Solving Minesweeper

Aresh Pourkavoos

June 20, 2022

The "Minesweeper problem" consists of a set S, a family of sets $\mathcal{F} \subseteq \mathcal{P}(S)$, and a function $g : \mathcal{F} \to \mathbb{N}$. S is the set of cells on the board, and $\mathcal{F}$ contains the set of neighbors of each square. For all $A \in \mathcal{F}$, $g(A) = n$ is the number of elements of A (which are squares) that contain mines, so $0 \leq n \leq |A|$.

Perform all possible intersections of elements of $\mathcal{F}$

Assign variable to each intersection representing number of mines

Sums of these variables corresponding to a single $A \in \mathcal{F}$ are known

Variables themselves are only given ranges

Need to find a variable with value 0 (if one exists) so its cells can be revealed