Maze Generation & Rendering

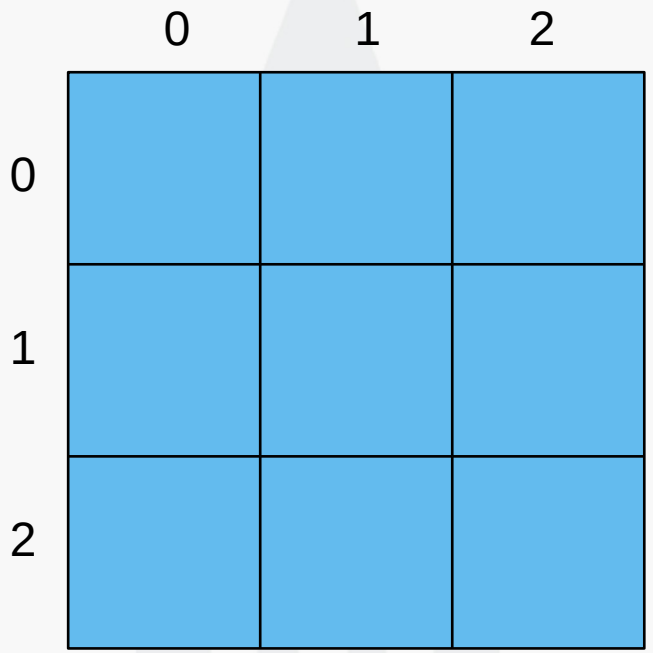
Prim’s Algorithm

Prim's Algorithm

1. Create a graph of cells
2. Randomly pick a cell, add it to the maze
   - Add its neighboring cells to the frontier
3. Randomly choose a cell in the frontier and (randomly) pick a wall that connects to a cell in the maze (alternatively, randomly pick a wall that connects a cell in the maze to a cell in the frontier)
   - Remove that wall
   - Add the cell to the maze
   - Update the frontier
4. Repeat Step 3 until no more cells in the frontier

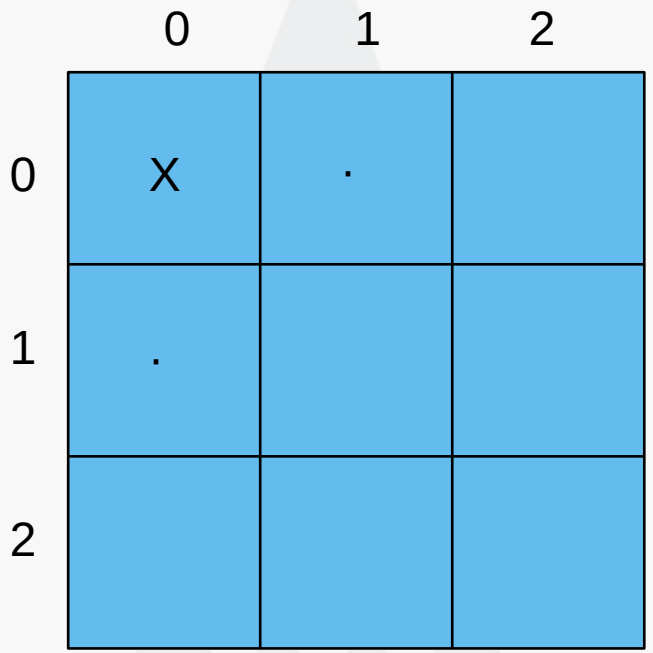
Frontier: list of cells adjacent to the cells already in the maze, but not in the maze.

