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Latin squares and partial groupoids [Abstract of thesis]

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to find such an optimum therapy. The simulated annealing algorithm was implemented to solve this task and to enable the system to be used in an interactive way. This part of the system also offers therapy proposals when current therapy scheme is changed. The dialogue is based on an user–friendly communication subsystem, whose description is included. The system is implemented in Turbo Pascal language on personal computer. The learning abilities off the system were tested. The system is able to predict blood sugar value with precision of 2.5 mmol/l after 3 days and 6 days of insulin pump therapy and conventional injection therapy respectively. Nowadays, the system is tested to evaluate its performation in a more detailed way from the medical point of view.

LATIN SQUARES AND PARTIAL GROUPOIDS

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(27.9.1989, supervisor K.Drbohlav)

The thesis is devoted to the study of the (so called) couples of companions. A couple of companion K is such a partial algebra $K = K(\circ, *)$ that $K(\circ)$ and $K(*)$ are cancellative groupoids, $a \circ b$ is defined iff $a * b$ is defined and for any $a, b \in K$ there exist $c, d, e, f \in K$, $c \neq b \neq d$, $e \neq a \neq f$ with $a * b = a \circ c = e \circ b$ and $a \circ b = a * d = f * d$. Couples of companions may be obtained in a natural way from pairs of qausigroups with the same underlying set and they are studied in connection with some open questions of the quasigroup theory (see [1]).

A general structural theory of couples of companions is developed using several types of amalgamation–like constructions. The geometrical notion of planarity is shown to be of central meaning here and some equations quantifying "non–planarity" of a couple are presented.

The constructions may be used to produce an algorithm generating all couples of companions of a given order.

References

[1] A. Drápal, T. Kepka, *Group modifications of some partial groupoids*, Annals Discr. Math. 18 (1983), 319–322.

ASSOCIATIVE RINGS AND THE WHITEHEAD PROPERTY OF MODULES

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In chapter 1, the notion of an orthogonal theory is studied. This notion generalizes the well–known notions of a torsion theory and a cotorsion theory, respectively (Dickson, Salce). It is proved that there is a canonical embedding of the upper semilattice of all orthogonal theories of the Tor^R bifunctor into the lower semilattice of all orthogonal theories of the Ext^R bifunctor.

The author introduces the notion of a $\otimes$–ring ($\otimes$ is the tensor product bifunctor). He proves that if R is a (von Neumann) regular ring of cardinality $\leq \aleph_0$ or a certain