

**Preview Puzzle Instructions**  
 U.S. Sudoku Team Qualifying Test  
 September 6, 2015

The US Qualifying test will start on Sunday September 6, at 1pm EDT (10am PDT) and last for 2 ½ hours. Here are the instructions and examples for the puzzles that will appear on the test.

Part 1 – Classics

1. **Classic Sudoku (Wei-Hwa Huang) – 5 points**
2. **Classic Sudoku (Wei-Hwa Huang) – 10 points**
3. **Classic Sudoku (Wei-Hwa Huang) – 15 points**
4. **Classic Sudoku (Wei-Hwa Huang) – 15 points**

Place the digits 1 through 9 into the empty cells in the grid (a single digit per cell) so that each digit appears exactly once in each of the following regions: the nine rows, the nine columns, and the nine outlined 3x3 regions.

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

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

- Answer 1: Enter the fourth row of digits, followed by the ninth row of digits.  
 Answer 2: Enter the first row of digits, followed by the ninth row of digits.  
 Answer 3: Enter the fourth row of digits, followed by the seventh row of digits.  
 Answer 4: Enter the third row of digits, followed by the fifth row of digits.

### 5. Tight Fit Sudoku (Wei-Hwa Huang) – 10 points

Follow Classic Sudoku Rules. In the grid there are some cells with slashes. Two numbers go into these cells, and the smaller number must always be entered above the larger number.

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| 7/ |    |    | /  |    | 1/ |
|    | 4/ | 5/ | 7/ |    |    |
|    | 6/ |    |    | /9 | /  |
| /  | 3/ |    |    | /4 |    |
|    |    | /7 | /4 | /5 |    |
| /5 |    | /  |    |    | /8 |

|     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|
| 7/8 | 2   | 3   | 5/9 | 6   | 1/4 |
| 1   | 4/9 | 5/6 | 7/8 | 2   | 3   |
| 4   | 6/7 | 1   | 3   | 8/9 | 2/5 |
| 2/9 | 3/5 | 8   | 6   | 1/4 | 7   |
| 6   | 8   | 2/7 | 1/4 | 3/5 | 9   |
| 3/5 | 1   | 4/9 | 2   | 7   | 6/8 |

Answer: Enter the third row of digits, followed by the fifth row of digits.

### 6. Diagonal Sudoku (Wei-Hwa Huang) – 10 points

Follow Classic Sudoku Rules. Additionally, each digit appears exactly once in each of the two main diagonals.

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   | 8 |   |   |   | 2 |   |   |
|   | 7 |   | 8 |   | 9 |   | 6 |   |
| 9 |   |   |   | 6 |   |   |   | 8 |
|   |   |   |   |   |   |   |   |   |
|   |   | 2 |   |   |   | 9 |   |   |
|   | 5 |   | 9 |   | 6 |   | 3 |   |
| 8 |   |   |   | 4 |   |   |   | 5 |
|   | 4 |   | 3 |   | 2 |   | 8 |   |
|   |   | 6 |   |   |   | 4 |   |   |

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

Answer: Enter the third row of digits, followed by the eighth row of digits.

### 7. Consecutive Sudoku (Wei-Hwa Huang) – 20 points

Follow Classic Sudoku Rules. Additionally, the bars in the grid indicate *all* adjacent pairs of consecutive digits.

|   |   |  |   |   |  |  |   |
|---|---|--|---|---|--|--|---|
| 7 |   |  |   | 8 |  |  | 1 |
|   | 1 |  |   |   |  |  | 3 |
|   |   |  |   |   |  |  |   |
|   |   |  |   |   |  |  | 7 |
|   |   |  | 1 |   |  |  |   |
| 5 |   |  |   |   |  |  |   |
|   |   |  |   |   |  |  |   |
|   | 2 |  |   |   |  |  | 1 |
| 1 |   |  | 8 |   |  |  | 4 |

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

Answer: Enter the fifth row of digits, followed by the seventh row of digits.

### 8. Irregular Sudoku (Wei-Hwa Huang) – 15 points

Follow Classic Sudoku Rules, except the outlined regions are not uniform 3x3 boxes but instead have irregular shapes.

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 9 |   | 4 |   | 1 |   | 5 |   |
| 6 |   |   |   |   |   |   |   | 4 |
|   |   | 7 |   | 9 |   | 2 |   |   |
| 9 |   |   |   |   |   |   |   | 1 |
|   |   | 6 |   |   |   | 7 |   |   |
| 8 |   |   |   |   |   |   |   | 5 |
|   |   | 2 |   | 1 |   | 4 |   |   |
| 7 |   |   |   |   |   |   |   | 6 |
|   | 8 |   | 1 |   | 9 |   | 6 |   |

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

Answer: Enter the second row of digits, followed by the sixth row of digits.

