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Arithmetic Operations in Deterministic P Systems Based on the Weak Rule Priority

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Abstract : Membrane computing is a computability model which abstracts its structures and functions from the biological cell. The main ingredient of membrane computing is the notion of a membrane structure, which consists of several cell-like membranes recurrently placed inside a unique skin membrane. The emergence of several variants of membrane computing gives rise to the notion of a P system. The paper presents a variant of P systems for arithmetic operations on non-negative integers based on the weak priorities for rule application. Consequently, we obtain deterministic P systems. Two membranes suffice. There are at most four objects for multiplication and five objects for division throughout the computation processes. The model is simple and has a potential for possible extension to non-negative integers and real numbers in general.

Keywords : P system, binary operation, determinism, weak rule priority
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