



Generalized Nonaveraging Integer Sequences

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Let the sequence S_m of nonnegative integers be generated by the following conditions: Set the first term $a_0 = 0$, and for all $k \geq 0$, let a_{k+1} be the least integer greater than a_k such that no element of $\{a_0, \dots, a_{k+1}\}$ is the average of $m - 1$ distinct other elements. Szekeres gave a closed-form description of S_3 in 1936, and Layman provided a similar description for S_4 in 1999. We first find closed forms for some similar greedy sequences that avoid averages in terms not all the same. Then, we extend the closed-form description of S_m from the known cases when $m = 3$ and $m = 4$ to any integer $m \geq 3$. With the help of a computer, we also generalize this to sequences that avoid solutions to specific weighted averages in distinct terms. Finally, from the closed forms of these sequences, we find bounds for their growth rates.

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