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Least-Squares Fit to Straight Line

Given a vector of values Y measured at the points X, LFIT and LFITW find the best least-squares fit to the linear relationship $Y = aX + b$. LFIT performs an unweighted fit and LFITW takes account of a given vector of weights. Both subroutines have an option for skipping missing points without shifting the points of the vector X.

Structure:

SUBROUTINE subprogram
User Entry Names: LFIT, LFITW

Usage:

```
CALL LFIT(X,Y,L,KEY,A,B,VAR)      or
CALL LFITW(X,Y,W,L,KEY,A,B,VAR)
```

X (REAL) Vector of abscissae.

Y (REAL) Vector of values corresponding to points X.

W (REAL) Vector of weights (for LFITW only).

L (INTEGER) Length of vectors X, Y and W.

KEY (INTEGER)
= 0 : indicates that any points where Y = 0 are to be skipped,
= 1 : indicates that all L points are to be used.

A (REAL) Fitted slope a.

B (REAL) Fitted constant term b.

VAR (REAL) Residual sum of squares divided by (L − 2) indicating the badness of fit.

References:

1. D.H. Menzel, Fundamental Formulas of Physics, Dover Publ., New York (1960) 116.

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