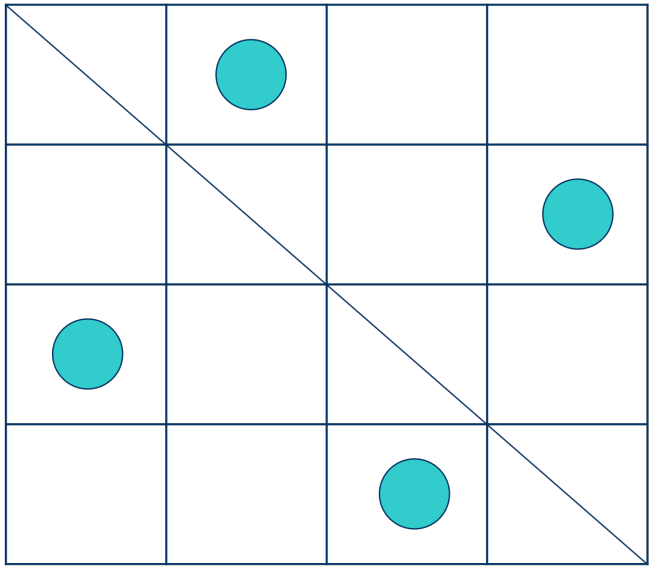
Modelling and Solving Exercises in MiniZinc - 3

N-Queens

- Using the alldifferent model (without symmetry breaking), search for **a solution** for N = 30, 35, 45, 50, using the following 6 variable - value ordering heuristics of Gecode:
  - input order – min value, input order – random value
  - smallest domain – min value, smallest domain – random value
  - domWdeg – min value, domWdeg – random value
- Compare the number of failures.
  - Why do some heuristics give the same results?

Optimal N-Queens

- Add an objective to the alldiff model:
  - Minimize the total distance of the queens to the main diagonal



Optimal N-Queens

- Search for the optimal solution to the 50-queens problem using Gecode, with a time limit of 5 mins (300 secs).
- Experiment with the following search strategies:
  - the default search;
  - the domWdeg-random value heuristic;
  - by adding restarting (Luby strategy with L = 250) to the previous;
  - by adding LNS (fixing the 85% of the variables) to the previous.
- Compare the number of failures and the objective value.

LNS in MiniZinc

- Available only with Gecode.

```
include "gecode.mzn";
```

  - Ref. Manual Sec. 4.2.4. Additional declarations for Gecode
- Kicks in with restarting.