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Rack and one term homology are very useful tools for studying self-distributive algebraic structures arising out of knot theory. However, it turns out that when these self-distributive algebraic structures are associative, rack and one term homology groups are not very interesting. Motivated by this, we introduce a new homology theory for these algebraic structures. Further, we study properties of this homology theory and discuss potential applications. (Received September 11, 2016)