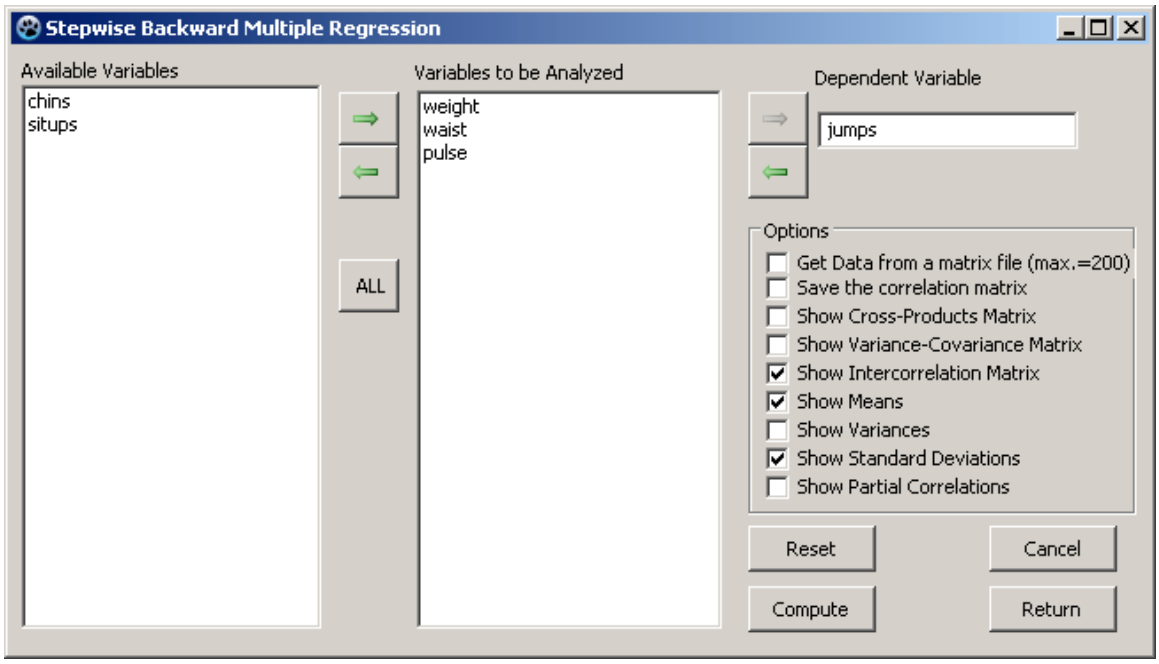
Backward Stepwise Multiple Regression

In the backward stepwise multiple regression, all independent variables are regressed on the dependent variable. The partial correlation of each independent variable is calculated and the variable with the lowest contribution to the dependent variable's variance is eliminated. This continues to the last variable.

As an example, we will use the cansas.LAZ file. Here then is the dialog and results:

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Step Backward Multiple Regression by Bill Miller

----------------- STEP   1 ------------------

Product-Moment Correlations Matrix with   20 cases.


Variables
                weight        waist        pulse        jumps
    weight       1.000        0.870       -0.366       -0.226
     waist       0.870        1.000       -0.353       -0.191
     pulse      -0.366       -0.353        1.000        0.035
     jumps      -0.226       -0.191        0.035        1.000



Means with   20 valid cases.

Variables       weight        waist        pulse        jumps
               178.600       35.400       56.100       70.300


Standard Deviations with   20 valid cases.

Variables       weight        waist        pulse        jumps
                24.691        3.202        7.210       51.277

Determinant of correlation matrix =   0.1977

SOURCE    DF        SS      MS        F        Prob.>F
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Regression   3  2692.894   897.631     0.304     0.822
Residual    16 47265.306  2954.082
Total       19 49958.200

Dependent Variable: jumps

       R        R2         F     Prob.>F  DF1  DF2
   0.232     0.054     0.304     0.822    3   16
Adjusted R Squared = -0.123

Std. Error of Estimate =     54.351

Variable       Beta      B         Std.Error t         Prob.>t   VIF       TOL
    weight    -0.259    -0.538     1.034    -0.520     0.610     4.189     0.239
     waist     0.015     0.234     7.928     0.029     0.977     4.144     0.241
     pulse    -0.055    -0.389     1.863    -0.209     0.837     1.161     0.861

Constant =    179.887
Variable 2 (waist) eliminated

----------------- STEP   2 ------------------

Product-Moment Correlations Matrix with   20 cases.


Variables
                weight        pulse        jumps
    weight       1.000       -0.366       -0.226
     pulse      -0.366        1.000        0.035
     jumps      -0.226        0.035        1.000




Means with   20 valid cases.

Variables       weight        pulse        jumps
               178.600       56.100       70.300


Standard Deviations with   20 valid cases.

Variables       weight        pulse        jumps
                24.691        7.210       51.277

Determinant of correlation matrix =   0.8196

SOURCE    DF        SS      MS        F        Prob.>F
Regression   2  2690.325  1345.162     0.484     0.625
Residual    17 47267.875  2780.463
Total       19 49958.200

Dependent Variable: jumps

       R        R2         F     Prob.>F  DF1  DF2
   0.232     0.054     0.484     0.625    2   17
Adjusted R Squared = -0.057

Std. Error of Estimate =     52.730

Variable       Beta      B         Std.Error t         Prob.>t   VIF       TOL
    weight    -0.246    -0.512     0.526    -0.972     0.344     1.154     0.866
     pulse    -0.055    -0.393     1.803    -0.218     0.830     1.154     0.866

Constant =    183.762

----------------- STEP   3 ------------------

Product-Moment Correlations Matrix with   20 cases.
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Variables

	weight	jumps
weight	1.000	-0.226
jumps	-0.226	1.000

Means with 20 valid cases.

Variables	weight	jumps
	178.600	70.300

Standard Deviations with 20 valid cases.

Variables	weight	jumps
	24.691	51.277

Determinant of correlation matrix = 0.9488

SOURCE	DF	SS	MS	F	Prob.>F
Regression	1	2558.343	2558.343	0.972	0.337
Residual	18	47399.857	2633.325		
Total	19	49958.200			

Dependent Variable: jumps

R	R2	F	Prob.>F	DF1	DF2
0.226	0.051	0.972	0.337	1	18

Adjusted R Squared = -0.002

Std. Error of Estimate = 51.316

Variable	Beta	B	Std.Error	t	Prob.>t	VIF	TOL
weight	-0.226	-0.470	0.477	-0.986	0.337	1.000	1.000

Constant = 154.237