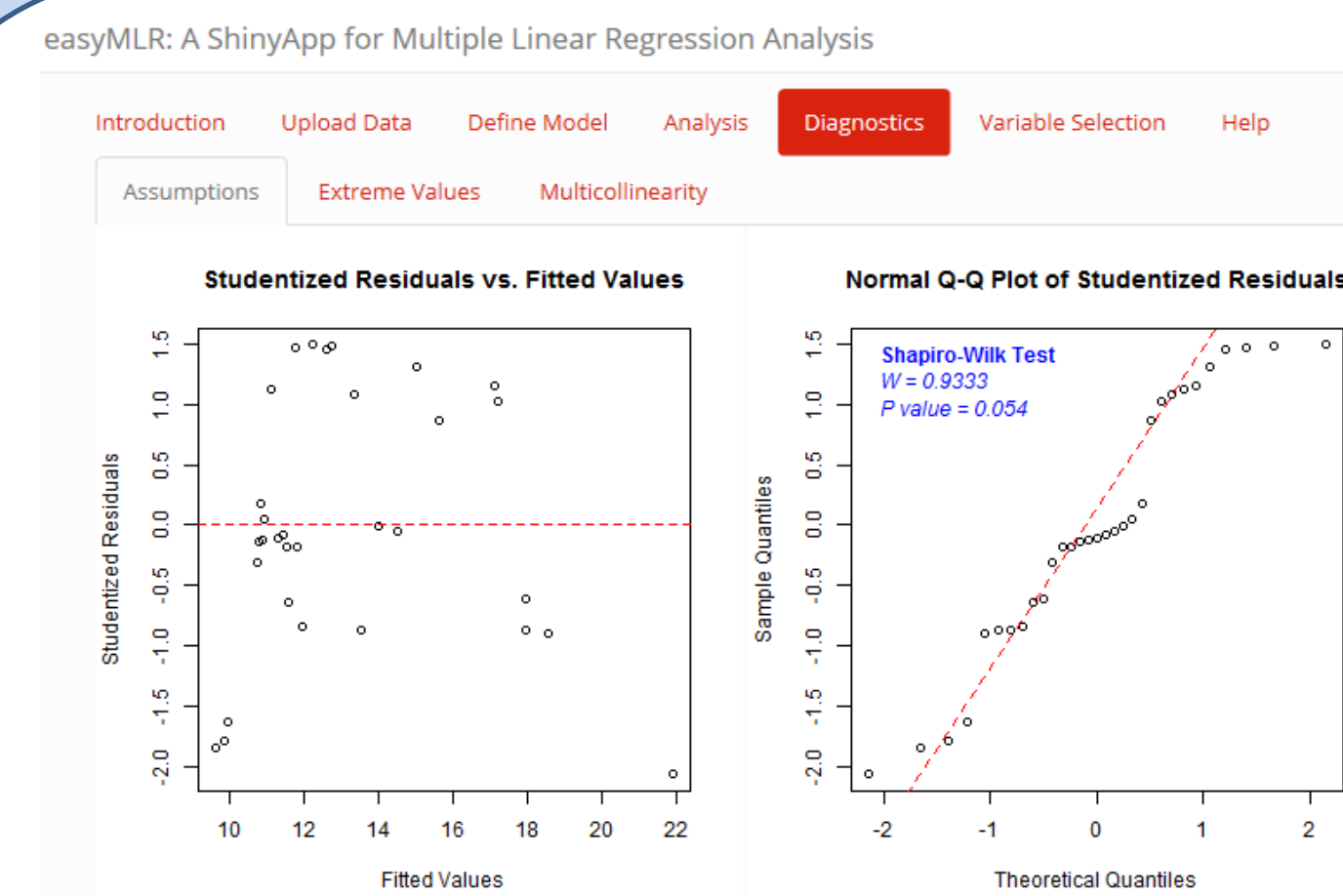
Table of Estimated Parameters

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	10.816371	1.973196	5.481651	0.000007
Height	-0.045483	0.028262	-1.609346	0.118759
Volume	0.195180	0.010955	17.816084	0.000000

## DIAGNOSTICS

This tab shows three common diagnostics as follows.

