

# FUGITIVE WARRANT

## Instruction Booklet

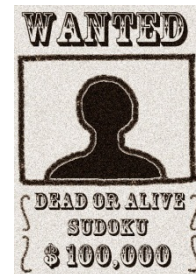
LMI November Sudoku Test

3-5 November 2012

110 minutes

Made by **Seungjae Kwak**

**Hwangrae Lee**



Name	Points
1. Classic Sudoku	4
2. Fugitive Warrant I	6
3. Killer Sudoku	12
4. Weighted Killer	18
5. Fake Treasure	11 + 13
6. Territorial Conflict	13
7. Fugitive Warrant II	7
8. Little Multiplication Killer	14
9. Little Killer with Extra Region	16
10. Twin Murderers	14
11. Clue	19
12. In Court	18
13. Jail Sudoku	11
14. Prison Break	24
Total	200

As a big fan of LMI, we're very honored to be authors of LMI monthly test. We prepared 14 problems with concept "fugitive warrant". In order to fit this theme, we had to make new variants. So there are only 2 well-known types of Sudoku. If you solve problems in order, you will meet the trace of criminals. We hope you enjoy the test.

- There are 14 problems.
- The duration of the test is 110 minutes.
- All grids are 9 by 9 although problems in this booklet are 6 by 6.
- Answer key for a problem is either two rows (left-to-right) or one row (left-to-right) and one column (top-to-bottom), indicated by an arrow.

## Bonus System

- If you submitted all grids and there is at most one false grid (with maximum 4 wrong digits), you can have bonus points.
- Your final score is then calculated using this formula:

$$\text{Final Score} = (\text{Total Points}) / (\text{Claim Time}) \times (110 \text{ minutes})$$

## Special Thanks to

- Tom Collyer for test solving and feedback
- LMI for hosting the contest

## Designed by

- Seungjae Kwak (**Kwaka**) 1,3,5,8,9,10,11,12,14
- Hwangrae Lee (**Spica**) 2,4,6,7,13

## 1. Classic Sudoku (9 x 9) (4pts)

Fill the grid with digits from 1 to 9, so that each digit occurs exactly once in every row, column and bolded 3x3 box. (1 to 6, 2x3 in the IB)

1					
2	3				
	4	5			
			6	5	
				4	3
					1

1	5	4	3	2	6
2	3	6	4	1	5
6	4	5	1	3	2
3	1	2	6	5	4
5	6	1	2	4	3
4	2	3	5	6	1

## 2. Fugitive Warrant I (9 x 9) (6pts)

Apply classic Sudoku rules.

The numbers 1,2 and 3 indicate criminals, and the numbers 8 and 9 indicate cops. (1 and 2 for criminals, and 6 for cops in the IB)

If two or more criminals share an edge, they form a syndicate.

A single criminal, who is not in a syndicate, can't touch a cop horizontally or vertically.

2			5		
5	3		2	6	4
					6
			3	4	
			4		2

2	4	6	5	3	1
5	3	1	2	6	4
4	5	3	1	2	6
6	1	2	3	4	5
1	2	4	6	5	3
3	6	5	4	1	2

### 3. Killer Sudoku (9 x 9) (12pts)

Apply classic Sudoku rules.

The number given at the top left of each cage is the sum of all digits inside that cage. No digit is repeated inside a cage.

13	8		6		13
		18			
10		18			10
	9			11	

13	8		6		13
5	4	1	2	3	6
2	3	6	5	1	4
6	5	3	4	2	1
10		18			10
1	2	4	6	5	3
4	9			11	
4	1	5	3	6	2
3	6	2	1	4	5

### 4. Weighted Killer (9 x 9) (18pts)

Apply classic Sudoku rules.

The number given at the top left of each cage is the sum of all digits in white cells plus DOUBLE of the sum of all digits in gray cells inside that cage. No digit is repeated inside a cage.

21			19		20
	9				
8		14			
	18				
			7		

21			19		20
5	6	4	2	1	3
3	1	2	4	5	6
6	9				
6	2	3	1	4	5
8		14			
1	4	5	6	3	2
2	18				
2	3	1	5	6	4
4	5	6	7	3	2

## 5. Fake Treasure (9 x 9) (11pts for classic + 13pts for toroidal)

There are two different grids.

Apply classic Sudoku rules for the left one.

For the right one, fill the grid with digits from 1 to 9. so that each digit appears exactly once in every row, column, outlined irregular region and group of single cells. Some of the irregular regions wrap around the grid from top to bottom and/or from left to right.

(1 to 6 in the IB) (Scattered-Toroidal Sudoku rules)

Moreover, digits in each cell of the shaded area are the same in both grids. In all other cells digits are different.

