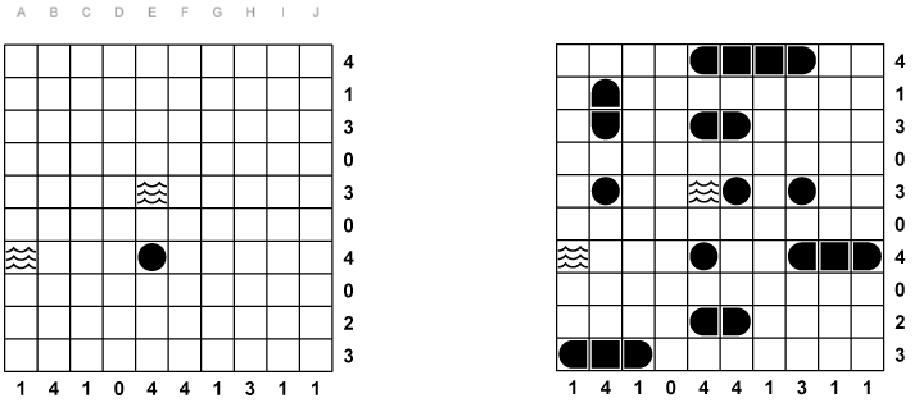
1. Water Hazard (Battleships – Moshe Rubin) - 5 points

Locate the position of the 10-ship fleet in the grid. Each segment of a ship occupies a single cell. Ships are oriented either horizontally or vertically, cannot cover water, and do not touch each other, not even diagonally. The numbers on the right and bottom edges of the grid reveal the total number of ship segments that appear in the corresponding row or column.

(For solving, ignore the letters at the top of the grid.)

Ex.



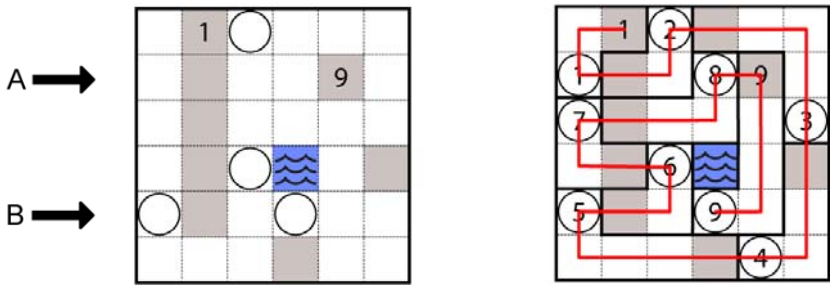
[diagram]

Answer: For each row, from top to bottom, enter the letter corresponding to the left-most column where a ship segment appears. Enter "X" for an empty row. (For the Example, the answer would be EBBXBXEXEA.)

2. Doglegs (Craig Kasper) - 5 points

Locate the path from the first tee to the 18th green, made of orthogonally connected cells and consisting of 18 consecutive holes. Each hole, numbered consecutively from 1 to 18, consists of 3-5 cells; the first is the "tee" and the last is the "green"; starting with the second hole, each tee is adjacent to the previous green. Each hole is a "dogleg", containing exactly one right-angle turn. All cells in the grid are used except for those indicated with water. Some tee locations are given, indicated by gray cells; some greens are given, indicated by circles; some tees and greens are indicated with the number of the hole to which it belongs.

Ex. (9 holes)



[diagram]

Answer: For the indicated rows (2nd, 5th, and 8th), enter the rightmost digit of the hole number for each cell, from left to right (ignoring unused cells). Separate each row by a comma or space. (For the Example, the answer would be 122893,566994.)

