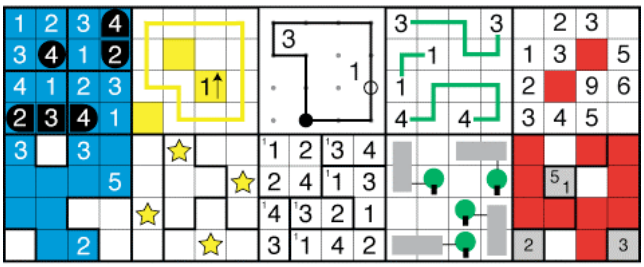
2011 Double



Decathlon

by Thomas Snyder
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The Olympic Decathlon tests a wide range of physical skills, on the track and on the field, to identify the world's best athletes. Only well-balanced performers that can succeed in all of the disciplines will triumph. This Double Decathlon will similarly test a range of mental skills to identify the world's best logic puzzle solvers.

There are ten different puzzle disciplines in this competition. Some are "classic" puzzles, while others are variants (a new version of a classic style) or hybrids (a combination of classic styles). Each type will have two puzzles: an easier/smaller puzzle worth 20 points and a harder/larger puzzle worth 50 points. The competition will last for 120 minutes.

BONUS:
To reward solvers with the broadest set of skills, bonuses will be awarded for solving puzzles across all the puzzle types. A total of 300 points of bonus can be earned based on solving either one or both puzzles across the various types as follows:

For solving <u>at least 1</u> puzzle	in all 10 puzzle types:	+100 points
	in 9 of 10 puzzle types:	+60 points
	in 8 of 10 puzzle types:	+30 points
	in 7 of 10 puzzle types:	+10 points
For solving <u>both</u> puzzles	in all 10 puzzle types:	+200 points (+300 total bonus)
	in 9 different puzzle types:	+120 points
	in 8 different puzzle types:	+60 points
	in 7 different puzzle types:	+20 points

An individual solving all of the puzzles can earn 700 puzzle points and 300 bonus points for a total of 1000 points.

INSTANT GRADING:

This test will mark the debut on LMI of INSTANT GRADING where a solver can turn in any individual puzzle once finished and receive confirmation that the solution is correct or not.

The goal of INSTANT GRADING is to increase the emphasis in the final ranking on puzzle solving skill and not answer entry skill. It is my belief that most typos in answer entry can be quickly fixed by a solver if the solver receives notification of a mistake. This system should separate puzzle mistakes (worth no puzzle points) from typos (worth some puzzle points) without requiring an arbitrary judgment of whether an answer is "close enough" to deserve credit when this cannot be consistently done for all types of errors on all types of puzzles.

All wrong submissions, including typos, will earn a 4-point penalty. This value was chosen to equal roughly thirty seconds of test value, a similar penalty to that used in many World Puzzle Championship playoffs when submitting an incorrect solution. It is not possible to earn additional penalties for submitting the same wrong answer twice, but different incorrect entries will earn multiple penalties. For example, if a solver makes a typographical error on an easy puzzle followed by the correct answer, he/she will earn 20 – 4 = 16 points for that puzzle. If a solver enters five different random guesses for a puzzle and is wrong each time, never getting the correct answer, that solver will earn –20 points for that puzzle. It is possible to earn a negative score in this competition, but no one who is making an honest attempt to solve the puzzles should earn a negative score.

INSTANT GRADING PRACTICE AND INSTRUCTIONS:

A practice site, using the 10 puzzle answers in this booklet, will be open before the competition on the Double Decathlon test page for participants to get used to the system.

Solvers can submit solutions during the test in two ways. First, solvers can click on an individual submission button beside the puzzle itself. The individual submission button will only be clickable when a properly formatted string is entered for that puzzle. Alternatively, clicking "Submit All Answers" on the left of the screen will submit *all* newly entered answers. I recommend using the individual submission button because it will be impossible to submit an incorrect answer that is missing a letter/number or has the "easy" answer in the "hard" spot. "Submit All Answers" will evaluate any text in the box, and penalize these kinds of errors.

Submitting an answer to a puzzle will result in one of two signals being displayed. A correct answer reveals a green value (20 or 50) for the puzzle points and deactivates the text box for further entry. A wrong answer will reveal a red X and the text box will still be active for further entry. Even if submitting multiple answers at one time, all individual answers will show these signals beside the answer entry box upon submission. With each submission, an updated report of the number of correct puzzles and total solved puzzle points will be displayed.

