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DECUS NO.	FOCAL8-74
TITLE	LINEAR LEAST SQUARES FIT
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DATE	December 11, 1969
SOURCE LANGUAGE	FOCAL

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A SHORT, SIMPLE LINEAR SQUARES FIT FOR FOCAL

DECUS Program Library Write-up

DECUS No. FOCAL8-74

A least squares fit to a straight line is presented here, along with a sample of the output, because it is shorter and easier to use than many of those in the DECUS library. The input is designed to accept data from the high-speed reader, and the two dummy X's in 1.1 are for the initial carriage-return and = sign (produced by FOCAL). If data are to be typed in from the teletype, eliminate everything in 1.1 from the first asterisk up to the semicolon before A X(I). Also eliminate the last asterisk. The program expects to have the number of points to be fitted typed into the keyboard before it begins. It runs in just a few seconds, and can fit approximately 80 pairs of points in 4K FOCAL without functions.

C-FOCAL, 1969

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Ø1.1Ø A !!!, "NUMBER OF POINTS", N;*;A X,X;*;F I=1, N;*;A X(I);A Y(I);*
Ø1.15 S H=Ø;S HH=Ø;S V=Ø;S HV=Ø;S DD=Ø
Ø1.2Ø F I=1, N;S H=H+X(I);S HH=HH+X(I)↑2;S V=V+Y(I);S HV=HV+X(I)*Y(I)
Ø1.3Ø S DN=N*HH-H*H;S SL=(N*HV-H*V)/DN;S IN=(V*HH-H*HV)/DN
Ø1.4Ø F I=1, N;S DD=DD+(Y(I)-SL*X(I)-IN)↑2
Ø1.5Ø S DSL=N*DD/((N-2)*DN);S DIN=FSQT(DSL*HH/N);S DSL=FSQT(DSL)
Ø1.6Ø T !!!, " THE SLOPE IS ", SL, " AND INTERCEPT IS ", IN
Ø1.61 T !, "UNCERTAINTY IS ", DSL, " AND " , DIN, !!!
Ø1.65 T " I X(I) Y(I)", !;F I=1, N;T I, X(I), Y(I), !
*
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GO

NUMBER OF POINTS:5 : : : : : : : : : :

THE SLOP IS = 2.ØØ56 AND INTERCEPT IS == Ø.Ø924
 UNCERTAINTY IS = Ø.Ø132 AND = Ø.Ø789

	I	X(I)	Y(I)
=	1.ØØØØ=	2.Ø1ØØ=	3.89ØØ
=	2.ØØØØ=	4.25ØØ=	8.36ØØ
=	3.ØØØØ=	8.27ØØ=	16.6ØØØ
=	4.ØØØØ=	9.55ØØ=	19.ØØØØ
=	5.ØØØØ=	1.38ØØ=	2.75ØØ

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