			3		5
		5		6	
			4		3
2		4			
	1		5		
4		3			

			4		3
		1		2	
			3		1
4		3			
	5		1		
6		4			

1	2	6	3	4	5
3	4	5	2	6	1
5	6	1	4	2	3
2	3	4	1	5	6
6	1	2	5	3	4
4	5	3	6	1	2

1	2	5	4	6	3
3	4	1	6	2	5
5	6	2	3	4	1
4	1	3	2	5	6
2	5	6	1	3	4
6	3	4	5	1	2

## 6. Territorial Conflict (9 x 9) (13pts)

Apply classic Sudoku rules.

If two same digits touch at a point, there is an X mark at the point.

All possible X marks are given.

		4			
5	1		*		
	6	*		2	3
3	2		*	6	
*			*	5	1
			*	3	

6	3	4	*	2	1	5	
5	1	2	*	4	3	6	
4	6	*	1	5	2	*	3
3	2	5	*	1	6	4	
*	2	4	3	*	6	5	1
1	5	6	*	3	4	2	

## 7. Fugitive Warrant II (9 x 9) (7pts)

Apply classic Sudoku rules.

The numbers 1,2 and 3 indicate criminals, and the numbers 8 and 9 indicate cops. (1 and 2 for criminals, and 6 for cops in the IB)

Each criminal has to share an edge with a cop.

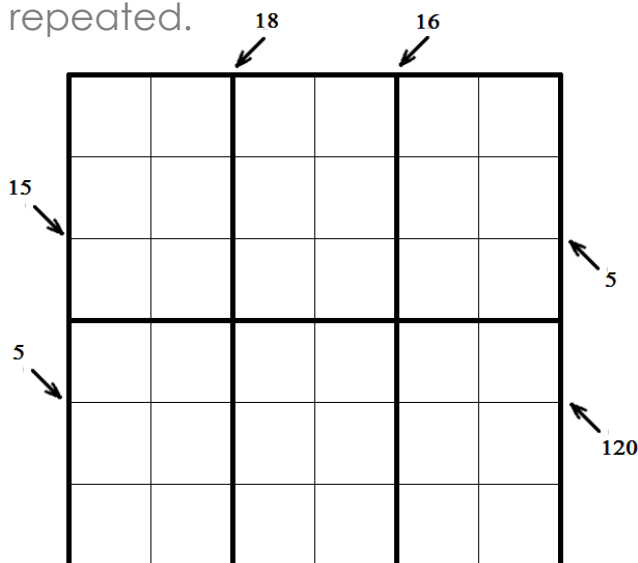
		5			
	3	1			
	2				
3					
	1		6	2	
		2		4	

2	4	5	3	1	6
6	3	1	4	5	2
1	2	6	5	3	4
3	5	4	2	6	1
4	1	3	6	2	5
5	6	2	1	4	3

## 8. Little Multiplication Killer (9 x 9) (14pts)

Apply classic Sudoku rules.

The numbers outside the grid provide the PRODUCTS of all digits in the indicated diagonal direction. Digits on those diagonals may be repeated.



4	6	3	1	5	2
3	5	4	2	6	1
1	2	5	6	4	3
2	3	6	4	1	5
5	4	1	3	2	6
6	1	2	5	3	4

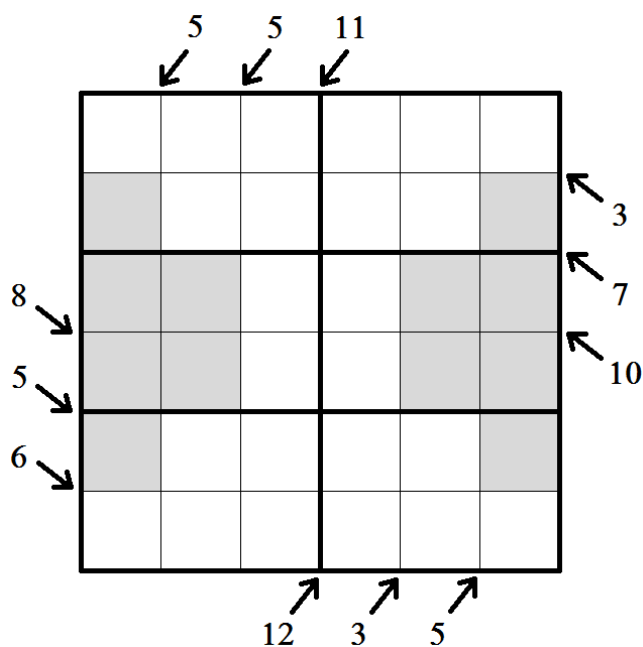
## 9. Little Killer with Extra Region (9 x 9) (16pts)

Apply classic Sudoku rules.

The numbers outside the grid provide the sums of all digits in the indicated diagonal direction. Digits on those diagonals may be repeated.

