ALGORITHMICS

Bachelor of Software Engineering - Course 2015-2016

SESSION 6

GOAL:

- **Backtracking**

Find the solution to solve a Nonogram

Due to the idiosyncrasies of its inhabitants, there are plenty of games (pastimes) with Chinese and Japanese (oriental in general) backgrounds. If we had to remember one, maybe we would think in Sudoku, but the reality is that it is just one of the many out there.

Well, one of them is the **Nonogram**. We can visit the website http://www.puzzle-nonograms.com/, where they explain what the game is and even we can generate boards of different sizes to help us to be adept at resolving "by hand" the game.

But it is clear that what interests us here is to design an algorithm, which once implemented allows the computer to solve the problem (in the shortest possible time as it has been our goal until now).

Example

With this case of size n=5, together with its solution:

				1	
				1	1
	2	3	3	1	1
3			**x**	**x**	**x**
1			**x**		
4	**x**	**x**	**x**	**x**	
2	**x**	**x**			
1	2		**x**		**x**	**x**

The input would be an input file in which the **first line is n**
Then, **n lines** with the constrains of every row
Finally, **n lines** with the constrains of every column

DEADLINE AND WORK TO BE DONE

You are asked to design and implement an algorithm using backtracking to solve this problem optimally.

It is requested to calculate the execution time for the proposed algorithm for the 5 annexed cases.

- case1.txt (n=5)
- case2.txt (n=10)
- case3.txt (n=15)
- case4.txt (n=20)
- case5.txt (n=25)

You should create an Eclipse Project with the name: ***lab06_backtracking<UO>*** *with all the needed files inside.*

You should deliver:

- *The source files for the classes, which have been programmed within the Eclipse project.*
- *A document (.docx or .pdf) with a brief explanation of the algorithm used and its complexity. The document should also include execution times for the 5 indicated cases.*

A task will be enabled in the virtual campus to upload the exercise. The deadline is 1 week and 1 day after the session ends.