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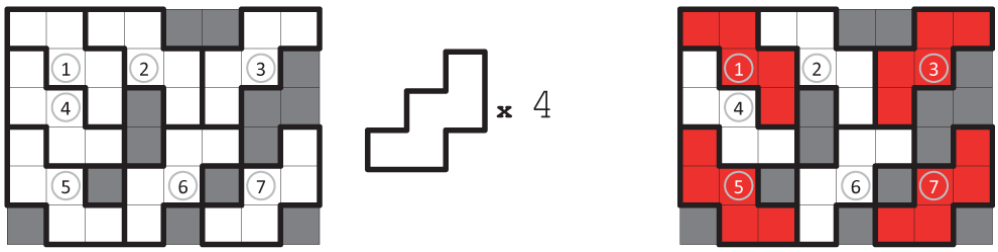
3. Course Management (Serkan Yürekli) - 5 points

Locate the number of given shapes in the grid so that the shapes do not touch each other, not even diagonally. (For solving, ignore the given numbers in the grid.)

Ex.



[diagram]

Answer: Enter numbers (in numerical order) for each shape used. (For the Example, the answer would be 1,3,5,7.)

---

4. Mouse Trap (Baxter/Merrill) – 1 point for each difference found; bonus: 5 points for finding all ten; penalty: -5 points if any difference is incorrect

Find the ten differences between the top picture and its reflection below.

The differences are clearly intentional, such as things that have disappeared, moved, changed size, shape, or orientation. Ignore the grid lines and subtle differences due to graphic anomalies or overall distortion. A grid square will contain at most one difference.

[diagram]
[diagram]

Answer: Enter the coordinates (such as "A1") for up to 10 differences found.

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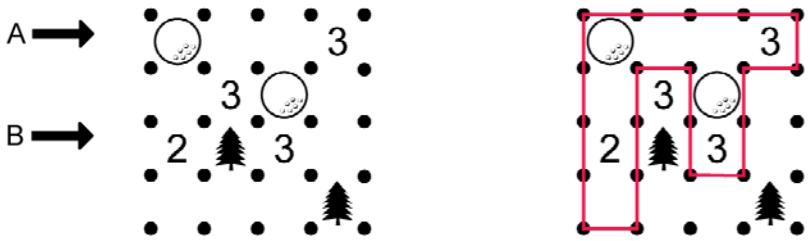
5. OB Fence (Wolves and Sheep in Fences – Dave Tuller) - 10 points

Draw a single closed loop by connecting neighboring dots horizontally or vertically (but not diagonally). A numbered square indicates exactly how many of its edge segments are used by the loop. A square containing a ball must end up inside the loop; a square containing a tree must end up outside the loop.

Ex.



[diagram]

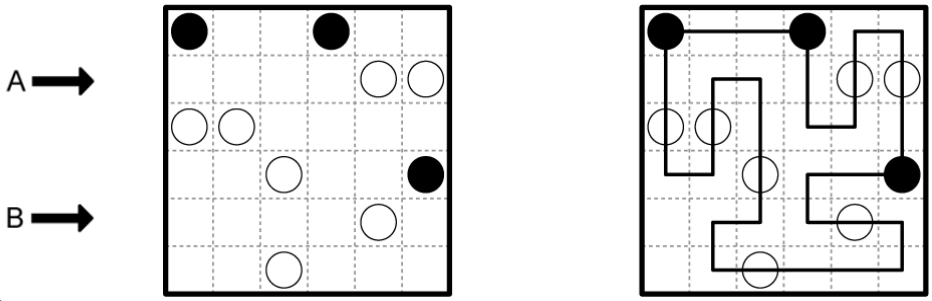
Answer: For the indicated rows (1st, 4th, 7th, and 10th), enter the number of cells in each contiguous segment of cells inside the loop, from left to right. Separate each row by a comma or space. (For the Example, the answer would be 4,11.)

---

6. Mashie (Masyu – Nikoli) - 10 points

Find a single closed loop passing through each of the black and white circles. The loop passes through the centers of adjacent squares. When passing through a black circle, the loop must make a 90 degree turn and extend at least two squares in both directions. When passing through a white circle, the loop must go straight and must make a 90 degree turn in at least one of the adjacent squares.

Ex.



