Attention

- Use a separate folder for each problem.
- Create a project (.mzp) for each problem, if there is any data file involved.
  - Add the model files (*.mzn) and the data files (*.dzn).
- Configure the solver to obtain the solution statistics, to search for one or all solutions, and to set a time limit when needed.
- Use commas when reporting big numbers. E.g.,
  - 976474 instead of 976,474
- Submit one single zip file.

N-Queens

- Consider the n-Queens alldifferent model.
- Post the alldifferent constraints either by using global constraints or by decomposing them.
- Search for **one solution** for N = 28, 29 and 30 using the **input order of the variables and the values** with Gecode.

```
solve :: int_search(q, input_order, indomain_min)  satisfy;
```

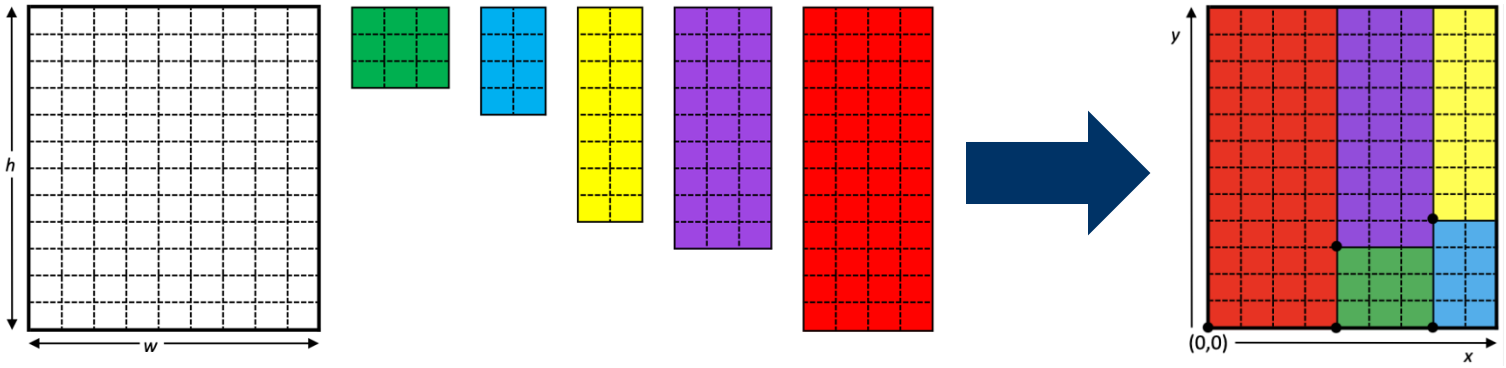
N-Queens

- Report the number of the failures and the total time of the two models in a table.

n	Alldifferent GC		Decomposition	
	Fails	Time	Fails	Time
28				
29				
30				

Poster Placement

- Given a set of posters in rectangle shapes and their size, and a bounded paper roll size, find a placement of the posters on the paper so that they can be printed without changing their orientation.



Poster Placement

- Model the problem.
  - What are the variables and the domains?
  - What are the constraints?
- Start with naïve constraint expressions and then look for an appropriate global constraint.
- Search for **one solution** to the two provided instances using **the default search** of Gecode.

Poster Placement

- Report the number of the failures and the total time in a table.

Instance	Naïve Model		Global Model	
	Fails	Time	Fails	Time
19x19				
20x20				

Comments

- Comment briefly on how the solver performance changes from one (decomposed or non-global) model to the global model, along with a justification.

The Sequence Puzzle

- Consider the model of the sequence puzzle.
  - Variables and Domains
    - $X_0, \ldots, X_{n-1} \in \{0, \ldots, n-1\}$
  - Constraints
    - for all i, $X_i = \sum_j (X_j = i)$
  - Implied constraints
    - $\sum_i X_i = n$
    - $\sum_i X_i * i = n$
- Globalize the main problem constraints.

The Sequence Puzzle

- Search for **one solution** for N = 500 and N=1000, using **the default search** of Gecode.
- Show the number of the failures and the total time of all the models in a table.

n	Base		Base + Implied		Global		Global + Implied	
	Fails	Time	Fails	Time	Fails	Time	Fails	Time
500								
1000								

Comments

- Answer briefly the following questions on the solver performance.
  - Going from Base → Global, and going from Base + Implied → Global + Implied: what is the main advantage of using a global constraint? Why?
  - Is there an implied constraint that now becomes redundant in the Global + Implied model? Why?