APPENDIX A

PROGRAM FOR STEP-WISE MULTIPLE REGRESSION IN FORTRAN-IV

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      PROGRAM  BUCH
          ** STEP-WISE MULTIPLE REGRESSION **
      DIMENSION    S(16,16),M(16),T(16),B(16),X(16)
      READ   1, K, N
      K1 = K - 1
      DO 797  I = 1, K
      T (I) = 0
      DO 797 J = 1, K
797   S (I,J) = 0
      N = 0
 23   READ 7, Y1, (X(I), I = 1, K1)
      IF(EOF, 60)22, 25
  7   FORMAT (2X, 16 F 2.0)
 25   X(K) = Y1
      N = N+1
      DO 77 J = 1, K
      T(I) = T(I) + X(I)
      DO 77 J = 1, K
      S(I, J) = S (I,J) + X(I) * X(J)
 77   S(J,I) = S(I,J)
      60 TO 23
 22   PRINT 32, N, K1
 32   FORMAT (25X, 2HN = ,I3//25X,2HP = ,I3//25X,5HMEANS)
      AN = N
      DO 24 I = 1, K
      DO 24 J = 1, K
      IF(I - 1) 24, 665, 24
665   T(J) = T(J)/AN
 24   S(I,J) = S(I,J) - AN * T(I) * T(J)
 31   PRINT 666, (T(I), I = 1,K)
      PRINT 568
568   FORMAT (//25X, 14 HCORR SP MATRIX)
      DO567  I = 1, K
567   PRINT 666, (S(I,J), J = 1, I)
      DO 5 I = 1, K
  5   M(I) = I
      D = S (K, K)
      I = 1
      I = 0
 62   I = I+1
      CC = 0.0
      DO 15 J = 1, K1
      S(J,K) = S(J,K) * S(J,K)/(S(J,J) * S(K, K))
      IF (CC - S(J,K)) 20,20,15
 20   CC = S(J,K)
      M1 = J
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15    CONTINUE
      R1 = T(I)
      T(I) = T(M1)
      T(M1) = R1
      DO 36 J = 1, K1
36    S(J,K) = S(K,J)
      DO 40 J = 1, K
      R1 = S(J,I)
      S(J,I) = S(J,M1)
40    S(J,M1) = R1
      DO 50 J = 1, K
      R1 = S(I,J)
      S (I,J) = S(M1, J)
50    S(M1,J) = R1
      CC = M(I)
      M(I) = M(M1)
      M(M1) = CC
      I1 = I + 1
      DO 55 J = I1, K
55    S(I,J) = S(I,J)/S(I,I)
      DO 60 L1 = I1, K
      DO 60 L2 = I1, K
60    S(L1,L2) = S(L1,L2) - S(L1,I) * S(I, L2)
      RP = R
      R = 1.0 - S(K,K)/D
      R = SQRTF(R)
      LL = N - I - 1
      IF (I-1) 75, 80, 75
75    CC = (R-RP) * FLOATF(LL)/(1.0 - R)
80    B(I) = S(I, K)
      DO 35 L1 = 2,I
      R1 = 0.0
      N1 = I + 2 - L1
      N2 = N1 - 1
      DO 10 J = N1, I
10    R1 = R1 + S(N2,J) * B(J)
35    B(N2) = S(N2,K) - R1
      R1 = 0.0
      DO 70 J = 1,I
70    R1 = R1 + T(J) * B(J)
      R1 = T(K) - R1
      IF (I-1) 91, 90, 91
90    CC = R * FLOATF (LL)/(1.0 - R)
      PRINT 99
99    FORMAT (1H1)
      PRINT  6
      PRINT 88
      PRINT  6
91    PRINT 94, M(I),R,LL,CC, R1,(B(J), J = 1, I)
      IF (I - K1) 62, 85, 85
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 85   PRINT  6
      PRINT  9, (M(I), I = 1, K1)
      PRINT  6
      PRINT  9, (M(I), I = 1, K1)
      PRINT  6
      PAUSE
 88   FORMAT (1X, 4HVAR., 1X, 8HMULTIPLE, 2X, 4HD.F.,
               1X, 7HF - VALUE, 3X, 5HALPHA, 115X,
               23HREGRESSION COEFFICIENTS/5X, 10HCOR.COEFF.)
  1   FORMAT (2I3)
  6   FORMAT (1X, 130(1H - ))
 94   FORMAT (12X, I2, 2X, F8.4, 2X, 2H1,,I3, 2F 9.2,
               10F 8.2/49X, 10F 8.2/49X, 110F 8.2/49X,
               10F 8.2)
  9   FORMAT (40X, 11 (I2,6X))
666   FORMAT (1H0, 9(1X, E12.5))
      STOP
      END
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