[diagram]

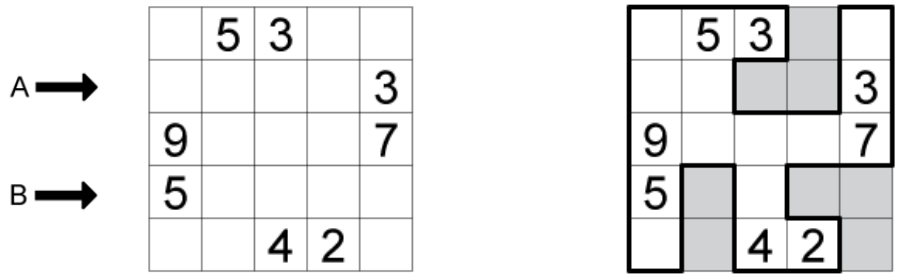
Answer: For the indicated rows (4th, 7th, 11th, and 16th), enter the lengths of the horizontal path line segments, from left to right. Separate each row by a comma or space. (For the Example, the answer would be 1,12.)

---

7. Bag (Nikoli) - 10 points

Draw a bag (single closed loop) along the grid lines so that all the numbered squares are inside the bag. Additionally, each number equals the count of *interior* squares that are directly in line (horizontally and vertically) with that number's square, including the square itself.

Ex.



[diagram]

Answer: For the indicated rows (3rd, 7th, and 9th), enter the widths of each group of cells *inside* the bag, from left to right. Separate each row by a comma or space. (For the Example, the answer would be 21,11.)

---

8. Scorecards (Richard Hess) - 5 points each;
bonus: 10 points for solving all three

For each of the three independent problems A-C, use each of the given digits (right of arrow) exactly once to create a mathematical expression resulting in the given value (left of arrow).

Operations are limited to addition ("+"), subtraction ("-"), multiplication ("x"), division ("/"), and exponentiation ("^"). Decimal points may be used; digits may be combined to form multi-digit values; use minus sign ("-") to indicate negative values. Use parentheses if needed to disambiguate operator precedence.

Ex. `11 ← 5,8,9` `8 + 9^.5 = 11`

A. **[diagram]**
B. **[diagram]**
C. **[diagram]**

Answer: For each of the three problems, enter the expression. (For the example, the answer would be 8+9^.5 or 9^.5+8.)

---

9. Front Nine (Sudoku – Nikoli) – 10 points

Place the digits 1 through 9 into the empty squares (one per square) 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.

A →
B →

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

Ex.

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

[diagram]

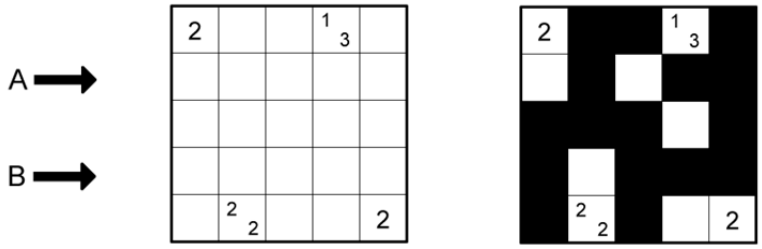
Answer: For the indicated rows (1st and 6th), enter the digits from left to right. Separate each row by a comma or space. (For the Example, the answer would be 982351467,421768593.)

---

10. Cart Path (Tapa – Serkan Yürekli) - 15 points

Paint some empty squares black to make a single network of paths, connecting squares vertically or horizontally, but never covering a 2x2 region. A square containing one or more numbers indicates the sizes of all groups of consecutively adjacent black squares, where multiple groups are separated by at least one white square and in no particular order.

Ex.



[diagram]

