A SHORT METHOD FOR SOLVING FOR A COEFFICIENT OF MULTIPLE CORRELATION

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The method which we present presupposes a familiarity with the Doolittle method [1] for solving normal equations. We start with the determinant

$$(1) \qquad R = \begin{vmatrix} 1 & r_{12} & \cdots & r_{1n} \\ r_{12} & 1 & \cdots & r_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ r_{1n} & r_{2n} & \cdots & 1 \end{vmatrix}$$

where the elements are zero order coefficients of correlation.

Now the adjoint determinant of (1) may be written

$$(2) \qquad r = \begin{vmatrix} R_{11} & R_{12} & \cdots & R_{1n} \\ R_{12} & R_{22} & \cdots & R_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ R_{1n} & R_{2n} & \cdots & R_{nn} \end{vmatrix}$$

where the elements are the cofactors of the elements in (1).

From the elementary theory of determinants [2] we know that

$$(3) \qquad r = R^{n-1}$$

The adjoint determinant of r may be designated by KR where

$$(4) \qquad KR = r^{n-1}$$

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[1] Mills, F. C., Statistical Methods, p. 577.
[2] Bôcher, Maxime, Introduction to Higher Algebra, p. 33.