button's count either $n + 2$, $n - 2$, or $n$, depending on whether the buttons common to both neighborhoods were, respectively, originally both off, both on, or one on and one off. Thus the original button's parity will not be changed by pushing a non-disjoint button. This leads to the following result.

**Theorem 1.** The parity of a button is changed if and only if that button is pushed.

Combining Theorem 1 and the fact that every game is winnable, we get an easily implemented method to solve the *Mini Lights Out* game. Clearly, at the end of the game each button must have parity 0. By Theorem 1, this parity can only be changed by pushing that button. Thus we merely push those buttons whose parity is one.

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**References**


Proof Without Words: Logarithm of a Number and Its Reciprocal

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