Map

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Contents

Service: Map

Types: bool, int, Cell

Observators:
const Height: $[Map] \to int$
const Width: $[Map] \to int$
CellNature: $[Map] \times int \times int \to Cell$ **pre** CellNature(M, x, y) **requires** $0 \leq x < Width(M)$ and $0 \leq y < Height(M)$

Constructors:

init: $int \times int \to [Map]$ **pre** init(w,h) requires $0 <$ w and $0 <$ h

Operators:

OpenDoor: $[Map] \times int \times int \to [Map]$ **pre** OpenDoor(M, x, y) **requires** CellNature$(M, x, y) \in DNC, DWC$
CloseDoor: $[Map] \times int \times int \to [Map]$
pre $CloseDoor(M, x, y)$ **requires** CellNature$(M, x, y) \in \{DNO, DWO\}$

Observation:

[**Invariant**]: $\top$
[**Init**]:

Height(init(h,w)) = h
Width(init(h,w)) = w
[**OpenDoor**]:
CellNature(M,x,y) = DWC **implies** CellNature(OpenDoor(M,x,y),x,y) = DWO
CellNature(M,x,y) = DNC **implies** CellNature(OpenDoor(M,x,y),x,y) = DNO
forall u ∈ [0; Width(M)-1] **forall** v ∈ [0; Height(M)-1] (u ≠ x **or** v ≠ y) **implies** CellNature(OpenDoor(M,x,y),u,v) = CellNature(M,u,v)
[**CloseDoor**]:
CellNature(M,x,y) = DWO **implies** CellNature(OpenDoor(M,x,y),x,y) = DWC
CellNature(M,x,y) = DNO **implies** CellNature(OpenDoor(M,x,y),x,y) = DNC
forall u ∈ [0; Width(M)-1] **forall** v ∈ [0; Height(M)-1] (u ≠ x **or** v ≠ y) **implies** CellNature(OpenDoor(M,x,y),u,v) = CellNature(M,u,v)