

THE UNIVERSITY OF TEXAS
BUREAU OF ECONOMIC GEOLOGY
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AUGUST 1961

BUREAU OF ECONOMIC GEOLOGY
PROGRAM NUMBER EG-001
CODE NAME FOSSILS

CALCULATE TWENTY RATIOS OF FIVE MEASUREMENTS
FROM FOSSIL SHELLS AND
SUMMARIZE EACH OF THE MEASURED AND CALCULATED DATA WITH
ARITHMETIC MEAN AND STANDARD DEVIATION

PROGRAM FOSSILS
CALL TIME (1HP)

PROGRAM REQUIREMENTS

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0 DIMENSION A(14,400), B(13,400), C(6,26), T(26), U(26), V(26),  
1 W(26), LW(26), Y(26), Z(26), S(5)  
COMMON A, B, C, T, U, V, W, LW, Y, Z, S  
  Reserve cells in core.  
1 0 FORMAT(1H1 1X,/ 16X, 90H  CALCULATION OF RATIOS AND SIMPLF STATIS  
1 TICAL TFSTS ON MEASUREMENTS FROM FOSSIL SHELLS // 3A8, 5H RUN  
2 3A7, 10X, 60H  ANSWER BLOCK A BUREAU OF ECONOMIC  
3 GEOLOGY / 13H LOCALITY NO. I7, I11, 89H INDIVIDUALS MEASU  
4 RED DATA AND CALCULATED RATIOS THE UNIVERSITY OF TEXAS //  
5 120H IDENT. A B C D E A/B A/  
6 C B/C A/(D/E) B/(D/E) D/A D/B D/C /  
7 (I8, 2X, 5F7.0, 1X, 3F9.3, 2F9.2, 3F9.4))  
2 0 FORMAT(1H1 1X,/ 16X, 90H  CALCULATION OF RATIOS AND SIMPLE STATIS  
1 TICAL TFSTS ON MEASUREMENTS FROM FOSSIL SHELLS // 3A8, 5H RUN  
2 3A7, 10X, 60H  ANSWER BLOCK B BUREAU OF ECONOMIC  
3 GEOLOGY / 13H LOCALITY NO. I7, I11, 89H INDIVIDUALS  
4 CALCULATED RATIOS THE UNIVERSITY OF TEXAS //  
5 120H IDENT. D/F C/(A/R) D/(A/R) F/(A/R) F/A  
6 E/R F/C A+B+C A/SUM B/SUM C/SUM (A/C)/SUM /  
7 (I8, 7F10.4, F7.0, 1X, 3F8.4, F9.5))  
3 0 FORMAT(1H1 1X,/ 16X, 90H  CALCULATION OF RATIOS AND SIMPLE STATIS  
1 TICAL TESTS ON MEASUREMENTS FROM FOSSIL SHELLS // 3A8, 5H RUN  
2 3A7, 10X, 60H  ANSWER BLOCK C BUREAU OF ECONOMIC  
3 GEOLOGY / 13H LOCALITY NO. I7, I11, 89H INDIVIDUALS  
4 STATISTICAL VALUES THE UNIVERSITY OF TEXAS //  
5 120H FACTOR ARITH. MEAN STD. DEV.  
6 SUM X SUM X*X N = NC /  
7 (3X, 2A7, 3F15.6, F17.6, F20.6, F10.0, I4))  
  Formats, answer blocks. 1--Block A, 2--Block B, 3--Block C.  
  
