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Stevo Stević

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Let $\varphi(x_1, x_2, \dots, x_k)$ be a continuous real function on \mathcal{R}^k which is nondecreasing in each variable and increasing in the first one and $\varphi(x, x, \dots, x) \leq x$, for every $x \in \mathcal{R}$. If (a_n) is a bounded sequence which satisfies the inequality

$$a_{n+k} \leq \varphi(a_{n+k-1}, a_{n+k-2}, \dots, a_n), \text{ for } n \in N \cup \{0\}.$$

then it must be convergent.

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