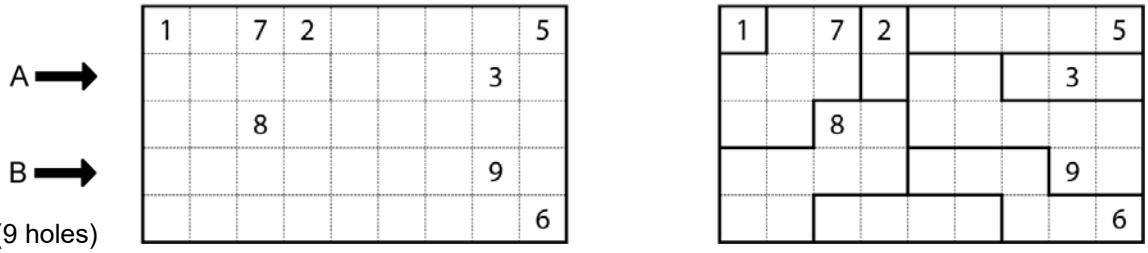
Answer: For the indicated rows (2nd, 4th, and 6th), enter the widths of each group of black squares, from left to right. Separate each row by a comma or space. (For the Example, the answer would be 12,13.)

---

11. Drop Area (John Bulten) – 20 points

Divide the grid into 18 "holes" (regions), numbered 1 through 18, each with rotational symmetry, and with area equal to the hole number. Some cells contain a flag number, which is equal to the number of the hole that contains it. (Note that not all regions will contain a flagged cell.)

Ex. (9 holes)



[diagram]

Answer: For the indicated rows (2nd, 10th, and 18th), enter the hole number corresponding to each cell from left to right (enter only the rightmost digit for two-digit holes). Separate each row by a comma or space. (For the Example, the answer would be 777299333,888866699.)

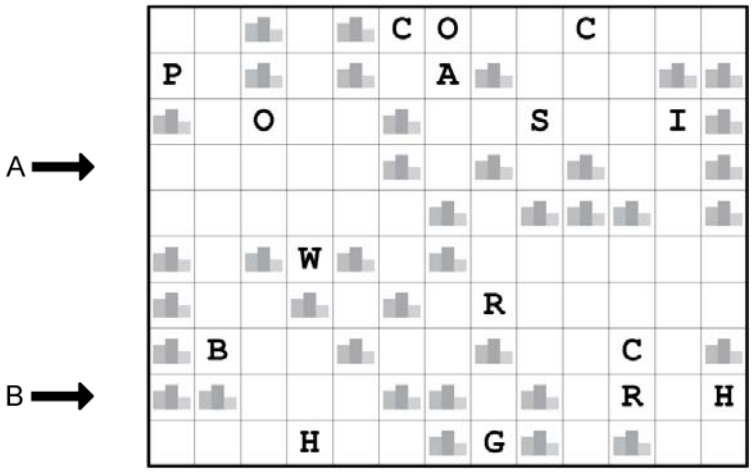
---

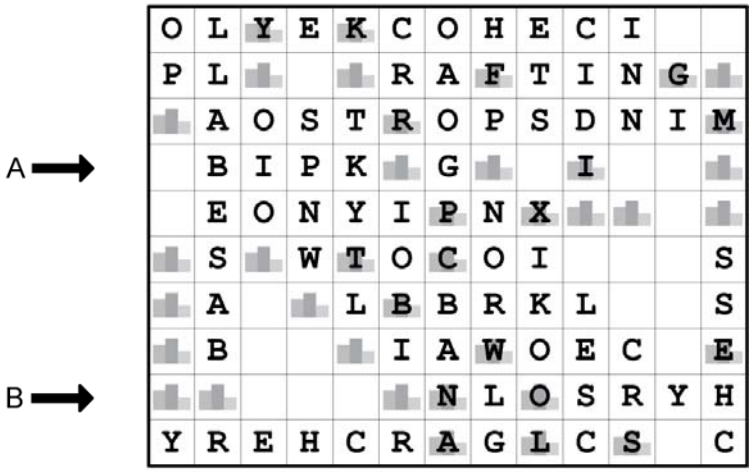
12. Touring Pros (Serkan Yürekli) - 20 points

Enter the given names into the grid (ignoring spaces). Names must appear straight in any of eight directions (orthogonal or diagonal), and may overlap with other names. All letters given in the grid must be used. All letters placed in any of the marked cells must be different from each other (note that not all marked cells will be filled).

Ex.

