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Multiplicative graphs and related algebras

A multiplicative graph Q is a graph together with an associative morphism of its cartesian square $Q \square Q$ to Q . There are several examples of multiplicative graphs that arise in knot theory; the category of multiplicative graphs whose vertices form a group is equivalent to the category of augmented racks. We show how to construct rack homology via multiplicative graphs and define several Hopf algebras associated with a multiplicative graph.