### 9. Even/Odd Sudoku (Wei-Hwa Huang) – 20 points

Follow Classic Sudoku Rules. Additionally, cells with pink circles must contain odd digits, and cells with blue squares must contain even digits.

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

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

Answer: Enter the second row of digits, followed by the eighth row of digits.

### 10. Killer Sudoku (Wei-Hwa Huang) – 20 points

Follow Classic Sudoku Rules. Additionally, the sum of the numbers in each dotted outlined region is equal to the corresponding number given in a corner of the outline. Note: no digit is repeated within a given outlined region.

|    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|
| 12 |    | 3  |    | 12 |    | 30 |    |    |
| 11 |    | 14 | 15 |    | 6  |    |    | 5  |
| 14 |    |    | 13 |    | 12 |    |    |    |
| 9  |    |    |    | 15 |    |    |    | 18 |
| 15 |    | 26 |    | 8  |    |    |    |    |
|    | 11 |    |    | 21 |    | 14 | 5  |    |
| 16 | 19 | 7  |    |    |    |    | 17 |    |
|    |    | 12 |    | 13 |    |    | 6  |    |
|    |    |    | 9  |    | 16 |    | 9  |    |

|    |   |    |    |    |    |    |    |   |    |    |    |   |   |
|----|---|----|----|----|----|----|----|---|----|----|----|---|---|
| 12 | 3 | 9  | 3  | 1  | 2  | 12 | 4  | 8 | 30 | 6  | 7  | 5 |   |
| 11 | 4 | 7  | 14 | 2  | 15 | 9  | 6  | 6 | 5  | 1  | 8  | 5 | 3 |
| 14 | 8 | 6  | 5  | 13 | 7  | 1  | 12 | 3 | 9  | 4  | 2  |   |   |
| 9  | 1 | 8  | 7  |    | 3  | 2  | 15 | 4 | 5  | 6  | 18 | 9 |   |
| 15 | 6 | 4  | 26 | 9  | 5  | 8  | 1  | 3 | 2  | 7  |    |   |   |
|    | 5 | 12 | 3  | 6  | 29 | 7  | 14 | 8 | 5  | 1  | 4  |   |   |
| 16 | 7 | 5  | 19 | 7  | 6  | 1  | 3  | 2 | 4  | 17 | 9  | 8 |   |
|    | 9 | 3  | 12 | 4  | 8  | 13 | 7  | 6 | 2  | 6  | 5  | 1 |   |
|    | 2 | 1  | 8  | 9  | 4  | 5  | 16 | 9 | 7  | 9  | 3  | 6 |   |

Answer: Enter the second row of digits, followed by the eighth row of digits.

End of Part 1

### 1. Staircase Sudoku (Wei-Hwa Huang) – 10 points

Follow Classic Sudoku Rules; some rows and columns have gaps.

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

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

Answer: Enter the seventh row of digits, followed by the eleventh row of digits.

### 2. Tile Sudoku (Wei-Hwa Huang) – 10 points

Follow Classic Sudoku Rules for each of the 12 rows, 12 columns, and the nine outlined 4x4 regions. Note that some cells appear in more than one row and/or column.

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

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

Answer: Enter the seventh row of digits, followed by the tenth row of digits.

### 3. Dynasty Sudoku (Wei-Hwa Huang) – 10 points

Follow Classic Sudoku Rules using the digits 1 through 7 and two black cells in each row, column, and 3x3 region. Additionally, the black cells do not touch each other on the edges, and the white cells must form a single connected region.

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 |   |   |   |   |   |   |   |
|   |   | 3 | 4 | 5 | 6 |   |   |   |
|   |   |   |   |   |   |   | 6 | 3 |
|   | 4 |   | 5 |   |   |   | 1 |   |
| 7 | 3 | 5 |   |   |   | 6 | 2 | 4 |
|   | 6 |   |   |   | 4 |   | 3 |   |
| 6 | 1 |   |   |   |   |   |   |   |
|   |   |   | 2 | 4 | 1 | 5 |   |   |
|   |   |   |   |   |   |   | 7 | 1 |

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 6 | 3 |   | 7 | 4 | 5 |   |
|   | 7 | 3 | 4 | 5 | 6 | 1 |   | 2 |
| 5 |   | 4 | 1 |   | 2 | 7 | 6 | 3 |
| 2 | 4 |   | 5 | 6 | 3 |   | 1 | 7 |
| 7 | 3 | 5 |   | 1 |   | 6 | 2 | 4 |
|   | 6 | 1 | 7 | 2 | 4 |   | 3 | 5 |
| 6 | 1 | 2 |   | 7 | 5 | 3 | 4 |   |
| 3 |   | 7 | 2 | 4 | 1 | 5 |   | 6 |
| 4 | 5 |   | 6 | 3 |   | 2 | 7 | 1 |

Answer: Enter the third row of digits, followed by the eighth row of digits. Enter 0 for the black cells.

