WEAK EQUIVALENCES, WEAK CONGRUENCES AND APPLICATIONS

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Weak reflexivity plays the main role in both notions that are the topic of this presentation: weak equivalences and weak congruences. Symmetry, transitivity (and compatibility) are also satisfied in all investigated structures. The lecture will be divided into two parts. The first one is connected with weak congruences, pointing to an old open problem: representation of algebraic lattices by weak congruences, which has application in structural investigations of algebras. Some new results on this topic will be presented.

Second line of this presentation deals with fuzzy relations, which are mappings from a direct product of sets to an ordered structure. Every fuzzy relation in this context is connected with a family of ordinary relations with analogue properties, and the family makes an ordered structure by itself.

Equivalences and fuzzy equivalences are closely related to some problems in taxonomy (classification of species). Further, weak reflexivity plays and important role in some problems in artificial intelligence (fuzzy control systems). These applications will be elaborated.

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