EARLY FINISHERS:

Any solver who finishes all puzzles correctly will be credited with points on a prorated basis according to this formula, with the completion time rounded to the nearest second:

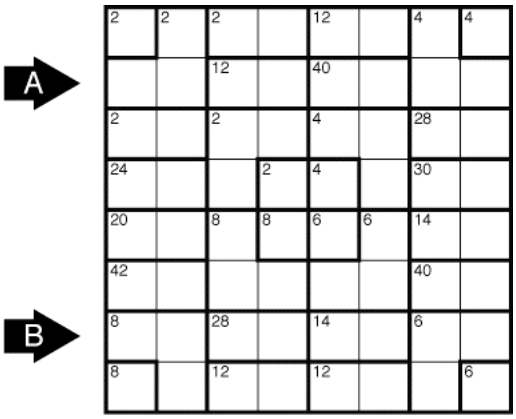
$$\text{Final Score} = (1000 - \text{Penalties}) \times \text{Total Time} / \text{Completion Time}$$

PUZZLE INSTRUCTIONS:

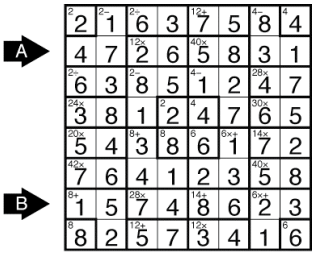
1. TomTom – "Classic"

(20 point = 6x6 grid; 50 point = 8x8 grid)

Place the digits 1 through 6 (1 through 8 in the larger grid) into the empty cells in the grid (a single digit per cell) so that each digit appears exactly once in each of the rows and columns. The value in the upper-left of each bold region indicates the result after some mathematical operation (addition, subtraction, multiplication, or division) is applied to the numbers in that region. For division and subtraction, start from the largest number. For example, a region with the digits 2, 4, and 1 would equal 1 by subtraction (4–2–1 = 1) or 2 by division (4÷2÷1 = 2). Numbers can repeat in a region provided they do not repeat in any row or column.



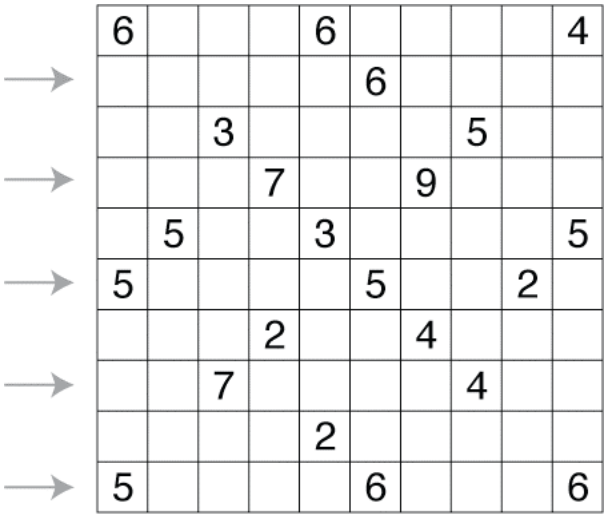
Answer Entry: Enter the digits in the indicated rows marked by the arrows A and B from left to right. For the example, the answer is **47265831, 15748623**.



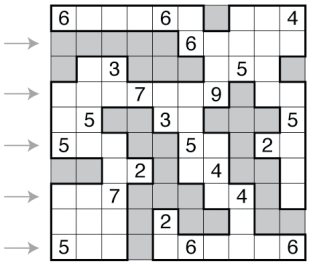
2. Cave – "Classic"

(20 point = 8x8 grid; 50 point = 10x10 grid)

