STUDYING GRAPHS THROUGH PAWLAK'S TECHNIQUES

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In the present talk, we consider any matrix associated with a graph as a Pawlak's datatable, so that we can apply Pawlak's techniques to get structural properties of graphs. Thus, we first outline a mathematical abstraction of the aforementioned techniques: to this end, we focus our attention to the *indiscernibility relation* and *reducts*, exhibiting the main properties of these notions in our generalized setting. In the context of graphs, we interpret the indiscernibility relation to a local vertex symmetry in the sense of Erdos-Renyi, through which to induce a lattice of partitions on the vertex set and a corresponding closure operator describing how the level of information achievable by local symmetry varies.

In addition, we observe that working with the distance matrix of a graph, reducts are exactly the *resolvent subset of vertices*, while, when working with its adjacence matrix, we are able to characterize reducts for various tipologies of graphs. Nevertheless, "localizing" reducts, we associate with any graph an abstract simplicial complex that behaves as the independent family of a matroid, without being in general a matroid. From these results, we introduce two classes of datatables satisfying some matroidal-like properties and of which we exhibit some models from graph theory.

References

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