Multiple linear regression (Stepwise regression with forward selection)

Data set

Y	**A**	**B**	**C**	**D**
12	4	4	7	8
13	5	3	7	1
14	4	3	7	9
16	4	5	6	1
15	6	4	7	10
18	5	5	6	2
20	7	4	6	9
19	9	5	6	1
18	8	8	7	11
22	7	8	6	2

Commands for SYSTAT 5.03 for Windows

Input each variable in a separate column, with values for the same experimental or sampling unit across the same row.

In the SYSTAT **Main** window, go to **Stats**, then to **MGLH,** and then to **Regression**.

Select the appropriate **Dependent** and **Independent** variables.

Check the **Include constant** option.

Check the **Stepwise on** option.

Type **0.05** for both *p* to **Enter** and *p* to **Remove**. These values are recommended when the independent variables are correlated.

Click **OK**. Done!

Alternatively, you could choose which variable to enter or remove in each subsequent step by initially checking the **Interactive** option in the **Regression** window.

SYSTAT output for Multiple Linear Regression
(stepwise, forward selection)

```
DEPENDENT VARIABLE        Y

MINIMUM TOLERANCE FOR ENTRY INTO MODEL =  0.010000



STEP #    0   R= 0.000   RSQUARE=  0.000

VARIABLE            COEFFICIENT    STD ERROR  STD COEF TOLERANCE    F    'P'

IN
---
  1 CONSTANT

OUT                  PART. CORR
---
  2 A                    0.704         .            .  .1E+01    7.850   0.023
  3 B                    0.685         .            .  .1E+01    7.056   0.029
  4 C                   -0.750         .            .  .1E+01   10.272   0.013
  5 D                   -0.190         .            .  .1E+01    0.300   0.599



STEP #    1   R= 0.750   RSQUARE=  0.562
TERM ENTERED: C

VARIABLE           COEFFICIENT    STD ERROR  STD COEF TOLERANCE    F    'P'

IN
---
  1 CONSTANT
  4 C                   -4.600        1.435    -0.750  .1E+01   10.272   0.013

OUT            semi PART. CORR
---
  2 A                    0.764         .            . 0.91349    9.821   0.017
  3 B                    0.734         .            . 0.91349    8.166   0.024
  5 D                    0.469         .            . 0.65385    1.974   0.203
```

STEP # 2 R= 0.904 RSQUARE= 0.818
TERM ENTERED: A

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	F	'P'
IN						
---						
1 CONSTANT						
2 A	0.955	0.305	0.529	0.91349	9.821	0.017
4 C	-3.645	1.036	-0.594	0.91349	12.391	0.010
OUT	semi PART. CORR					
---						
3 B	0.622	.	.	0.67815	3.794	0.099
5 D	0.424	.	.	0.60664	1.318	0.295

THE SUBSET MODEL INCLUDES THE FOLLOWING PREDICTORS:

CONSTANT
A
C

DEP VAR: Y N: 10 MULTIPLE R: 0.904 SQUARED MULTIPLE R: 0.818
ADJUSTED SQUARED MULTIPLE R: 0.766 STANDARD ERROR OF ESTIMATE: 1.565

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	34.764	7.477	0.000	.	4.649	0.002
A	0.955	0.305	0.529	0.913	3.134	0.017
C	-3.645	1.036	-0.594	0.913	-3.520	0.010

ANALYSIS OF VARIANCE for R^2

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	76.955	2	38.477	15.709	0.003
RESIDUAL	17.145	7	2.449		