This document describes the input files for sudoku and futoshiki logic puzzles.

For sudoku, a given initial grid can be

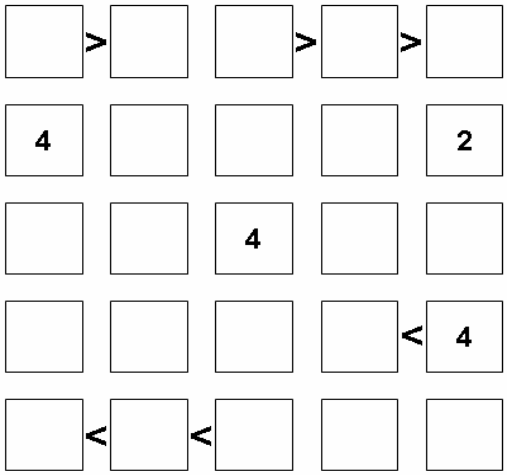
5	3			7				
6			1	9	5			
	9	8					6	
8				6				3
4			8		3			1
7				2				6
	6					2	8	
			4	1	9			5
				8			7	9

The input text file can be

```
9
5,3,0,0,7,0,0,0,0
6,0,0,1,9,5,0,0,0
0,9,8,0,0,0,0,6,0
8,0,0,0,6,0,0,0,3
4,0,0,8,0,3,0,0,1
7,0,0,0,2,0,0,0,6
0,6,0,0,0,0,2,8,0
0,0,0,4,1,9,0,0,5
0,0,0,0,8,0,0,7,9
```

The first line describes *n*, the dimension of the grid. For the sudoku problems of assignment-4, we assume a 9X9 grid. For 9X9 grid, there is going to be 81 integers.
The next *n* lines contains *n* integers each. A zero means a blank position.

For Futoshiki, a given initial grid can be



The input text file can be

```
5
0,0,0,0,0
4,0,0,0,2
0,0,4,0,0
0,0,0,0,4
0,0,0,0,0
6
(0,0), (0,1)
(0,2), (0,3)
(0,3), (0,4)
(3,4), (3,3)
(4,2), (4,1)
(4,1), (4,0)
```

The first line describes *n*, the dimension of the grid. For the futoshiki problems of assignment-4, we assume *n* to be between 5 to 9. For 5X5 grid, there are going to be 25 integers.
The next *n* lines contains *n* integers each. A zero means a blank position.
The next line after that contains a single integer *k* which mention the total number of inequalities.
The next k lines describes an inequality each: (x1,y1), (x2,y2) means cell position (x1,y1) is greater than cell position (x2,y2). Here x1, x2 are row positions and y1, y2 are column positions. Also, we assume row and column positions to be between 0 to (*n*-1).

It is possible to construct an input text file in alternative formats. For example, for the given futoshiki grid, we can describe the 25 cell positions by integers 1 to 25, starting from top left corner. Each of the inequalities can be described by two numbers x, y which means cell position x is greater than cell position y. So, the inequalities could have been described by the way shown below:

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

Cell positions in a 5X5 grid

```
6
1, 2
3, 4
4, 5
20, 19
22, 21
23, 22
```

The input files (12 input grids) for sudoku and futoshiki are given in the folders sudoku_instances and futoshiki_instances, respectively.
The folder sudoku_instances contains 12 files, each containing one grid.
The folder futoshiki_instances contains 6 files, each containing four grids, of which you should pick up the first two grids.

The distribution of 100 marks:

The implementation of inference and search algorithms: 30
The implementation of variable and value selection heuristics: 30
Report writing: 20
Overall understanding: 20