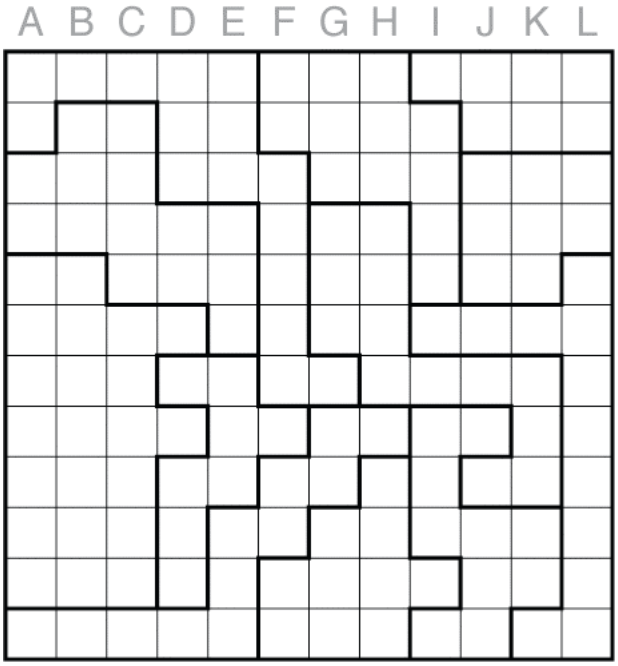
Draw a single closed loop along the grid lines so that all the numbered cells are inside the loop. The loop cannot intersect or overlap with itself. Additionally, each number equals the count of *interior* cells that are directly in line (horizontally or vertically) with that number's cell, including the cell itself.



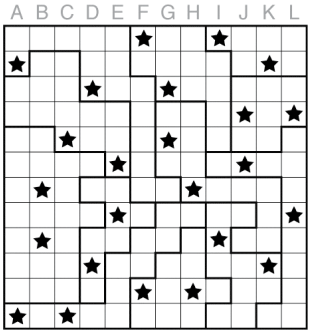
Answer Entry: For each marked row, enter the number of cells in the longest continuous horizontal group belonging to the ***interior*** *of the loop in that row, starting from the top and continuing to the bottom. For the example, the answer is* **57336**.



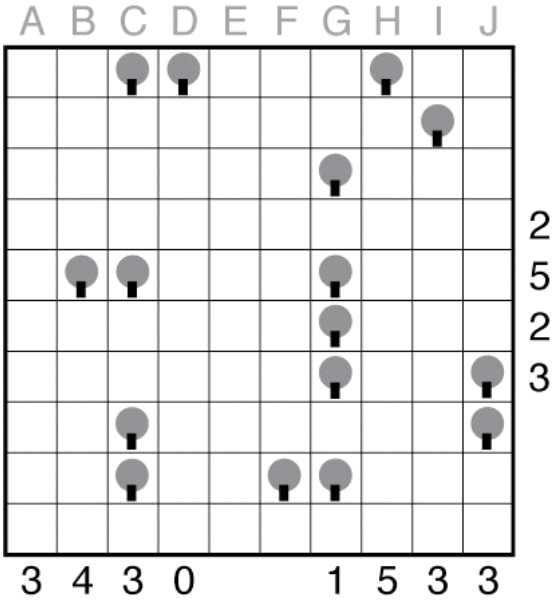
3. Star Battle – "Classic"
(20 point = 9x9 grid; 50 point = 12x12 grid)
Place stars into some cells in the grid so that each row, column, and region contains exactly two stars. Stars cannot be placed in adjacent cells, not even diagonally.



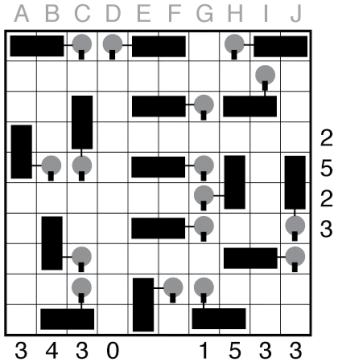
Answer Entry: For each row, enter the letter of the column containing the left-most star in that row, starting at the top row and continuing to the bottom row. For the example, the answer is **FADJCEBEBDFA**.



