ACSL

**American Computer Science League**

#### All-Star #8

**2012 - 2013**

**ACSL Tomography**

PROBLEM: X-ray computed tomography, also known as computed tomography (CT scan) or computed axial tomography (CAT scan), is a medical imaging procedure that utilizes computer-processed X-rays to produce 'slices' of specific areas of the body. In very simple terms, the technology uses a binary system to determine if there is something at a particular grid location or not. From that data an image can be reconstructed.

|  |  |  |
| --- | --- | --- |
|  |  | 1 |
|  |  | 0 |
| 1 | 0 |  |

|  |  |  |
| --- | --- | --- |
| 1 | 0 |  |
| 0 | 0 |  |
|  |  |  |

Given the above grid on the left with the numbers in the rightmost column representing the number of 1’s in each row and the numbers in the bottom row representing the number of 1’s in each column, it is possible to produce the unique grid on the right. Some combinations do not produce any grids and some produce multiple grids. Only those that produce unique grids are used here.

INPUT: There will be 10 lines of input. Each line will contain two strings of numerical characters. The first string will represent the border totals for the rows and the second string will represent the border totals for the columns. The number of rows and columns will be the same and their maximum number will be 5. The input for the above example would be 10, 10.

OUPUT: For each line of input, print the unique grid produced. Grid lines are not required but the cell entries must be aligned vertically and horizontally.

.SAMPLE INPUT SAMPLE OUTPUT

|  |  |
| --- | --- |
| 1 | 0 |
| 0 | 0 |

|  |  |
| --- | --- |
| 1 | 1 |
| 0 | 0 |

2.

1.

1. 10, 10  
2. 20, 11  
3. 21, 21  
4. 100, 001  
5. 300, 111  
6. 031, 211  
7. 102, 210  
8. 111, 300  
9. 2002, 2200  
10. 2322, 4410

|  |  |
| --- | --- |
| 1 | 1 |
| 1 | 0 |

|  |  |  |
| --- | --- | --- |
| 0 | 0 | 1 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |

3..

4.

|  |  |  |
| --- | --- | --- |
| 1 | 1 | 1 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |

|  |  |  |
| --- | --- | --- |
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 1 | 0 | 0 |

5.

6.

|  |  |  |
| --- | --- | --- |
| 1 | 0 | 0 |
| 0 | 0 | 0 |
| 1 | 1 | 0 |

|  |  |  |
| --- | --- | --- |
| 1 | 0 | 0 |
| 1 | 0 | 0 |
| 1 | 0 | 0 |

7.

8.

|  |  |  |  |
| --- | --- | --- | --- |
| 1  9. | 1 | 0 | 0  10. |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 0 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 0 | 0 |

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TEST DATA

TEST INPUT TEST OUTPUT

|  |  |
| --- | --- |
| 0 | 0 |
| 0 | 0 |

|  |  |
| --- | --- |
| 1 | 1 |
| 0 | 1 |

2.

1.

1. 00, 00  
2. 21, 12  
3. 232, 313  
4. 333, 333  
5. 301, 121  
6. 231, 312  
7. 1230, 0321  
8. 2310, 1023  
9. 4321, 1234  
10. 50000, 11111

|  |  |  |
| --- | --- | --- |
| 1 | 1 | 1 |
| 1 | 1 | 1 |
| 1 | 1 | 1 |

|  |  |  |
| --- | --- | --- |
| 1 | 0 | 1 |
| 1 | 1 | 1 |
| 1 | 0 | 1 |

4.

3.

|  |  |  |
| --- | --- | --- |
| 1 | 1 | 1 |
| 0 | 0 | 0 |
| 0 | 1 | 0 |

|  |  |  |
| --- | --- | --- |
| 1 | 0 | 1 |
| 1 | 1 | 1 |
| 1 | 0 | 0 |

5.

6.

|  |  |  |  |
| --- | --- | --- | --- |
| 0 | 0 | 1 | 1 |
| 1 | 0 | 1 | 1 |
| 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 0 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 |

8.

7.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | 1 | 1 |
| 0 | 1 | 1 | 1 |
| 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 1 |

10.

9.