Each extra region must contain digits from 1 to 9. (1 to 6 in the IB)

The extra regions are of 9 cells each and are shaded with different shades of gray in the grid. (6 cells in the IB)



5	4	6	2	1	3
1	3	2	5	4	6
2	5	1	6	3	4
3	6	4	1	5	2
4	2	5	3	6	1
6	1	3	4	2	5

## 10. Twin Murderers (9 x 9) (14pts)

Fill the grid with digits from 1 to 9, so that each digit occurs exactly once in every row, column and outlined irregular region. (1 to 6 in the 1B)

The number given at the top left of each cage is either the SUM or the PRODUCT of all digits inside that cage. No digit is repeated inside a cage.

Two different grids are given—but the pattern of numbers entered in the left and right grids are identical.

30					
120					6
	120				
6		120			
			120		
				20	

20					
		7			
					2
	2				
				8	

5	6	2	3	1	4
4	5	6	1	2	3
1	4	5	6	3	2
3	2	4	5	6	1
2	1	3	4	5	6
6	3	1	2	4	5



## 11. Clue (9 x 9) (19pts)

Apply classic Sudoku rules.

Moreover, all inequalities must be respected.

The number in the shaded cell in the first 9x3 area is one of 1, 2 and 3 and the following rule is applied in the cells with circles.

The number in the shaded cell in the second 9x3 area is one of 4, 5 and 6 and the following rule is applied on the gray line.

The number in the shaded cell in the third 9x3 area is one of 7, 8 and 9 and the following rule is applied in the cells with squares.

Also, an arithmetic sequence is a sequence of numbers such that the difference between the consecutive terms is constant. (ex: 1-3-5-7-9)

○	6<				□	5<		
1	○	^9			6	□	∇7	
^	>2	○			∇	<8	□	
	<	○		7		>	□	
^	○	^	3	2	^	□	∇	
○	>	^		9	□	>	∇	
○	3<				□	2<		
5	○	^7			4	□	∇3	
^	<8	○			^	<7	□	

1. All Odd	4. All Odd	7. All Odd
2. All Even	5. Arithmetic Sequence	8. All Even
3. Extra Region	6. All Even	9. Extra Region

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

## 12. In Court (9 x 9) (18pts)

Apply classic Sudoku rules.

Number in a grey cell is the sum of all digits inside the cage above.

No digit is repeated inside a cage.

Moreover, all inequalities must be respected.

4		1	>	3
∇				5
5				
				∇
1	>	3		6

4	2	1	6 > 5	3		
3	6	5	4	1	2	
∇	2	3	4	1	6	5
5	1	6	2	3	4	
6	4	3	5	2	1	
1	5 > 2	3	4	6		

## 13. Jail Sudoku (9 x 9) (11pts)

Apply classic Sudoku rules.

The numbers 1,2 and 3 indicate three types of criminals.

A cage(jail) can contain only one type of criminals. (It may contain no criminal.)

Every criminal should be in a jail.

	4	3			
	1				
					2
			5	3	1
1			2	5	
		2			

2	4	3	1	6	5
6	1	5	3	2	4
5	3	1	6	4	2
4	2	6	5	3	1
1	6	4	2	5	3
3	5	2	4	1	6

## 14. Prison Break (9 x 9) (24pts)

Apply classic Sudoku rules.

Additionally, four colored squares contain the digits from 1 to 9.

(two colored rectangles, 1 to 6 in the IB) (Windoku rules)

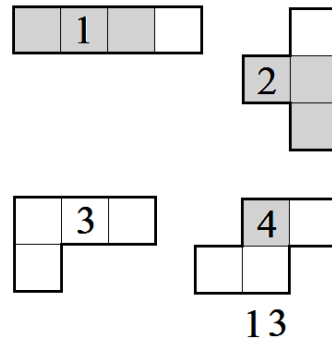
There are 12 pentominoes. For each pentomino, all numbers smaller than the given numbers inside it are given below.

Moreover, pentominoes can NOT overlap given numbers in the grid and can NOT overlap each other but can touch each other. They can NOT be rotated or reflected. The borders of 3x3 boxes were not visible in the pentomino pieces. (4 tetraminoes, 2x3 in the IB)

For example, 6 and 9 are given in a pentomino and 1 and 4 are listed below. Then, only known information about 14 is 'there can not be 2,3,5 in the pentomino'.

1. can't say anything about 6, 7, 8 and 9
2. 1 and 4 appear at least once
3. don't know how many 1,4 are in there)

				1	
				6	4
				2	
	2				
3	5				
	4				



6	3	4	5	1	2
5	1	2	3	6	4
1	6	5	4	2	3
4	2	3	1	5	6
3	5	6	2	4	1
2	4	1	6	3	5