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Quantization of Lie and Jordan triple systems

This talk will show how the decomposition of the group ring of the symmetric group into a direct sum of full matrix subrings can be used to give a complete classification of n -ary operations. Roughly speaking, row equivalence of matrices corresponds to quasi-equivalence of operations. In particular, the Lie and Jordan products represent the two non-trivial quasi-equivalence classes of binary operations. For ternary operations, there are infinitely many quasi-equivalence classes, which divide into eight classes, and four infinite families of classes each with a single parameter. The Lie triple product is contained in one of the infinite classes, and the other operations in the class can be regarded as quantizations of that product. Similar remarks apply to the Jordan triple product. For special values of the parameter, the operation satisfies an identity of degree 5. This identifies some new ternary operations which define varieties of triple systems, similar to Lie and Jordan triple systems, which seem to be an interesting direction for further research.