Closure operators and choice operators : a survey

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Abstract

In this talk I will give a overview on the connections between closure operators and choice operators and on related results. An operator on a finite set S is a map defined on the set P(S) of all the subsets of S. A closure operator is an extensive, isotone and idempotent operator. A choice operator c is a contracting operator ($c(A) \subseteq A$, for every $A \subseteq S$). Choice operators and their lattices have been very studied in the framework of the theory of the revealed preference in economics. A significant connection between closure operators and choice operators is the duality between anti-exchange operators (corresponding to convex geometries) and path-independent choice operators. More generally, there is a one-to-one correspondence between closure operators and choice operators.

Some references

Aleskerov F., Bouyssou D., Monjardet B., (2007.) Utility maximisation, choice and preference, (Studies in Economic Theory 16), Springer-Verlag.

Caspard N., Monjardet B., (2004). Some lattices of closure systems Discrete Mathematics and Theoretical Computer Science, 6, 163-190. Danilov V., Koshevoy G. A., (2006). Choice functions and extending operators, preprint.

J. Demetrovics, G. Hencsey, L. Libkin, I.B. Muchnik, (1992) On the interaction between closure operations and choice functions with applications to relational databases, Acta Cybernetica 10 (3), 129 – 139.

Echenique (2007), Counting combinatorial choice rules, Games and Economic Behavior 58 (2007), 231-245.

Johnson, M. R., Dean, R.A (1996): "An Algebraic Characterization of Path Independent Choice Functions," Third International Meeting of the Society for Social Choice and Welfare, Maastricht, TheNetherlands.

Koshevoy G. A., (1999) Choice functions and abstract convex geometries. Mathematical Social Sciences, 38(1), 35-44.

Monjardet B., Raderinirina V. (2001) The duality between the anti-exchange closure operators and the path independent choice operators on a finite set. Mathematical Social Sciences, 41(2), 131-150.