Challenge - No More Initialization

Devise a way to avoid initializing large arrays. More specifically, develop a data structure that holds $n$ items according to an index $i \in \{1, \ldots, n\}$ and supports the following operations in $O(1)$ time (worst case) per operation:

- [init] Initializes the data structure to empty.
- [set($i$, $x$)] places item $x$ at index $i$ in the data structure.
- [get($i$)] returns the item stored in index $i$, or “empty” if nothing is there.

Your data structure should use $O(n)$ space and should work regardless of what garbage values are stored in that space at the beginning of the execution.