4 FORMAT(3A7, I9)  
7 FORMAT(10A7)  
5 FORMAT(3A8, I9, I7)  
14 FORMAT (I10, 5F10.1)  
  Formats, data cards. 4 and 7--Preliminary, 5--Block lead, 14--Specimen.
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PRELIMINARY CALCULATIONS

```
READ 4, DAA, DAB, DAC, L  
READ 7, (Y(I), Z(I), I= 2, 26, 1)  
  Transfer preliminary data from cards to core.  
  
IPA = -99  
DO 168 M= 1, L, 1  
  Run control loop. Repeat until L blocks are processed.
```

DATA INPUT

```
READ 5, COA, COB, COC, IDB, K  
  TRANSFER LEAD DATA FROM CARD TO CORE.  
  
READ 14, ((A(I,J), I= 1, 6, 1), J= 1, K, 1)  
  TRANSFER SPECIMEN DATA FROM CARDS TO CORE.  
  
EN11(26), ENA(0).  
STA1(U), STA1(V), STA1(W), STA1(LW), IJP1(80).  
  Zero all cells in Blocks U, V, W, and LW.
```

SPECIMEN DATA CALCULATIONS

```
DO 159 J= 1, K, 1  
DO 81 I= 1, 6, 1  
81 T(I) = A(I,J)  
DO 82 I= 7, 26, 1  
LDA(IPA), STA1(T).  
82 CONTINUE  
  Transfer data for one specimen to cells 1-6 of Block T. Enter pass  
  symbol (IPA) in cells 7-26 of Block T.  
  
92 IF (T(2)) 72, 72, 62  
72 LDA(IPA), STA(T+2), SLJ(93).  
62 RAO(LW+2).  
93 IF (T(3)) 73, 73, 63  
73 LDA(IPA), STA(T+3), SLJ(94).  
63 RAO(LW+3).  
94 IF (T(4)) 74, 74, 64  
74 LDA(IPA), STA(T+4), SLJ(95).  
64 RAO(LW+4).  
95 IF (T(5)) 75, 75, 65  
75 LDA(IPA), STA(T+5), SLJ(96).  
65 RAO(LW+5).  
96 IF (T(6)) 76, 76, 66  
76 LDA(IPA), STA(T+6), SLJ(100).  
66 RAO(LW+6).  
  Test cells T2-T6. If entry indicates that measurement is not available,  
  substitute IPA for entry. Count measurements in Block LW.  
  
100 LDA(T+6), AJP3(129), LDA(T+2), AJP3(116), FDV(T+4), STA(T+8),  
RAO(LW+8), LDA(T+3), AJP3(110), FAD(T+2), FAD(T+4), STA(T+22),  
  
RAO(LW+22), LDA(T+2), FDV(T+22), STA(T+23), RAO(LW+23), LDA(T+3),  
FDV(T+22), STA(T+24), RAO(LW+24), LDA(T+4), FDV(T+22), STA(T+25),  
RAO(LW+25), LDA(T+8), FDV(T+22), STA(T+26), RAO(LW+26), LDA(T+2),  
FDV(T+3), STA(T+7), RAO(LW+7), LDA(T+3), FDV(T+4), STA(T+9),  
RAO(LW+9), LDA(T+4), FDV(T+7), STA(T+16), RAO(LW+16).  
104 LDA(T+5), AJP3(108), FDV(T+2), STA(T+12), RAO(LW+12), LDA(T+5),  
FDV(T+3), STA(T+13), RAO(LW+13), LDA(T+5), FDV(T+4), STA(T+14),  
RAO(LW+14), LDA(T+5), FDV(T+7), STA(T+17), RAO(LW+17).  
105 LDA(T+6), AJP3(150), FDV(T+4), STA(T+21), RAO(LW+21).  
106 LDA(T+5), FDV(T+6), STA(T+15), RAO(LW+15), LDA(T+2), FDV(T+15),  
STA(T+10), RAO(LW+10), LDA(T+3), FDV(T+15), STA(T+11), RAO(LW+11).  
107 LDA(T+6), FDV(T+7), STA(T+18), RAO(LW+18), LDA(T+6), FDV(T+2),  
STA(T+19), RAO(LW+19), LDA(T+6), FDV(T+3), STA(T+20), RAO(LW+20),  
