1106-39-529   **Candace M. Kent*** (`cmkent@vcu.edu`), Virginia Commonwealth University, Dept. of Mathematics and Applied Mathematics, 1015 Floyd Avenue, Richmond, VA 23284-2014. *Piecewise-Defined Difference Equations: Open Problem.*

We consider difference equations of the form

$$x_{n+1} = f_n(x_n, x_{n-1}, \ldots, x_{n-k}), n = 0, 1, \ldots,$$

where $k \in \{0, 1, \ldots\}$, f_n is piecewise defined and $f_n : D^{k+1} \to D$, $D \subset \mathbf{R}$, whose behavior of solutions is limited to that of being either eventually periodic or unbounded. There exist numerous examples of difference equations that are both piecewise defined and characterized by having either every solution eventually periodic or every solution unbounded. We briefly describe four such cases. However, not all piecewise-defined difference equations have solutions with this behavior, and we point out some exceptions. We then present some properties that our sampling of eventually periodic or unbounded piecewise-defined difference equations have in common. We follow up with an open problem requesting an explanation as to why certain piecewise-defined difference equations have eventually periodic or unbounded solutions, and others do not. (Received September 01, 2014)