

The almost-principal minors and ap-rank of symmetric matrices

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An *almost-principal* minor of a given matrix is the determinant of a (square) submatrix whose row and column indices differ in exactly one index.

The *almost-principal rank characteristic sequence* (*apr-sequence*) of a symmetric matrix $B \in F^{n \times n}$ is $a_1 a_2 \cdots a_{n-1}$, where a_k is **A** (respectively, **N**) if all of (respectively, none of) the almost-principal minors of order k are nonzero; if some but not all are nonzero, then $a_k = \mathbf{S}$.

The *almost-principal rank* of a symmetric matrix B , denoted by $\text{ap-rank}(B)$, is the size of a largest nonsingular almost-principal submatrix of B .

Results regarding apr-sequences will be presented, and particular attention will be given to the relationship between the rank and ap-rank of a symmetric matrix.

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