



# DECUS

## PROGRAM LIBRARY

DECUS NO.	FOCAL8-167
TITLE	FIVE STATISTICAL PROGRAMS FOR THE PDP-8 OR PDP-12
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DATE	April 30, 1971
SOURCE LANGUAGE	FOCAL '69

**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

DECUS NO. FOCAL8-167.1

## 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

```
02.10 TYPE "STUDENT'S T TEST"  
02.20 ASK !! "ENTER GROUP 1 DATA",!, "MEAN", X1, "STD. DEV.", S1, "N", N1  
02.30 ASK !! "ENTER GROUP 2 DATA",!, "MEAN", X2, "STD. DEV.", S2, "N", N2  
02.40 SET SP=FSQRT((N1-1)*S1^2+(N2-1)*S2^2)/(N1+N2-2)  
02.50 SET D=FSQRT(1/N1+1/N2)  
02.60 TYPE %4.03, !!, "T SCORE", (X1-X2)/SP*D  
02.70 TYPE,!, "DEGREES OF FREEDOM", (N1+N2-2)  
*
```

## DUNNETT'S T-TEST

DECUS Program Library Write-up

DECUS NO. FOCAL8-167.2

### 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 GROJP"
07.50 FOR I=1,NE;ASK NE(I)
07.60 TYPE "EXPTL GROJP MEANS"
07.70 FOR I =1,NE;ASK XE(I)
07.71 ASK,!, "WITHIN GROJP MEANS SQUARED",MW
07.72 FOR I=1,NE;DO 3
07.80 SET SN=0
07.81 FOR I=1,NE;SET SN=SN+NE(I)
07.82 SET NG=NC+SN-NE-1
07.83 T,!!,"DEGREES OF FREEDOM BETWEEN GROUPS",NE
07.84 T,!!,"DEGREES OF FREEDOM WITHIN GROUPS ",NG
07.85 QUIT

08.10 SET A(I)=MW* <NC+NE(I)>/<NC*NE(I)>
08.20 SET F(I)=<XC-XE(I)>/FSQT<A(I)>
08.30 T,!!,"DUNNETT'S T SCORE BETWEEN CTL GROJP & GROJP",I," IS",T(I)
08.40 RETURN
*
```

## NORMALIZED PLOT ROUTINE

DECUS Program Library Write-up

DECUS NO. FOCAL8-167.3

### 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 J=0,<X(I)/L,>*60;TYPE " "  
*
```

## MEAN AND STANDARD DEVIATION

DECUS Program Library Write-up

DECUS NO. FOCAL8-167.4

### ABSTRACT

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

C-FOCAL, 1969

```
01.10 TYPE "MEAN & STANDARD DEVIATION CALCULATION"  
01.20 ASK,!!,"GROUP SIZE",N  
01.25 TYPE "GROUP DATA"  
01.30 FOR I=1,N;ASK X(I)  
01.40 SET SX=0  
01.50 FOR I=1,N;SET SX=SX+X(I)  
01.55 SET SQX=0  
01.60 FOR I=1,N;SET SQX=SQX+X(I)*2  
01.70 TYPE %4.02,!, "MEAN ",SX/N  
01.80 TYPE %4.02,!, "S.D. ",FSQRT<(SQX-(SX*2/N))/(N-1)>  
01.90 ERASE  
01.95 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);ASK SAM(C)
04.40 SET SUM(I)=0
04.50 FOR C=1,N(I);SET SUM(I)=SUM(I)+SAM(C)
04.60 SET IDS(I)=0
04.70 FOR C=1,N(I);SET IDS(I)=SAM(C)2+IDS(I)
04.80 RETJRN

05.10 SET DCF=0
05.20 FOR I=1,G;SET DCF=DCF+SUM(I)
05.30 SET CF=DCF2/SN
05.40 SET SSX=0
05.50 FOR I=1,G;SET SSX=SSX+IDS(I)
05.60 SET TSS=SSX-CF
05.70 SET PBS=0
05.80 FOR I=1,G;SET PBS=PBS+SUM(I)2/N(I)
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 %4.03,!, "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
*
```