SLJ(150).  
108 LDA(T+6), AJP3(150), FDV(T+4), STA(T+21), RAO(LW+21), SLJ(107).  
110 LDA(T+5), AJP3(114), FDV(T+2), STA(T+12), LDA(T+5), FDV(T+4),  
STA(T+14), RAO(LW+12), RAO(LW+14), LDA(T+6), AJP3(150), FDV(T+4),  
STA(T+21), RAO(LW+21).  
113 LDA(T+5), FDV(T+6), STA(T+15), RAO(LW+15), LDA(T+2), FDV(T+15),  
STA(T+10), RAO(LW+10), LDA(T+6), FDV(T+2), STA(T+19),  
RAO(LW+19), SLJ(150).  
114 LDA(T+6), AJP3(150), FDV(T+4), STA(T+21), LDA(T+6), FDV(T+2),  
STA(T+19), RAO(LW+21), RAO(LW+19), SLJ(150).
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ATHLETA PETROSA STOCK
PLATE IV

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116 LDA(T+3), AJP3(123), FDV(T+4), STA(T+9), RAO(LW+9), LDA(T+5),  
AJP3(121), FDV(T+3), STA(T+13), RAO(LW+13), LDA(T+5), FDV(T+4),  
STA(T+14), RAO(LW+14), LDA(T+6), AJP3(150), FDV(T+4), STA(T+21),  
RAO(LW+21).  
120 LDA(T+5), FDV(T+6), STA(T+15), RAO(LW+15), LDA(T+3), FDV(T+15),  
STA(T+11), RAO(LW+11), LDA(T+6), FDV(T+3), STA(T+20), RAO(LW+20),  
SLJ(150).  
121 LDA(T+6), AJP3(150), FDV(T+4), STA(T+21), LDA(T+6), FDV(T+3),  
STA(T+20), RAO(LW+21), RAO(LW+20), SLJ(150).  
123 LDA(T+5), AJP3(127), FDV(T+4), STA(T+16), RAO(LW+14), LDA(T+6),  
AJP3(150), FDV(T+4), STA(T+21), RAO(LW+21).  
126 LDA(T+5), FDV(T+6), STA(T+15), RAO(LW+15), SLJ(150).  
127 LDA(T+6), AJP3(150), FDV(T+4), STA(T+21), RAO(LW+21), SLJ(150).  
129 LDA(T+2), AJP3(138), LDA(T+3), AJP3(134), LDA(T+2), FDV(T+3),  
STA(T+7), RAO(LW+7), LDA(T+5), AJP3(133), FDV(T+2), STA(T+12),  
RAO(LW+12), LDA(T+5), FDV(T+3), STA(T+13), RAO(LW+13), LDA(T+5),  
FDV(T+7), STA(T+17), RAO(LW+17), LDA(T+6), AJP3(150), SLJ(106).  
133 LDA(T+6), AJP3(150), SLJ(107).  
134 LDA(T+5), AJP3(136), FDV(T+2), STA(T+12), RAO(LW+12), LDA(T+6),  
AJP3(150), SLJ(113).  
136 LDA(T+6), AJP3(150), FDV(T+2), STA(T+19), RAO(LW+19), SLJ(150).  
138 LDA(T+3), AJP3(143), LDA(T+5), AJP3(141), FDV(T+3), STA(T+13),  
RAO(LW+13), LDA(T+6), AJP3(150), SLJ(120).  
141 LDA(T+6), AJP3(150), FDV(T+3), STA(T+20), RAO(LW+20), SLJ(150).  
143 LDA(T+5), AJP3(150), LDA(T+6), AJP3(150), SLJ(126).  
150 CONTINUE
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Statements 100-150. Ratio calculations are bypassed unless all required
data are available. Pass symbols remain in cells of Block T unless
replaced by calculated ratios. Count calculated ratios in Block LW.

```
DO 155 I= 1, 14, 1  
A(I,J) = T(I)  
B(I,J) = T(1)  
DO 156 I= 2, 13, 1  
B(I+J) = T(I+13)  
  Transfer T1-T14 to Block A. Transfer T1 and T-15-T26 to  
  Block B.  
  
