EPFL
ENAC INTER TRANSP-OR
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Decision-aid Methodologies in Transportation
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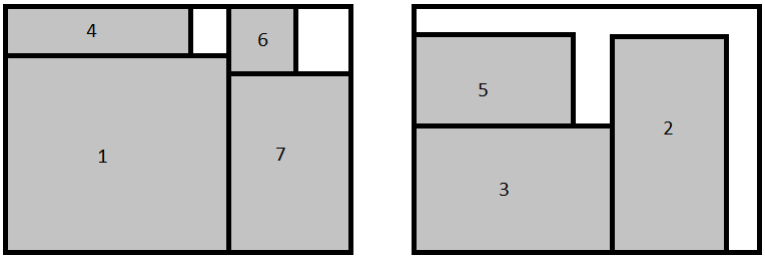
Exercises Session 9

Today, you will practice your integer programming skills. For that purpose, you will solve two-problems: (1) a two-dimensional bin-packing problem and (2) a Sudoku puzzle.

1 Exercise 1: Two-dimensional bin-packing.

You are given a set of rectangular items, where item i has width w_i and height h_i. The task is to pack all the items in identical bins of width W and height H, using as few bins as possible. Overlapping of the items is not allowed, and nor is cutting or rotating the items.

The figure below illustrates the idea:



You are provided with a model file and a data file. Unlike previous times, the model file also contains the objective and the most difficult constraint to get you started.

Task

- Solve the two-dimensional bin packing problem using CPLEX Optimization Studio

2 Exercise 2: Sudoku puzzle.

The Sudoku puzzle contains 9 rows, 9 columns and 9 grids. Each row, column and grid should contain the numbers from 1 to 9 exactly once, matching the given input data.

An example of an unsolved Sudoku puzzle is given below:

	2		5		1		9	
8			2		3			6
	3			6			7	
		1				6		
5	4						1	9
		2				7		
	9			3			8	
2			8		4			7
	1		9		7		6	

You are provided with a model file and a data file with several examples. The model file will also give you an idea of simple pre-processing and post-processing scripts that you will see more and more in the exercises to come.

Task

- Solve the Sudoku puzzle using CPLEX Optimization Studio
- Try it on different examples

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