### 4. Outside Sudoku (Wei-Hwa Huang) – 10 points

Follow Classic Sudoku Rules. Digits are given outside of the grid, and each digit must appear in the first region (three cells) in the corresponding row/column.

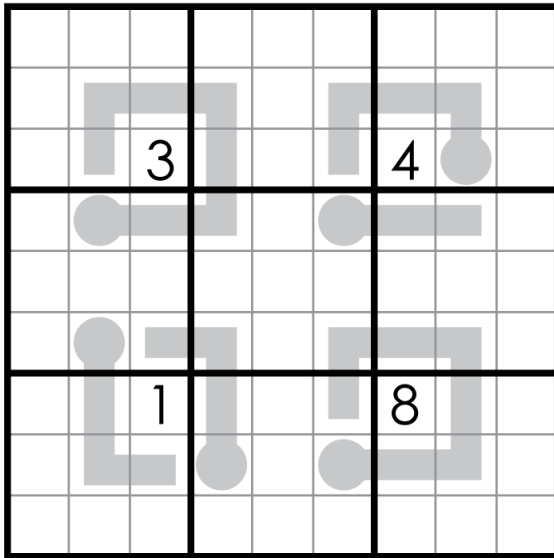
|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 1 | 2 | 3 | 4 | 5 | 6 |   |   |
|   | 4 | 5 | 6 | 7 | 8 | 9 |   |   |
|   |   |   |   |   |   |   | 6 | 9 |
|   |   |   |   |   |   |   | 2 | 8 |
| 8 |   |   |   |   |   |   | 5 | 7 |
| 2 |   |   |   |   |   |   | 4 | 6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

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

Answer: Enter the second row of digits, followed by the sixth row of digits.

### 5. Thermo Sudoku (Wei-Hwa Huang) – 15 points

Follow Classic Sudoku Rules. Additionally, the digits in each "thermometer"-shaped region must be strictly increasing from the circular bulb to the end. Some thermometers may share the same starting bulb.

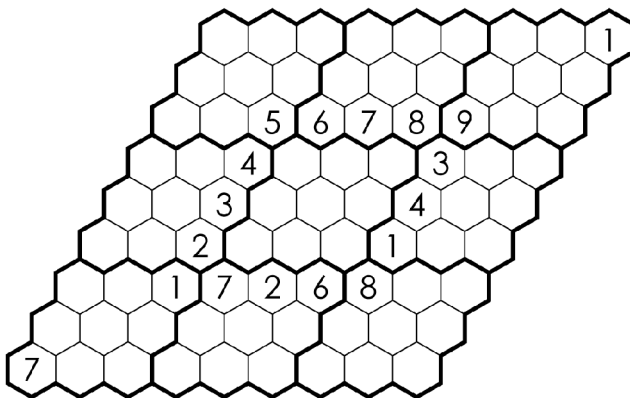


|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 4 | 2 | 5 | 1 | 7 | 3 | 9 | 6 | 8 |
| 1 | 8 | 7 | 6 | 9 | 4 | 3 | 2 | 5 |
| 6 | 9 | 3 | 5 | 2 | 8 | 4 | 1 | 7 |
| 8 | 1 | 2 | 3 | 6 | 5 | 7 | 9 | 4 |
| 5 | 7 | 6 | 9 | 4 | 2 | 1 | 8 | 3 |
| 3 | 4 | 9 | 8 | 1 | 7 | 6 | 5 | 2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

Answer: Enter the third row of digits, followed by the fifth row of digits.

### 6. Hexagon Sudoku (Wei-Hwa Huang) – 15 points

Follow Classic Sudoku Rules. Additionally, digits do not repeat in any of the three directions in which the hexagonal cells share edges.



Answer: Enter the third row of digits, followed by the sixth row of digits.

## 7. Bent Diagonal Sudoku (Wei-Hwa Huang) – 20 points

Follow Classic Sudoku Rules. Additionally, each digit appears exactly once in each of the four L-shaped bent "diagonals" (as indicated by the dotted lines that turn 90 degrees at the center of the grid).