Prim’s – Step 0



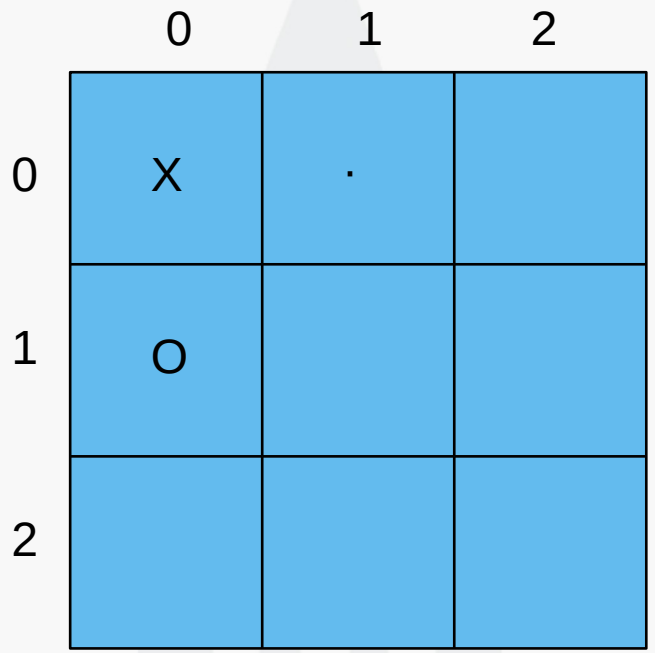
Frontier:

Prim’s – Step 1



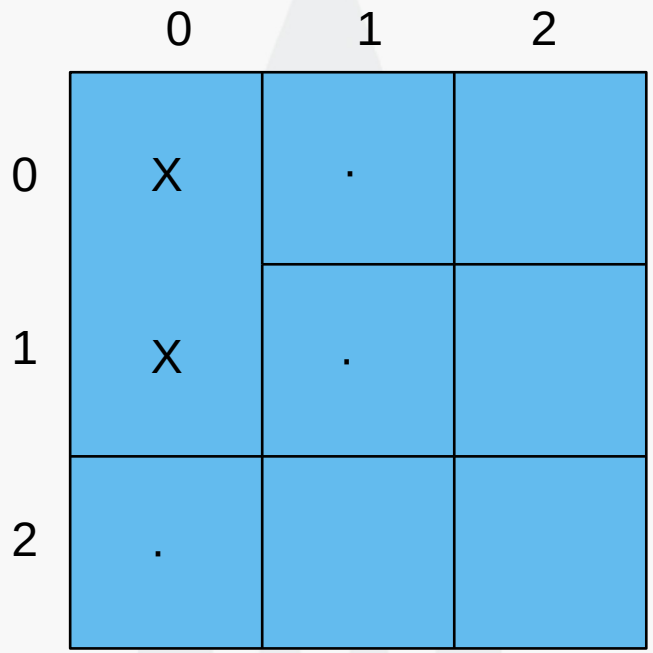
Frontier: (0, 1), (1, 0)

