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Piecewise-Defined Difference Equations: Open Problem.

We consider difference equations of the form

$$x_{n+1} = f_n(x_n, x_{n-1}, \ldots, x_{n-k}),$$

where $k \in \{0, 1, \ldots\}$, $f_n : D^{k+1} \to \mathbf{R}$ is piecewise-defined and for the most part continuous, whose bhavior of solutions is such that every solution is eventually periodic. There exist numerous such examples of piecewise-defined equations whose every solution is eventually periodic. We present four categories containing these examples, but also containing examples of exceptions. We then present some speculative properties that our examples of piece-defined equations, whose every solution is eventually periodic, seem to have in common, as well as some speculative properties that the examples of exceptions have. Hence the words, "Open Problem," in our title. (Received January 19, 2015)