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DECUS NO.	8-325
TITLE	SBSM - Calculation of Duplicate Sub-Samples from Primary Data
AUTHOR	A. J. P. Gore
COMPANY	The Nature Conservancy Lancashire, England
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SOURCE LANGUAGE	FORTRAN D

SBSM - Calculation of Duplicate Sub-Samples from Primary Data

DECUS Program Library Write-up

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ABSTRACT

This program is designed for use following a standard sub-sampling routine. Such a routine takes duplicate sub-samples from samples of materials which would be too laborious to sort completely. It specifically refers to mixed vegetation cropped from quadrats of given size but could be applied to any analogous sampling situation. A sub-sub-sampling procedure is incorporated to allow for materials within the sub-samples which are still too laborious to sort, in this specific instance, live and dead plant parts. The output data can be used in an analysis of variance to test for effects of both sampling and sub-sampling, the AVSC program is suitable for this procedure.

TAPES REQUIRED

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

2. Form of data tape - The data to be analyzed should be punched on paper tape in ASCII code.

In its present version:

Line 1	The first three numbers (integers) on the tape are for labelling purposes, i.e. Date (Year) Plot, Block
Line 2	The number of samples follows.
Line 3	Then the weight (or other real number index) of the sample remaining after sub-sampling; the weights of the two sub-samples remaining after sub-sub-sampling if any, zeros (real) if none; four integer numbers indicating number of items for which i) sub-sub-samples were taken in the first replicate ii) sub-samples were taken in the first replicate, iii) sub-sub-samples were taken in the second replicate, iv) sub-samples were taken in the second replicate. If no sub-sub-sampling was carried out zeros (integer) must be entered in i) and iii).
Lines 4-7	Entry on the next four lines is for the weights of the i), ii), iii) and iv) items respectively.
Lines 3-7	Are repeated to the number of samples e.g. for a case of three samples each having two items for sub-sub-sampling and three for sub-sampling:

```
1968        5        2
 3
130.0       1.2561   1.1815   2   3   2   3
 0.0781     0.0938
 0.5131     0.1675   0.3628
 0.1110     0.0996
 0.6844     0.0773   0.2516
 88.0       2.7774   2.4736   2   3   2   3
 0.1396     0.4796
 0.1902     2.0587   0.2790
 0.1027     0.2969
 0.1709     2.1517   0.1310
 40.0       1.5520   1.7434   2   3   2   3
 0.0660     0.2146
 0.2483     0.4110   0.1989
 0.0588     0.2383
 0.2058     0.7167   0.1137
```

OPERATING INSTRUCTIONS

```
.FORT
*OUT - S:SBSM
*
*IN - R:
*
↑               Data tape in high speed reader
*READY
↑
```

If the program has already been compiled onto the disk, it may be called back into core as follows:

```
.FOSL
*IN - S:SBSM
*
*OPT-
* ↑             Date tape in high speed reader
*READY
↑
```

OUTPUT

The program prints the coding of the samples, followed by the sample numbers, then the replicate A and B item values which were sub-sub-sampled followed by the A and B values for items which were sub-sampled, e.g. for the above data:

G.9 1968 PLOT 5 BLOCK 2

1	A 0.354076E+2	0.425254E+2	
1	B 0.411419E+2	0.369165E+2	
1	A 0.280024E+2	0.914132E+1	0.197998E+2
1	B 0.383760E+2	0.433440E+1	0.141078E+2
2	A 0.128287E+2	0.440734E+2	
2	B 0.137588E+2	0.397759E+2	
2	A 0.318636E+1	0.344887E+2	0.467400E+1
2	B 0.318428E+1	0.400914E+2	0.244085E+1
3	A 0.733161E+1	0.238388E+2	
3	B 0.600734E+1	0.243461E+2	
3	A 0.422330E+1	0.699065E+1	0.338306E+1
3	B 0.306138E+1	0.106621E+2	0.169134E+1

