<table>
<thead>
<tr>
<th>DECUS NO.</th>
<th>FOCAL8-167</th>
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<tr>
<td>TITLE</td>
<td>FIVE STATISTICAL PROGRAMS FOR THE PDP-8 OR PDP-12</td>
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<tr>
<td>AUTHOR</td>
<td>Stephen J. Mayor, Ph.D.</td>
</tr>
<tr>
<td>COMPANY</td>
<td>Medical College of Ohio</td>
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<td>Toledo, Ohio</td>
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<td>DATE</td>
<td>April 30, 1971</td>
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<td>SOURCE LANGUAGE</td>
<td>FOCAL '69</td>
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NOTE: These programs cannot be chained together if only 4K of core is available, but may be chained using FOCAL for 8K.
STUDENT'S T TEST

DECUS Program Library Write-up

ABSTRACT

This program calculates Student's t of data entered through teletype reader or keyboard and prints out the t value and degrees of freedom.

C-FOCAL, 1969

12.10 TYPE "STUDENT'S T TEST"
12.20 ask !!"ENTER GROUP 1 DATA",!,"AV",X1,"STD. DEV.",S1,"N",N1
12.40 SET SP=SQRT((N1-1)*S1^2+(N2-1)*S2^2)/(N1+N2-2))
12.50 SET D=SQRT(1/N1+1/N2)
12.60 TYPE 44.33,!!"T SCORE",(X1-X2)/SP*D
12.70 TYPE,!!"DEGREES OF FREEDOM",(N1+N2-2)

*
DUNNETT’S T-TEST

DECUS Program Library Write-up

ABSTRACT

Dunnett’s t-test is similar to Student’s except that the former allows for multiple comparisons to a single group (i.e., the control group). Data is inputted through the teletype reader or keyboard. It prints out Dunnett’s t values between control group and each experimental group and the degrees of freedom between and within groups.

C-FOCAL, 1969

07.01 TYPE "DUNNETT’S T TEST"
07.10 ASK,"!!", "NO. OF SAMPLES IN CTL GROUP", NC
07.20 ASK "CTL GROUP MEAN", XC
07.30 ASK,"!!", "NUMBER OF EXPTL GROUPS", NE
07.40 TYPE "NO. OF SAMPLES IN EACH EXPTL GRP"
07.50 FOR I=1,NE;ASK NE(I)
07.60 TYPE "EXPTL GROUP MEANS"
07.70 FOR I =1,NE;ASK XE(I)
07.71 ASK,"!!", "WITHIN GROUP MEANS SQUARED", MW
07.72 FOR I=1,NE;DO 8
07.80 SET SN=0
07.81 FOR I=1,NE;SET SN=SN+NE(I)
07.82 SET XG=NC+SN-NE-1
07.83 T="!!","DEGREES OF FREEDOM BETWEEN GROUPS", NE
07.84 T="!!","DEGREES OF FREEDOM WITHIN GROUPS ", XG
07.85 QUIT

08.10 SET A(I)=MW*<NC+NE(I)>/(NC*NE(I))
08.20 SET T(I)=<XC-XE(I)>/FSQRT<A(I)>
08.30 T="!!","DUNNETT’S T SCORE BETWEEN CTL GRP & GROUP", I," IS", T(I)
08.40 RETURN
*
NORMALIZED PLOT ROUTINE

ABSTRACT

Data to be plotted must be entered through teletype reader or keyboard in the exact sequence to be plotted. Once the data is normalized the y-coordinate proceeds horizontally and the x-coordinate is produced in equal vertical increments using the carriage return and line feed.

C-FOCAL, 1969

09.10 TYPE "NORMALIZED DATA PLOT"
09.20 ASK, !!, "SIZE OF DATA FIELD", N
09.30 TYPE "ENTER DATA"
09.40 FOR I = 1, N: ASK X(I)
09.50 ASK "LARGEST VALUE IN DATA FIELD", L
09.60 FOR I = 1, N: TYPE "*", ! FOR .I = L, <X(I)/L>*64: TYPE " " " *
ABSTRACT

The mean and standard deviation of data entered through teletype reader or keyboard will be calculated by this program.

C-FOCAL, 1969

@1.10 TYPE "MEAN & STANDARD DEVIATION CALCULATION"
@1.20 ASK,, "GROUP SIZE", N
@1.25 TYPE "GROUP DATA"
@1.30 FOR I=1,N; ASK X(I)
@1.40 SET SX=0
@1.50 FOR I=1,N; SET SX=SX+X(I)
@1.55 SET SXX=0
@1.60 FOR I=1,N; SET SXX=SXX+X(I)^2
@1.70 TYPE 44,02,!,"MEAN ",SX/N
@1.80 TYPE 44,02,!,"S.D. ",FSQRT<(SXX-(SX^2/N))/(N-1)>
@1.90 ERASE
@1.95 GOTO 1.2

*
ANALYSIS OF VARIANCE FOR SINGLE VARIABLE OF CLASSIFICATION

DECUS Program Library Write-up

DECUS NO. FOCAL8-167.5

ABSTRACT

This program calculates analysis of variance of data entered through teletype reader or keyboard. It prints out F score, degrees of freedom between and within groups and the within group means squared.

C-FOCAL, 1969

03.01 TYPE "ANALYSIS OF VARIANCE"
03.10 ASK "NO. OF GROUPS", G
03.20 SET SN=0
03.30 FOR I=1,G DO 4
03.40 GOTO 5,1

04.10 TYPE,!, "GROUP", I, "SIZE"
04.12 ASK N(I)
04.20 SET SN=SN+N(I)
04.21 TYPE "GROUP DATA", I
04.30 FOR C=1,N(I) DO 3
04.40 SET SJM(I)=0
04.50 FOR C=1,N(I) DO 3
04.60 SET IDS(I)=0
04.70 FOR C=1,N(I) DO 3
04.80 RETURN

05.10 SET DCF=0
05.20 FOR I=1,G DO 5
05.30 SET CF=DCF+FS(I)
05.40 SET SSX=0
05.50 FOR I=1,G DO 5
05.60 SET TSS=SSX+CF
05.70 SET PBS=0
05.80 FOR I=1,G DO 5
05.90 SET BSS=PBS-CF

06.10 SET WSS=TSS-BSS
06.20 SET DB=G-1
06.30 SET MB=BSS/DB
06.40 SET DW=SN-G
06.50 SET MW=WSS/DW
06.60 TYPE,1!,F SCORE", MB/MW
06.70 T,!, DEGREES OF FREEDOM BETWEEN GROUPS", DB
06.71 T,!, DEGREES OF FREEDOM WITHIN GROUPS", DW
06.72 T,!, WITHIN GROUP MEANS Squared", MW
06.73 QUIT

*