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 4 |   |   |   |   |   |   |   | 9 |
|   |   |   |   | 2 |   |   |   |   |
|   |   |   | 4 | 5 | 9 |   |   |   |
|   |   | 3 |   |   |   | 8 |   |   |
|   | 4 | 8 |   |   |   | 9 | 3 |   |
|   |   | 6 |   |   |   | 5 |   |   |
|   |   |   | 2 | 6 | 3 |   |   |   |
|   |   |   |   | 1 |   |   |   |   |
| 6 |   |   |   |   |   |   |   | 2 |

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

Answer: Enter the fourth row of digits, followed by the eighth row of digits.

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### 8. Triple Double Sudoku (Wei-Hwa Huang) – 20 points

Follow Classic Sudoku Rules. Additionally, the three shaded regions in the first grid correspond exactly to the three shaded regions in the second grid; which region corresponds to which is for you to determine.

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

|   |   |   |  |   |   |   |   |   |   |
|---|---|---|--|---|---|---|---|---|---|
|   |   |   |  | 7 | 4 | 3 | 1 | 2 | 5 |
|   |   |   |  | 5 |   |   |   |   | 8 |
|   |   |   |  | 2 |   |   |   | 7 |   |
|   | 3 |   |  |   |   |   | 9 |   |   |
| 2 |   | 1 |  |   |   | 5 |   |   |   |
|   | 5 |   |  |   | 7 |   |   |   | 4 |
|   |   |   |  | 1 |   |   |   |   | 3 |
|   |   |   |  | 3 | 8 | 2 | 4 | 9 | 7 |
|   |   |   |  |   |   |   |   |   |   |

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

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

Answer: For the first grid, enter the first row of digits. For the second grid, enter the seventh column of digits.

### 9. T Sudoku (Wei-Hwa Huang) – 25 points

Follow Classic Sudoku Rules using the indicated letters. Additionally, the triangles in the grid indicate *all* adjacent pairs of digits whose sum starts with the letter "T" (three, ten, twelve, and thirteen).

|  |   |  |  |  |  |  |  |   |
|--|---|--|--|--|--|--|--|---|
|  | 2 |  |  |  |  |  |  |   |
|  |   |  |  |  |  |  |  |   |
|  |   |  |  |  |  |  |  |   |
|  |   |  |  |  |  |  |  |   |
|  |   |  |  |  |  |  |  |   |
|  |   |  |  |  |  |  |  |   |
|  |   |  |  |  |  |  |  |   |
|  |   |  |  |  |  |  |  | 8 |

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

Answer: Enter the second row of digits, followed by the fourth row of digits.

### 10. Roman Numeral Sudoku (Wei-Hwa Huang) – 30 points

Follow Classic Sudoku Rules. Additionally, a clue limits its cell to only those digits whose Roman numeral representation contains the clue text. For example, you can only enter a 4, 5, 6, 7, or 8 into a cell containing a "V" clue.

|     |     |     |      |     |    |     |      |      |    |
|-----|-----|-----|------|-----|----|-----|------|------|----|
|     | 1   | 2   | 3    | 4   | 5  | 6   | 7    | 8    | 9  |
|     | I   | II  | III  | IV  | V  | VI  | VII  | VIII | IX |
| I   |     |     | VI   | I   | II | VI  | II   |      |    |
|     | II  |     |      | VI  | X  | I   | II   | V    |    |
|     |     | III |      |     | VI | I   | II   | III  |    |
| II  |     |     | IV   |     |    | VI  | X    | III  |    |
| III | V   |     |      | V   |    |     | VI   | I    |    |
| V   | III | V   |      |     | VI |     |      | VI   |    |
| II  | V   | III | V    |     |    | VII |      |      |    |
| I   | IV  | VI  | III  | II  |    |     | VIII |      |    |
|     | II  | VI  | II   | III | V  |     |      | IX   |    |
| IV  | IX  | I   | VIII | III | II | VI  | VII  | V    |    |
| 7   | 8   | 2   | 5    | 6   | 9  | 1   | 3    | 4    |    |
| 5   | 6   | 3   | 1    | 4   | 7  | 9   | 2    | 8    |    |
| 2   | 1   | 5   | 4    | 7   | 6  | 8   | 9    | 3    |    |
| 8   | 7   | 9   | 2    | 5   | 3  | 4   | 6    | 1    |    |
| 6   | 3   | 4   | 9    | 1   | 8  | 2   | 5    | 7    |    |
| 3   | 5   | 8   | 6    | 9   | 4  | 7   | 1    | 2    |    |
| 9   | 4   | 7   | 3    | 2   | 1  | 5   | 8    | 6    |    |
| 1   | 2   | 6   | 7    | 8   | 5  | 3   | 4    | 9    |    |

Answer: Enter the second row of digits, followed by the eighth row of digits. Enter decimal digits.

End of Part 2