- Validation of Assumptions
- Extreme values
- Multicollinearity



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Introduction Upload Data Define Model Analysis **Diagnostics** Variable Selection Help

Assumptions **Extreme Values** Multicollinearity

Cut points:

- 1) |Stud\_Res| > 3 -> Outlier
- 2) Hat\_values > 2 \* p/n = 0.1935484 -> High Leverage
- 3) |Dffits| > 2 \* sqrt(p/n) = 0.622171 -> Influential, or Cook\_D > 1 -> Influential

Obs Stud\_Res Dffits Cook\_D Hat\_values

1	-1.849883	-0.558173	0.095584	0.083446
2	-1.793324	-0.789026	0.152666	0.133210
3	-1.633146	-0.741761	0.173097	0.171012
4	-0.310742	-0.076031	0.001991	0.056485
5	-0.134805	-0.050434	0.000879	0.122783
6	-0.116955	-0.050938	0.000896	0.159445
7	0.185936	0.066862	0.001543	0.114503
8	0.054445	0.013004	0.000058	0.053970

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Introduction Upload Data Define Model Analysis **Diagnostics** Variable Selection Help

Assumptions **Extreme Values** Multicollinearity

Estimated and standardized coefficients, their 95% CI's and VIF's

	Estimation	Coef.Std	Limit_2.5%	Limit_97.5%	Vif
(Intercept)	10.81637050	0.00000000	6.7744625	14.85827852	0.000000
Height	-0.04548349	0.02825166	-0.1033758	0.01240879	1.557396
Volume	0.19517975	0.01095587	0.1727389	0.21762857	1.557396

Collinearity Diagnostics

	Eigen_Value	Condition_Index	Intercept	Height	Volume
1	2.8540218	1.000000	0.000616	0.000523	0.015876
2	0.1436164	4.457863	0.007488	0.003428	0.677158
3	0.0023619	34.761531	0.991896	0.996048	0.306966

## VARIABLE SELECTION

This tab shows four variable selection methods such as the all possible regression models, and the sequential variable selection methods: forward, backward and stepwise.

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All Regressions **Forward** Backward Stepwise

k	R_square	adj_R_square	SSE	MSE	Cp	Variables_in_model
1	0.935	0.933	19.109	0.659	3.590	Volume
2	0.270	0.244	215.772	7.440	318.413	Height
3	0.941	0.937	17.491	0.625	3.000	Height Volume

Plot Criteria

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All Regressions **Forward** Backward Stepwise

Significance Level for Entry: 0.01 0.05 0.15

```

Estimate Std. Error t value Pr(>|t|)
(Intercept) 13.24839 0.5632623 23.50562 7.042539e-21
S = 3.138139, R-sq = 0.000000, R-sq(adj) = 0.000000, C-p = 443.942699
----
*** Adding Volume
Estimate Std. Error t value Pr(>|t|)
(Intercept) 7.677870 0.308620156 24.87737 4.114838e-21
Volume 0.1846321 0.009015995 20.47829 8.644334e-19
S = 0.811744, R-sq = 0.935320, R-sq(adj) = 0.933090, C-p = 3.580994
-----

```

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All Regressions **Forward** Backward Stepwise

Significance Level for Stay: 0.01 0.05 0.15

```

-----STEP 1-----
The drop statistics :
Single term deletions

Model:
Girth ~ Height + Volume
Df Sum of Sq  RSS  AIC F value Pr(>F)
<none>                17.491 -11.741
Height 1  1.618  19.109 -10.999  2.59 0.1188
Volume 1  198.281 215.772  64.147 317.41 <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

-----STEP 2-----
The drop statistics :
Single term deletions

Model:
Girth ~ Volume
Df Sum of Sq  RSS  AIC F value Pr(>F)
<none>                19.109 -10.999

```

## REFERENCES

- CANAVOS, George C. *Probabilidad y Estadística. Aplicaciones y Métodos*. McGraw-Hill.
- DEVORE, Jay L. *Probabilidad y Estadística para Ingeniería y Ciencias*. International Thomson.
- NETER, N. et. Al. (1996) *Applied Linear Statistical Models*. Irwin.