STORAGE AND LIMITATIONS

Normal for FORTRAN D. The maximum number of samples is 10. For more than 10 samples it would be necessary to run the program more than once. The maximum number of items sub-sub-sampled is 4 and the maximum number of items sub-sampled is 7.

```
L                                                        SBSM
C       PROGRAM TO CALCULATE D.M. YIELD (G/M2) EXPT G.9. WITH
C       TWO SUB SAMPLES FROM EACH OF N SAMPLES
        DIMENSION S1B(1),S2SB(2),ASSY(4),BSSZ(4),ASY(7)
        DIMENSION BSZ(7),ASYF(4),BSZF(4),ASYP(4),BSZP(4)
        DIMENSION AYF(7),BZF(7),SPA(4),SPB(4),SA(7),SB(7),TS(1Ø)
C       NA/B=NUMBER OF PARTS FOR LIVE AND DEAD, MA/B=NUMBER
C       OF SPECIES , JJ=YEAR, KK=PLOT, II=BLOCK,MM=NUMBER OF SAMPLES
C       S1B=MAIN SAMPLE, S2SB=SUB-SUB-SAMPLES BULK REMAINDER
C       A/BSSY/Z=SUB-SUB-SAMPLES FOR LIVE AND DEAD PARTS.
C       A/BSY/Z=SUB-SAMPLES FOR SPECIES.
C       A/BSY/ZF=FRACTION OF SUB-SAMPLE TAKEN FOR LIVE AND
C       DEAD ESTIMATES,A/BSY/ZP=WEIGHT OF LIVE AND DEAD IN SUB-
C       SAMPLE (FRACTION*SUB-SUB-SAMPLE TOTAL)
C       A/BY/ZF=FRACTION OF SUB-SAMPLE TAKEN FOR SPECIES
        II=Ø
        JJ=Ø
        KK=Ø
        MM=Ø
        READ 2, 2ØØ,JJ,KK,II
        READ 2, 2ØØ,MM
2ØØ     FORMAT (I,I,I)
        TYPE 2Ø1, JJ,KK,II
2Ø1     FORMAT (/,"YEAR.",I,"PLOT",I,"BLOCK",I)
        DO 91 N=1,MM
        TS(N)=Ø.Ø
        NA=Ø
        MA=Ø
        NB=Ø
        MB=Ø
        S1B(1)=Ø.Ø
        S2SB(1)=Ø.
        S2SB(2)=Ø.
        ASS1=Ø.
        BSS2=Ø.
        AST1=Ø.
        BST2=Ø.
        ST1=Ø.
        ST2=Ø
        DO 2Ø J=1,4
        ASSY(J)=Ø.Ø
        BSSZ(J)=Ø.Ø
        ASYF(J)=Ø.
        BSZF(J)=Ø.
        ASYP(J)=Ø.
        BSZP(J)=Ø.
        SPA(J)=Ø.
        SPB(J)=Ø.
```

```
20     CONTINUE
       DO 21 I=1,7
       ASY(I)=0.0
       BSZ(I)=0.0
       AYF(I)=0.
       BZF(I)=0.
       SA(I)=0.
       SB(I)=0.
21     CONTINUE
       READ 2,202,  S1B(1),   S2SB(1),S2SB(2), NA,MA,NB,MB
202    FORMAT (E,E,E,I,I,I,I)
       IF(NA)52,52,50
50     DO 22 J=1,NA
       READ 2,203, ASSY(J)
203    FORMAT(E,E,E,E,E,E)
       ASS1=ASS1+ASSY(J)
22     CONTINUE
       DO 32 J=1,NA
       ASYF(J)=ASSY(J)/ASS1
       AST1=ASS1+S2SB(1)
       ASYP(J)=ASYF(J)*AST1
32     CONTINUE
       GO TO 51
52     AST1=0.
51     DO 23 I=1,MA
       READ 2, 203, ASY(I)
       ST1=ST1+ASY(I)
23     CONTINUE
       DO 33 I=1,MA
       AYF(I)=ASY(I)/(ST1+AST1)
33     CONTINUE
       IF (NB)62,62,60
60     DO 24 J=1,NB
       READ 2, 203,BSSZ(J)
       BSS2=BSS2+BSSZ(J)
24     CONTINUE
       DO 34 J=1,NB
       BSZF(J)=BSSZ(J)/BSS2
       BST2=BSS2+S2SB(2)
       BSZP(J)=BSZF(J)*BST2
34     CONTINUE
       GO TO 61
62     BST2=0.
61     DO 25 I=1,MB
       READ 2, 203,BSZ(I)
       ST2=ST2+BSZ(I)
25     CONTINUE
       DO 35 I=1,MB
       BZF(I)=BSZ(I)/(ST2+BST2)
```

```
35      CONTINUE
        TS(N)=ST1+AST1+ST2+BST2+S1B(1)
2Ø4     FORMAT(/, I, "A")
        TYPE 2Ø4, N
21Ø     FORMAT(E, E, E, E,/)
        IF (NA)3ØØ, 3ØØ, 4ØØ
4ØØ     DO 26 J=1, NA
        SPA(J) = ASYP(J)/(ST1+AST1)         *TS(N)
        GO TO 5ØØ
3ØØ     SPA(J)=Ø.
5ØØ     TYPE 21Ø, SPA(J)
26      CONTINUE
2Ø5     FORMAT(/, I, "B")
        TYPE 2Ø5, N
        IF (NB)3Ø1, 3Ø1, 4Ø1
4Ø1     DO 27 J=1, NB
        SPB(J)=BSZP(J)/(ST2+BST2)*TS(N)
        GO TO 5Ø1
3Ø1     SPB(J)=Ø.
5Ø1     TYPE 21Ø, SPB(J)
27      CONTINUE
        TYPE 2Ø4, N
212     FORMAT(E, E, E, E,/)
        DO 28 I = 1, MA
        SA(I) = AYF(I)*TS(N)
        TYPE 212, SA(I)
28      CONTINUE
        TYPE 2Ø5, N
        DO 91 I= 1, MB
        SB(I) = BZF(I)*TS(N)
        TYPE 212, SB(I)
91      CONTINUE
        END
```

*