AARP Border Patrol Puzzle

The May **2020 AARP** magazine featured a simple sudoku type puzzle where an eight element grid is to be filled in with the digits 1,2,…,8. Digits are to be used only once and need satisfy certain border conditions described in the following **MiniZinc** https:// www.minizinc.org/ constraint program. The puzzle's solution is included as a comment within the minzinc program.

```
%          May AARP Border Patrol Puzzle
%
% Place the digits 1,2,...,7,8 into the grid below
% so that no two consecutive numbers share a border
% horizontally, vertically or diagonally.
%
%               #.
%              ###
%              ###
%               #
%
% The four solutions are displayed below.
% The solution is unique up to vertical/horizontal
% reflection.
%
%     2      2       7       7
%    586    685     314     413
%    314    413     586     685
%     7      7       2       2
```

```
%
include "alldifferent.mzn";
% Define an eight element array
array[1..8] of var 1..8: x;

%Horizontal border conditions
constraint abs(x[1]-x[3])!= 1;
constraint abs(x[3]-x[6])!= 1;
constraint abs(x[6]-x[8])!= 1;
constraint abs(x[2]-x[5])!= 1;
constraint abs(x[4]-x[7])!= 1;

%Vertical border conditions
constraint abs(x[2]-x[3])!= 1;
constraint abs(x[5]-x[6])!= 1;
constraint abs(x[3]-x[4])!= 1;
constraint abs(x[6]-x[7])!= 1;

%Diagonal border conditions
constraint abs(x[1]-x[2])!= 1;
constraint abs(x[3]-x[5])!= 1;
constraint abs(x[1]-x[4])!= 1;
constraint abs(x[3]-x[7])!= 1;
constraint abs(x[5]-x[8])!= 1;
constraint abs(x[7]-x[8])!= 1;
```

```
constraint abs(x[2]-x[6])!= 1;

constraint abs(x[4]-x[6])!= 1;


constraint alldifferent(x);

solve satisfy;

% ----------

% Finished in 82msec

% Compiling AARP Border Patrol.mzn

% Running AARP Border Patrol.mzn

% x = array1d(1..8 ,[2, 5, 8, 6, 3, 1, 4, 7]);

% ----------

% x = array1d(1..8 ,[2, 6, 8, 5, 4, 1, 3, 7]);

% ----------

% x = array1d(1..8 ,[7, 3, 1, 4, 5, 8, 6, 2]);

% ----------

% x = array1d(1..8 ,[7, 4, 1, 3, 6, 8, 5, 2]);

% ----------

% ==========

% Finished in 99msec
```