Artificial Intelligence : Lab Exercise 1

chandru@iitpkd.ac.in

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 $mod(d(s) + \sum_{p_i, p_j > p_j} I_{p_j(s) < p_i(s)}, 2)$, where $p_i(s)$ is the number at the i^{th} position.
- $mod(n, 2)$ 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.