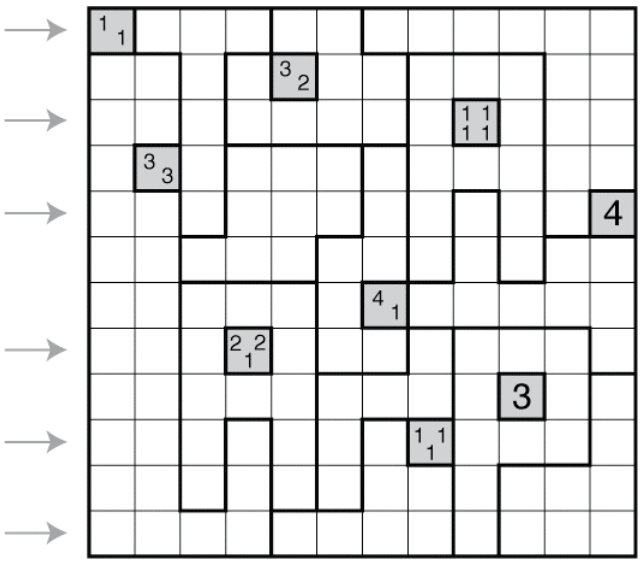
4. Big Tent Party – "Variant"
(20 point = 8x8 grid; 50 point = 10x10 grid)
Place a tent, covering two adjacent cells, next to each tree so that the tent and tree share one edge. Tents can be oriented in any direction but cannot occupy cells containing other trees. Tents do not touch each other, not even diagonally. The numbers outside the grid indicate the number of cells covered by tents in that row or column.



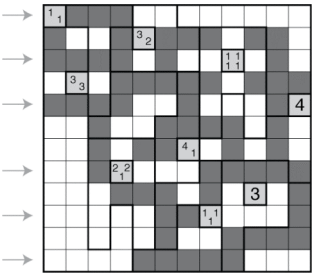
Answer Entry: For each row, enter the letter of the column containing the left-most tent segment in that row, starting at the top row and continuing to the bottom row. Enter X if there is no tent in that row. For the example, the answer is **AXCAAHBBEB**.



5. Make Room for Tapa – "Variant"
(20 point = 10x10 grid; 50 point = 12x12 grid)
Shade some cells black to form a continuous wall. There cannot be a 2x2 square of cells that are all shaded. Numbers in cells indicate the length of connected black cell groups in the neighboring cells; if there is more than one number in a cell, then there must be at least one white cell between each of the indicated black cell groups. Cells with numbers cannot be a part of the wall. The grid is also divided into regions by bold lines; *exactly five cells* must be shaded black in each region.

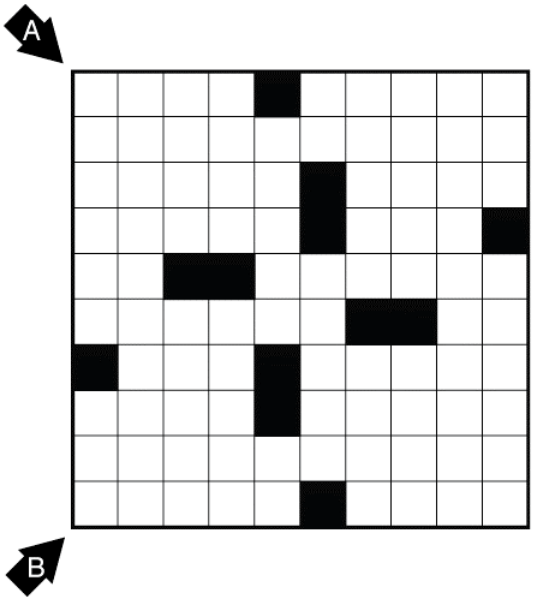


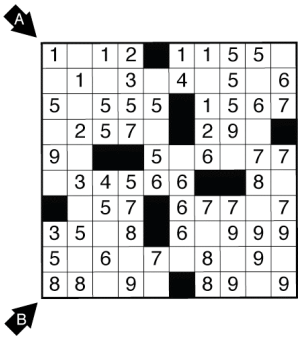
Answer Entry: For each marked row, enter the number of cells in the longest continuous horizontal group of shaded cells in that row, starting at the top and continuing to the bottom. If this value is a double-digit number, enter the units digit of the number. For the example, the answer is **344525**.



6. Gapped Number Fill – "Variant"
(20 point = 8x8 grid; 50 point = 10x10 grid)
Place the listed numbers into the grid, reading across and down. Entries may have one of more gaps, including at the beginning and end of the number. Gaps are exactly one cell (i.e. no two empty cells can share an edge). Numbers are grouped by their length in the grid.