Prim’s – Step 2



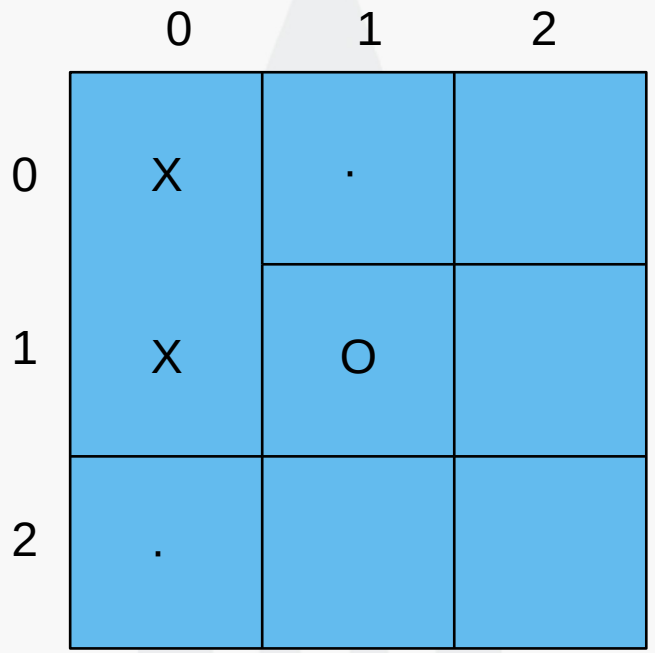
Frontier: (0, 1), **(1, 0)**

Prim’s – Step 3



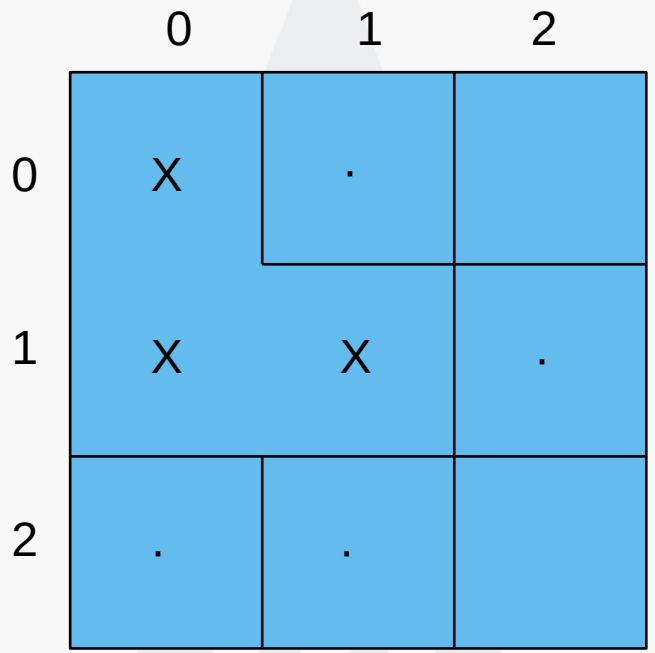
Frontier: (0, 1), (1, 1), (2, 0)

Prim’s – Step 4



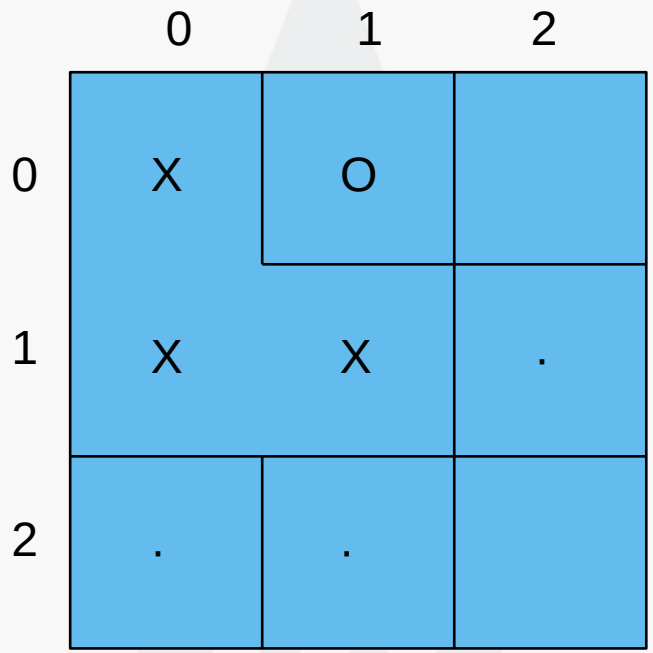
Frontier: (0, 1), **(1, 1)**, (2, 0)

Prim’s – Step 5



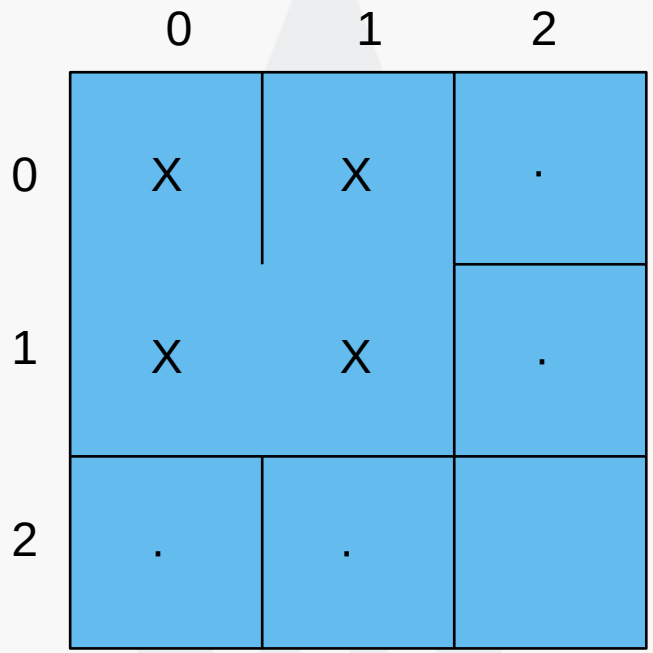
Frontier: (0, 1), (1, 2), (2, 0), (2, 1)

