

# On similarity invariants of square matrices

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## Abstract

In Matrix Theory there exists an important class of problems the so-called Matrix Completion Problems, whose main goal is to describe conditions under which we can fill the unknown entries, such that the resultant matrix satisfies certain properties. Throughout the last decades, several results have been published in this important area of Matrix Theory, see for example [1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11].

In this talk we describe the list of the possible eigenvalues or the characteristic polynomial of a matrix of the form

$$C = \begin{bmatrix} C_{1,1} & C_{1,2} & C_{1,3} \\ C_{2,1} & C_{2,2} & C_{2,3} \\ C_{3,1} & C_{3,2} & C_{3,3} \end{bmatrix} \in F^{n \times n},$$

(where the blocks  $C_{i,j} \in F^{p_i \times p_j}$ ,  $i, j \in \{1, 2, 3\}$ ,  $n = p_1 + p_2 + p_3$ ) when some of its blocks are prescribed and the others vary.

## Keywords

Matrix completion problems, Eigenvalues, Characteristic polynomial.

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