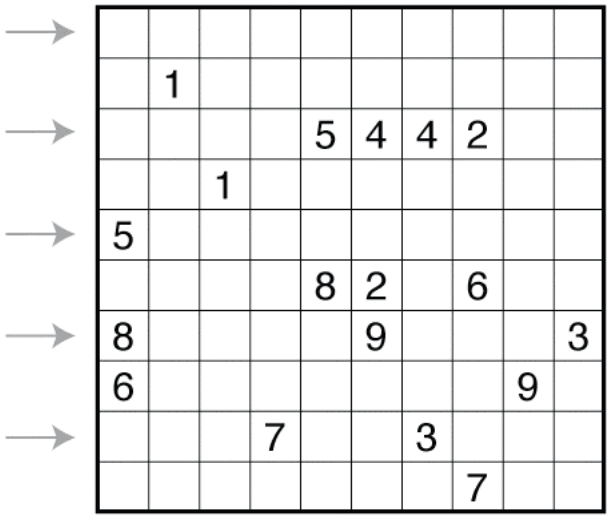
Answer Entry: Enter the digits in the two main diagonals, using X for any empty cell or black cell, in the direction of the two arrows starting with arrow A. For the example, the answer is **1157567999, 8XX76X25XX**.



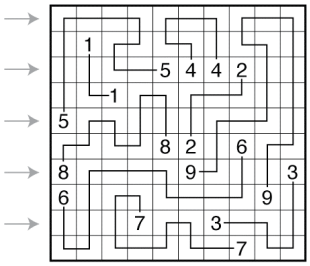


2: 14, 7, 8, 9
3: 29, 358, 57, 67
4: 112, 155, 1567, 2357, 358, 788, 799, 899
5: 1126, 1155, 257, 456, 5555, 556, 5559, 5789, 666, 6777, 6999, 889
6: 159, 34566, 5677, 7799
10: 12358, 13456, 56789, 567899

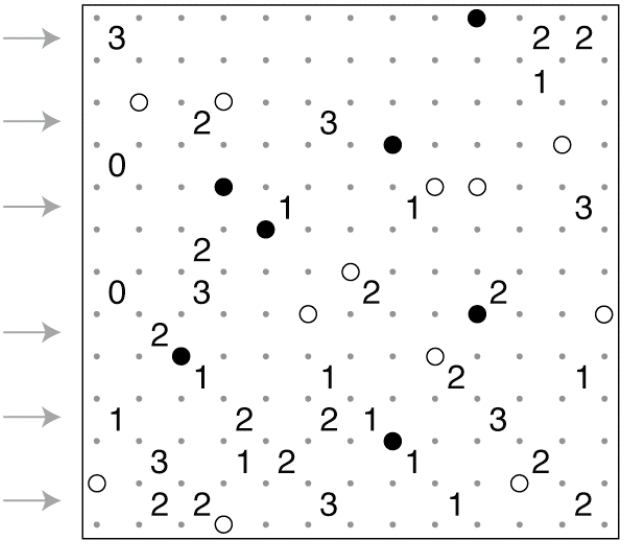
7. Turning Points – "Variant"
(20 point = 10x10 grid; 50 point = 12x12 grid)
Draw paths through adjacent white cells connecting each pair of numbers, using every white cell in the grid in exactly one path. The path connecting each number N must contain exactly N turns.



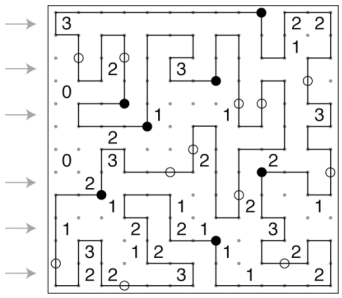
Answer Entry: For each marked row, enter the number of cells of the longest horizontally connected group in that row, starting at the top and continuing to the bottom. If this number is 10 or greater, enter the units digit of the number. For the example, the answer is ***43343****.*