Prim’s – Step 6



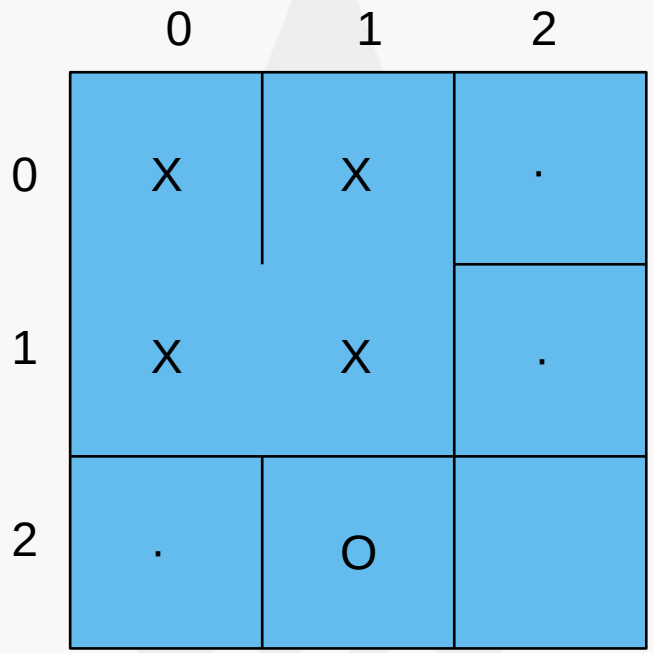
Frontier: **(0, 1)**, (1, 2), (2, 0), (2, 1)

Prim’s – Step 7



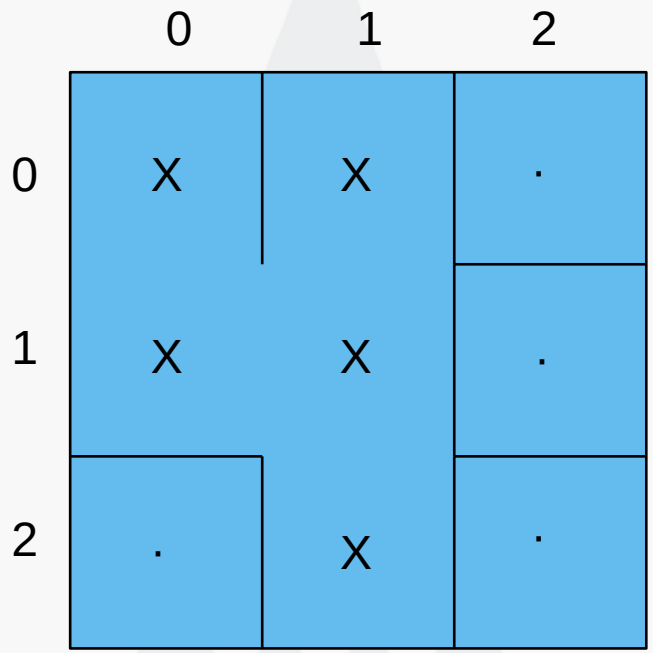
Frontier: (0, 2), (1, 2), (2, 0), (2, 1)

Prim’s – Step 8



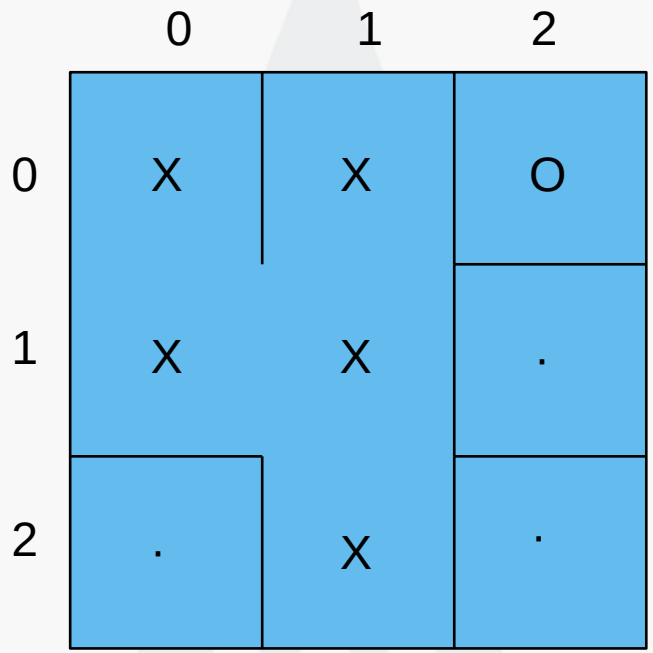
Frontier: (0, 2), (1, 2), (2, 0), **(2, 1)**