ARCHERY	COWBOY POLO	PAINTBALL
BASEBALL	CYCLING	POKER
BOWLING	ICE HOCKEY	RAFTING
BOXING	MIND SPORTS	SKI CROSS
CHESS		





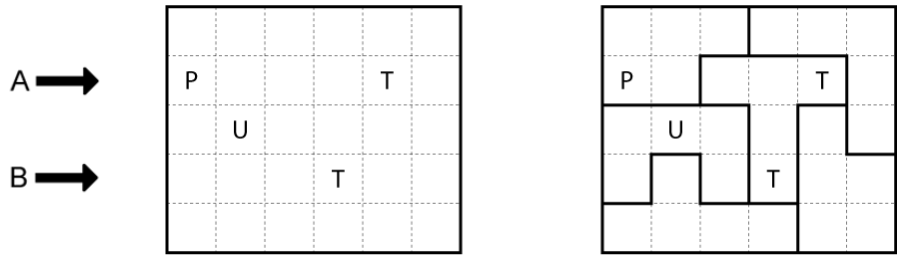
[diagram]
[word list]

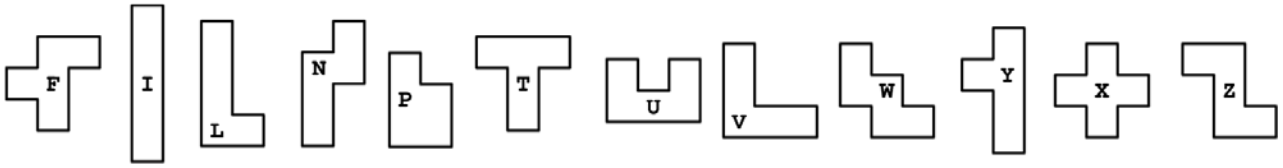
Answer: For the indicated rows (2nd, 9th, and 17th), enter the letters, from left to right. Separate each row by a comma or space. (For the Example on the previous page, the answer would be BIPKGI,NLOSRYH.)

13. 18 Tees (Pentominous – Carl Worth) - 20 points

Divide the grid into pentominoes (five-cell regions) so that no two pentominoes of the same shape share an edge (rotations and reflections are considered the same shape). A cell containing a given letter must be part of a pentomino shape associated with that letter. An inventory of pentominoes is given below, but not all shapes are necessarily used.

Ex.





[diagram]

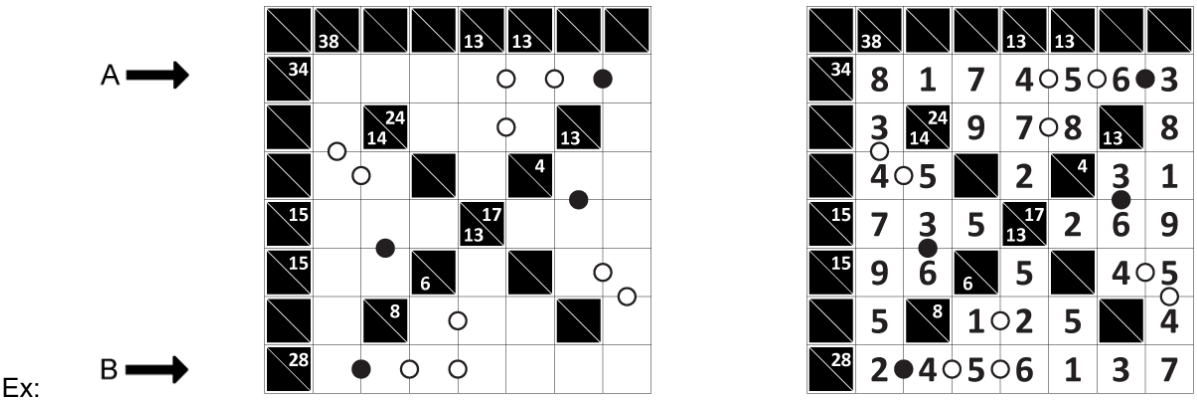
Answer: For the indicated rows (2nd, 6th, and 11th), enter letters corresponding to the pentomino shape for each cell, from left to right. Separate each row by a comma or space. (For the Example, the answer would be PPTTTV,UYUTPP.)