DO 158 I= 2, 26, 1  
IF (T(I)) 158, 157, 157  
W(I) = W(I) + 1.0  
U(I) = U(I) + T(I)  
V(I) = V(I) + (T(I)*T(I))  
  Test cells T2-T26. If pass symbol is present, skip. Accumulate data  
  entry in corresponding cell of Block U, square of entry in Block V.  
  Count data entries in Block W.  
  
158 CONTINUE  
159 CONTINUE  
0 PRINT 1, COA, COB, COC, DAA, DAB, DAC, IDB, K, ((A(I,J), I= 1,  
1 14, 1) J= 1, K, 1)  
0 PRINT 2, COA, COB, COC, DAA, DAB, DAC, IDB, K, ((B(I,J), I= 1,  
1 13, 1) J= 1, K, 1)  
  Print Blocks A and B.
```

STATISTICAL SUMMARY

```
161 DO 167 J= 2, 26, 1  
S(6) = W(J)  
IF (W(J)) 262, 262, 164  
164 S(4) = U(J)  
S(1) = U(J) / W(J)  
S(5) = V(J)  
IF (W(J) - 1.0) 264, 264, 165  
LDA(IPA), STA(S+1), STA(S+2), STA(S+3), STA(S+4), STA(S+5), SLJ(166).  
262 LDA(IPA), STA(S+2), STA(S+3), SLJ(166).  
264 S(3) = SORTF((V(J) - ((U(J) * U(J)) / W(J))) / (W(J) - 1.0))  
165 S(2) = IPA  
166 DO 266 I= 1, 6, 1  
266 C(I,J) = S(I)  
  If count = 0, enter pass symbol for other statistics. If count = 1 or more,  
  enter values of sum and sum of squares and calculate arithmetic mean.  
  Calculate standard deviation only if count is greater than 1.
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```
167 CONTINUE  
  Calculate summary for each measurement and each ratio.  
  
0 PRINT 3, COA, COB, COC, DAA, DAB, DAC, IDB, K, (Y(J), Z(J),  
1 (C(I,J), I= 1, 6, 1), LW(J), J= 2, 26, 1)  
  Print Block C.  
  
168 CONTINUE  
CALL TIME (1HP)  
END
```

DATA CARDS

Example 1.
AUGUST 28, 1961 51
Data card, Format 4. Cols. 3-21, date of computer run, beginning in 3.
Cols. 22-30, number of data blocks to be processed, ending in 30. One
card.

Example 2.

A	B	C	D	E
A/B	A/C	B/C	A/(D/F)	B/(D/F)
D/A	D/B	D/C	D/E	C/(A/B)
D/(A/B)	E/(A/B)	E/A	E/R	F/C
A+B+C	A/(A+B+C)	B/(A+B+C)	C/(A+B+C)	(A/C)/(A+B+C)

Data cards, Format 7. Line headings for Block C. Five cards.

Example 3.
HOUSTON COUNTY 113036 9
Data card, Format 5. Cols. 3-24, county name, beginning in 3. Cols.
28-30, 3-digit county identification number. Cols. 31-33, 3-digit
locality identification number. Cols. 34-40, number of specimens in
data block, ending in 40. One card for each block of specimen data.

Example 4.
036001 6.0 7.0 6.0 2.0 -99.0 113
Data cards, Format 14. Cols. 5-7, 3-digit locality identification number.
Cols. 8-10, 3-digit specimen identification number. Cols. 11-60, five
10-character data fields with decimal point as 9th character in each
field. Cols. 78-80, 3-digit county identification number. The entry
"-99.0" indicates that the measured value is not available. One card
for each specimen.

FORTRAN PROGRAM I FOR CALCULATING STATISTICAL
SUMMARY OF PRIMARY AND SECONDARY DATA