Prim’s – Step 9



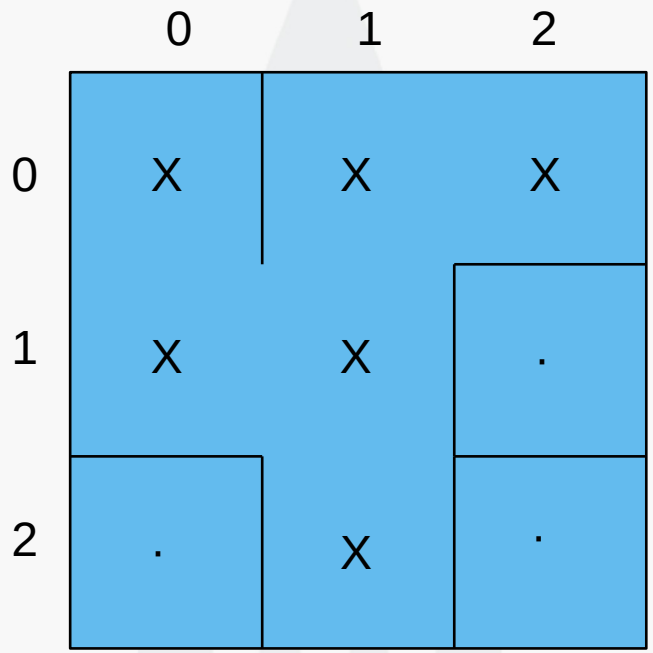
Frontier: (0, 2), (1, 2), (2, 0), (2, 2)

Prim’s – Step 10



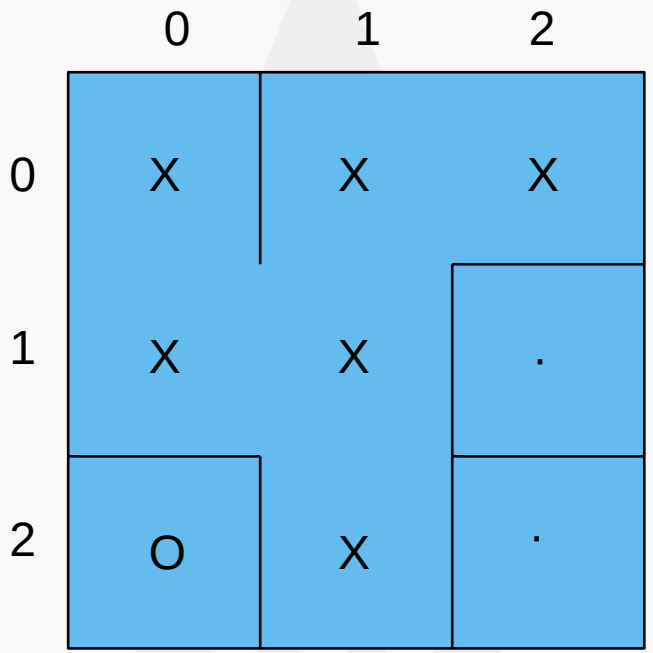
Frontier: **(0, 2)**, (1, 2), (2, 0), (2, 2)

