
Artificial Intelligence : Lab Exercise 1

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1 $(n^2 - 1)$ -puzzle

Implement the $(n^2 - 1)$ -puzzle environment. Also, implement parity function using the following definition:

- A position p_i is said to occur after p_j , if p_i occurs to the right of p_j in the same row or if p_i occurs at any row below p_j . This defines the ordering.
- For a state s , let $d(s)$ denote the number of rows + number of columns that the empty square is away from the bottom right corner.
- Let $I_{\text{True}} = 1$ and $I_{\text{False}} = 0$ (this is known as *indicator* function).
- For a state s , parity is given by $\text{mod}(d(s) + \sum_{p_i, p_j > p_i} I_{p_j(s) < p_i(s)}, 2)$, where $p_i(s)$ is the number at the i^{th} position.
- $\text{mod}(n, 2)$ is equal to the remainder on dividing n by 2.
- Imagine the empty square to be n^2 .

2 Robot Navigation

Create the following navigation environment with blockades. Take $G = 100$ (grid-size), the blocked places can be 0's and the other ones can be represented by 1. The figure is only illustrative, and in a grid blocking would mean blocking the entire cell.

