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2. Algebra

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Set product residue semigroups.

An equivalence relation ρ_H on a semigroup S is defined by $a\rho_H b \Longleftrightarrow aH = bH (a, b \in S)$ where $H \subset S$. If, for any pair $a, b \in S$, there exists $c \in S$ such that $(aH)(bH) = cH$ (called *set product condition*), then we can define an associative multiplication $\bar{a} * \bar{b} = \bar{c}$ in S/ρ_H. We call $(S/\rho_H, *)$ the *set product residue semigroup* of S with respect to H. In general, $\bar{a} * \bar{b} \neq \overline{ab}$. A homomorphism theorem and examples including a semigroup in which, every subset satisfies the set product condition, will be presented. A lattice theoretic aspect of the idempotent semigroup is related to this notion.