Prim’s – Step 11



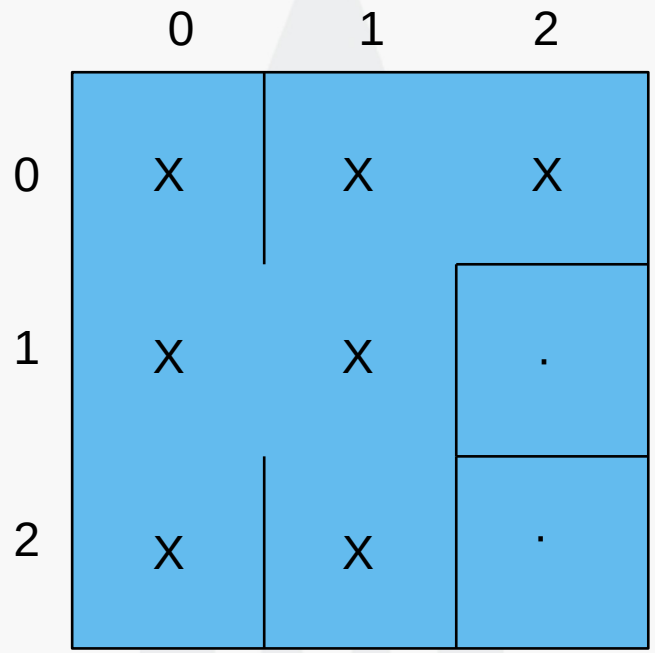
Frontier: (1, 2), (2, 0), (2, 2)

Prim’s – Step 12



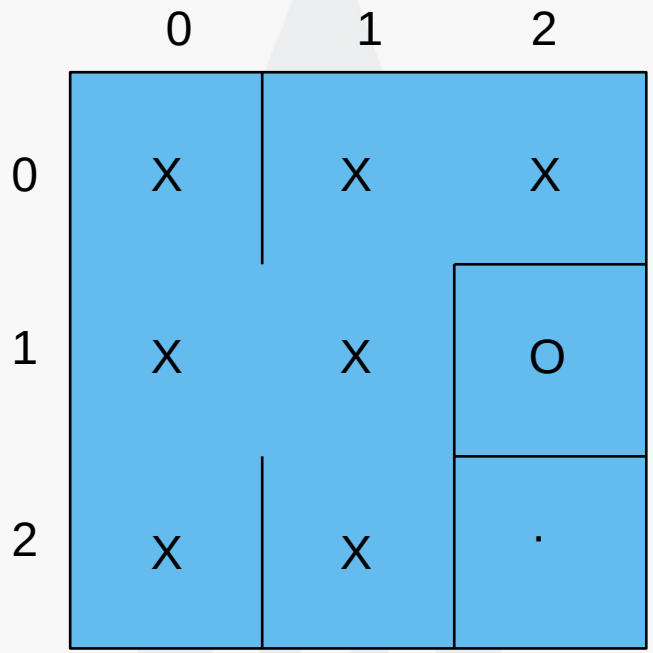
Frontier: (1, 2), **(2, 0)**, (2, 2)

Prim’s – Step 13



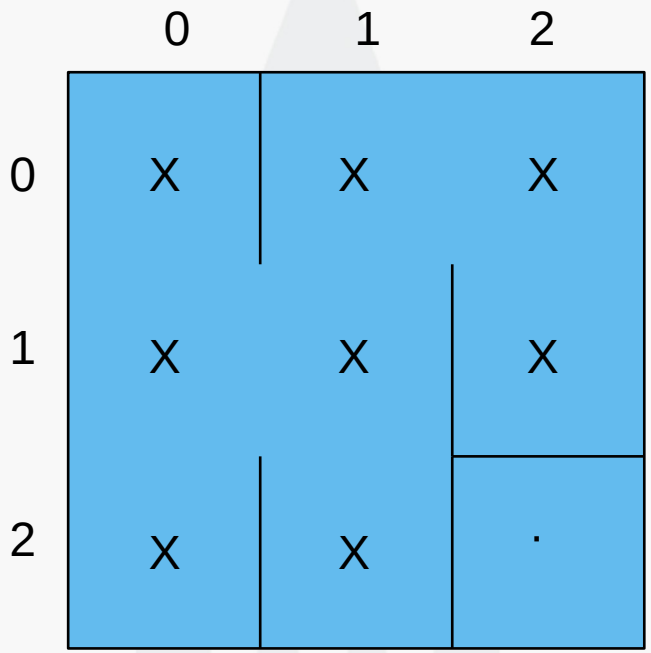
Frontier: (1, 2), (2, 2)

