CAB320 – Assignment 1

Sokoban Assignment

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Sokoban is a puzzle game in which a player a warehouse worker, moving one or more crates from a starting position to a goal position. Created in 1981 by Hiroyuki Imabayashi, the game is played on a board of squares, where each square is a floor or a wall. In order for the player to relocate the crates to the goal, the player move the warehouse worker around the game board pushing crates, providing there is floor space adjacent to the crate in the direction the warehouse worker is pushing.

# Notations

The notations used to represent the ware house in this report:

|  |  |
| --- | --- |
| @ | The player |
| # | A wall square |
| Space | A floor square |
| $ | A crate |
| . | The goal square |
| ! | The player on a goal square |
| \* | A box on a goal square |
| X | A taboo floor square |

# Functions

## taboo\_cells

This function identifies taboo squares within the warehouse, returning a string that represents the warehouse, but only containing walls and taboo squares. A square is identified as taboo when it’s identified as a square that players could push the crate on to, but then would not be able to make any addition moves due to the game play constraints.

## check\_action\_seq

The function check\_action\_seq is utilised to determine if a sequence of actions is possible. The function takes 2 parameters, a warehouse and a list of actions. The list must be constructed and passed in the following form: [‘Right’, ‘Down’, Left’, ‘Up’,…].

For an action to be legal it must adhere to the specified criteria:

* The action must not push more than one crate at a time
* The action must not result in a crate being pushed into a wall
* The action must not move the walker into a wall

If an action is deemed legal, the function executes each action in the list and returns the resulting warehouse, otherwise it will return the string ‘Failure’.

## solve\_sokoban\_elem

## can\_go\_there

## solve\_sokoban\_macro