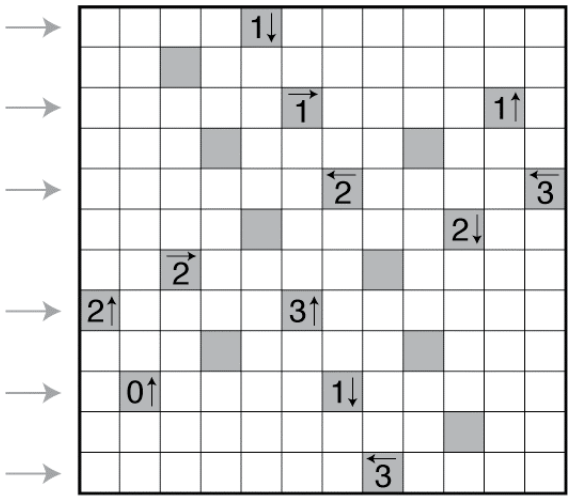
8. Loop the Loops – "Hybrid"
(20 point = 10x10 grid; 50 point = 12x12 grid)
Draw a single closed loop that connects neighboring dots horizontally or vertically (but not diagonally). The loop cannot intersect of overlap with itself. Some numbers appear in the grid as clues; as in a Slitherlink puzzle, a numbered square indicates exactly how many of its four edges are used by the loop. Some circles (either white or black) also appear in the grid as clues; as in a Masyu puzzle, the loop must pass through all of these circles. When passing through a black circle, the path must make a 90 degree turn and extend at least two dots in both directions. When passing through a white circle, the path must go straight and must turn at at least one of the adjacent dots.



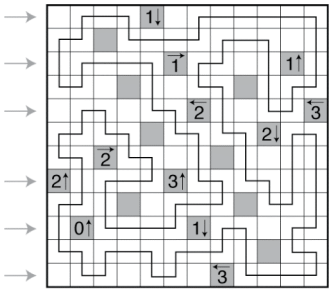
Answer Entry: For each marked row, enter the number of cells of the longest horizontally connected group of cells inside the loop in that row, starting at the top and continuing to the bottom. If this number is 10 or greater, enter the units digit of the number. For the example, the answer is **933555**.



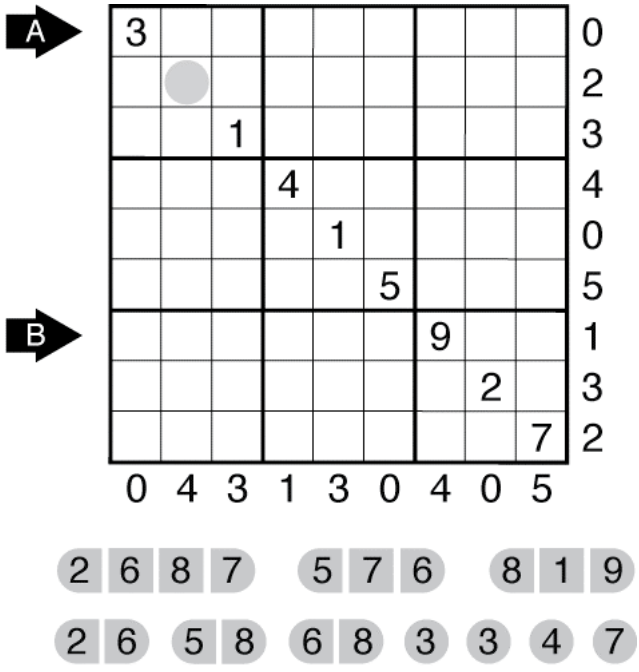
9. Almost Simple Loop – "Hybrid"
(20 point = 10x10 grid; 50 point = 12x12 grid)
Draw a single closed loop that passes through adjacent white cells and not through any gray cells. The loop cannot intersect or overlap with itself. Some white cells may not be a part of the loop, but no two unused white cells can share an edge. Some gray cells contain a number and arrow indicating the count of *unused* white cells in the direction of the arrow.



Answer Entry: For each marked row, enter the number of cells of the longest horizontally connected group of cells in that row, starting at the top and continuing to the bottom. If this number is 10 or greater, enter the units digit of the number. For the example, the answer is **642344.**



10. Battleship Sudoku – "Hybrid"
(20 point = 6x6 grid; 50 point = 9x9 grid)
Place the digits 1 through 6 (1 through 9 in the larger grid) into the empty cells in the grid (a single digit per cell) so that each digit appears exactly once in each of the rows, columns, and bold outlined regions. A fleet of ships must also be placed into the grid according to standard Battleship rules: no ships are adjacent (even diagonally) and the number of ship segments in a row/column is given by the digits outside the grid. Ships ***cannot*** be placed in any square with a given number, and some unlabelled ship segments or seas may already be given in the grid. Each ship segment in the fleet is numbered, and these numbers will be used to complete the Sudoku solution; the numbers on the ships can be entered in any orientation, allowing for rotation of the large ships.



Answer Entry: Enter the digits in the indicated rows marked by the arrows A and B from left to right. For the example, the answer is **359167284, 234758961**.