Prim’s – Step 14



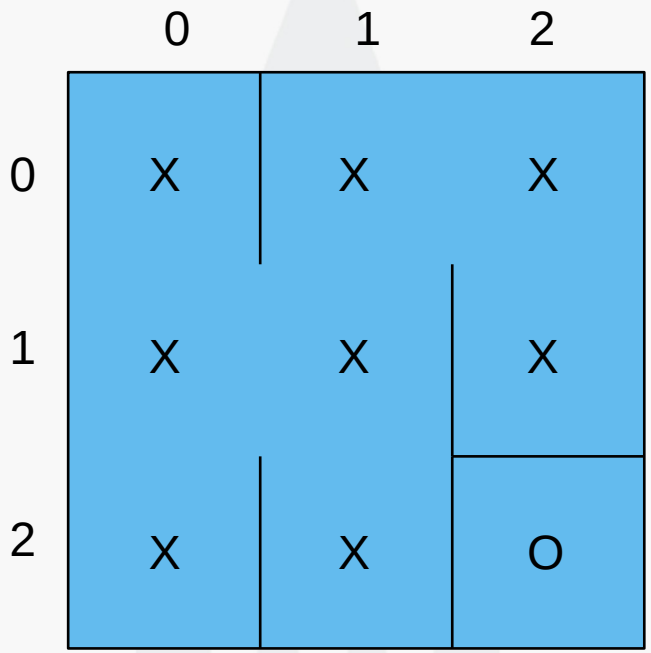
Frontier: **(1, 2)**, (2, 2)

Prim’s – Step 15



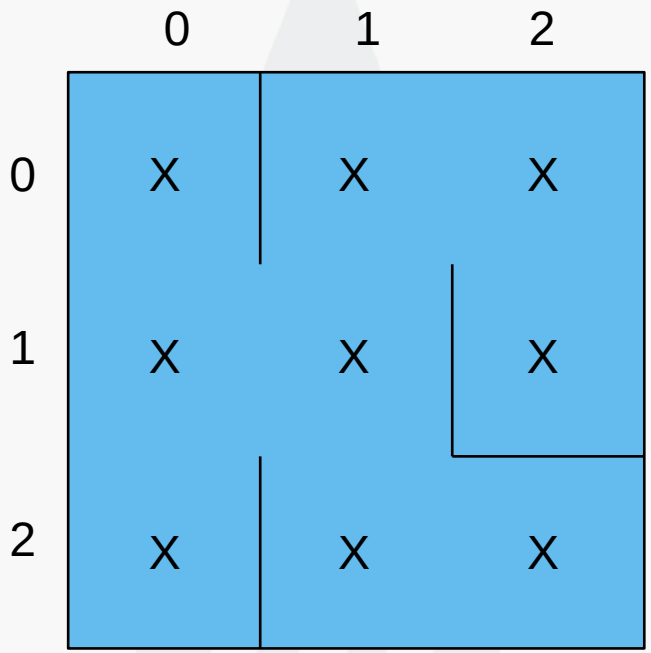
Frontier: (2, 2)

Prim’s – Step 16



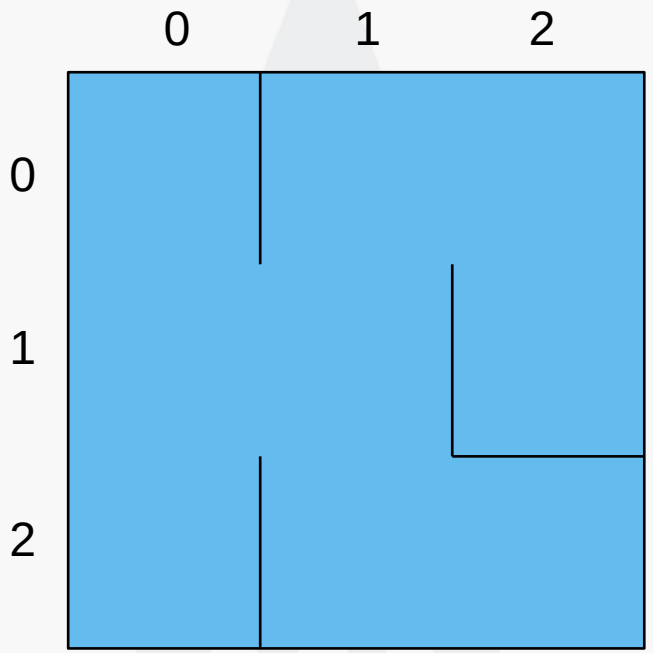
Frontier: **(2, 2)**

Prim’s – Step 17



Frontier:

Prim’s – Final



Frontier: