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DECUS NO.	8-320
TITLE	MMMS (Calculation of Minimum, Mean, Maximum and Standard Deviation)
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SOURCE LANGUAGE	FORTRAN D

MMMS (Calculation of Minimum, Mean, Maximum and Standard Deviation)

DECUS Program Library Write-up

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ABSTRACT

The program calculates the minimum, arithmetic mean, maximum, and standard deviation of any number of sets of up to 20 variables, presented in a standard order. It is intended as a simple method of summarizing multivariate data, and is used as an auxilliary program for other multivariate programs, for example, the CCMP program.

TAPES REQUIRED

1. Form of program tape - The program is written in the PDP-8 FORTRAN-D language, and is in the source language.

2. Form of data tape - The data to be analyzed should be punched onto paper tape in the ASCII code. The data for the several variables should be entered in a standard order, e.g.

129	83	65	7	
125	74	65	8	
138	88	57	6	
113	95	62	5	
149	74	100	5	etc.

Numbers may be entered as indices or decimal numbers, or, if required, as floating point numbers with exponents.

OPERATING INSTRUCTIONS

Normal for the disk operating system. The data tape should be loaded into the high-speed reader before continuing after the teletype has printed READY. The program will request the entry of the number of variables and sets, and these should be entered on the teletype and each number terminated by either space or new line.

OUTPUT

The program prints the minimum, the arithmetic mean, the maximum, and the standard deviation for each variable included in the data.

STORAGE AND LIMITATIONS

Normal for FORTRAN-D. The number of variables must not exceed 20 in the present program, but this restriction could easily be relaxed by changing the DIMENSION statement at the beginning of the program. There is no limit to the number of sets.

METHOD

The program employs the efficient, single-pass system for the computation of the corrected sum of squares of deviations and the arithmetic mean.

MMMS

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L
C       PROGRAM TO COMPUTE MINIMUM, MEAN, MAXIMUM, STANDARD DEVIATION
        DIMENSION X(2Ø),SX(2Ø),XMIN(2Ø),XMAX(2Ø), SD(2Ø)
        TYPE 1Ø1
1Ø1     FORMAT (/,"ENTER NO OF VARIABLES AND SETS",/)
        ACCEPT 1Ø2,M,N
1Ø2     FORMAT (I,I)
        DO 1Ø I=1,M
        SX(I)=Ø.Ø
        XMIN(I)=1.ØE+9
        XMAX(I)=-1.ØE+9
        SD(I)=Ø.Ø
1Ø      CONTINUE
        DO 2Ø I=1,N
        EI=I
        DO 2Ø J=1,M
        READ 2,1Ø3,X(J)
1Ø3     FORMAT (E)
        IF (X(J)-XMIN(J) ) 1,2,2
1       XMIN(J)=X(J)
2       IF (X(J)-XMAX(J) ) 3,3,4
4       XMAX(J)=X(J)
3       SD(J)=SD(J)+(X(J)-SX(J) )*(X(J)-SX(J) )*(1.Ø-1.Ø/EI)
        SX(J)=SX(J)+(X(J)-SX(J) )/EI
2Ø      CONTINUE
        EN=N
        DO 3Ø I=1,M
        SD(I)=SQTF( (SD(I) )/(EN-1.Ø) )
        WRITE 1, 1Ø4,I,XMIN(I),SX(I),XMAX(I),SD(I)
1Ø4     FORMAT (I,E,E,E,E)
3Ø      CONTINUE
        STOP
        END

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