---

14. Pin Placement (Kropki Kakuro – Serkan Yürekli) – 20 points

Enter a single digit from 1 to 9 into each empty square so that the sum of the digits in each across and down answer equals the clue value given to the left or above, respectively. No digit is repeated within a single answer. Additionally, all adjacent pairs of consecutive digits are indicated by a white circle, and all adjacent pairs of digits with a ratio of 2 are indicated by a black circle (a circle between 1 and 2 can be either white or black).

Ex:



[diagram]

Answer: For the indicated rows (1st, 5th, and 8th), enter the digits from left to right. Separate each row by a comma or space. (For the Example, the answer would be 8174563,2456137.)

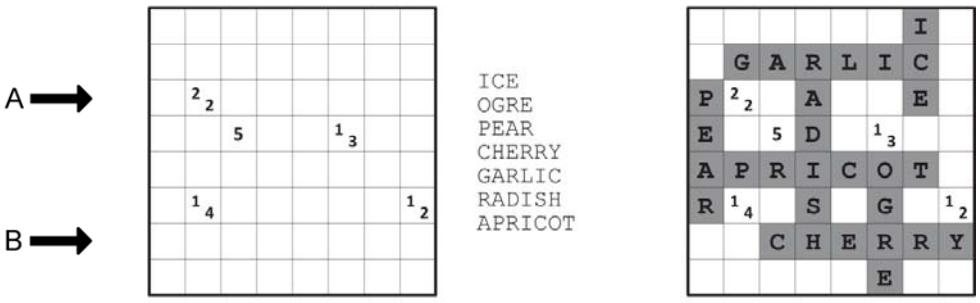
---

15. Scramble (Tapa Scrabble – Serkan Yürekli) - 25 points

Paint some empty squares to make a single network of paths, connecting squares vertically or horizontally, but never covering a 2x2 region. A square containing one or more given numbers indicates the sizes of all groups of consecutively adjacent black squares, where multiple groups are separated by at least one white square and in no particular order.

Additionally, the given word list will completely fill the paths in crisscross style, either across or down, one letter per square, with no extra words appearing that are not in the given list. Ignore any spaces in the word list.

Ex.



[diagram]
[word list]

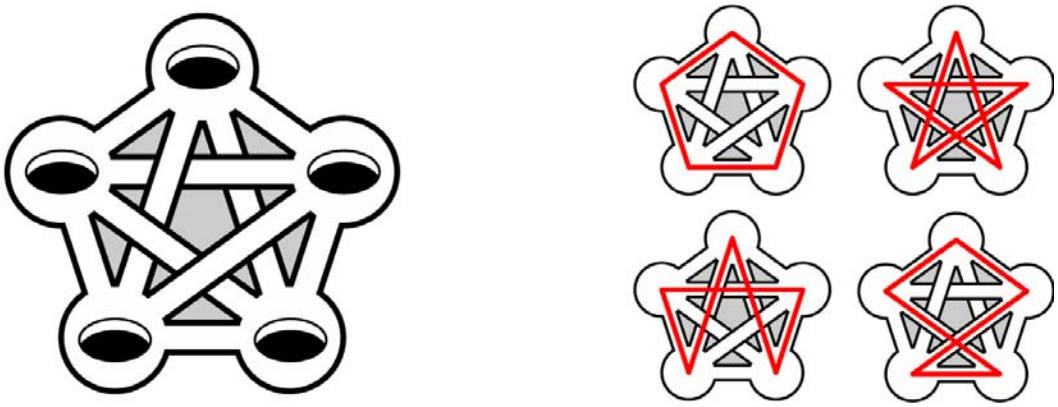
Answer: For the indicated rows (3rd, 7th, and 11th), enter the letters, from left to right. Separate each row by a comma or space. (For the Example, the answer would be PAE,CHERRY)

---

16. Round of Golf (Serhiy Grabarchuk) – 25 points;
penalty: -5 points if incorrect count is off by 2 or more

Count the number of differently shaped closed loops (ignoring rotations, reflections, and the layering of overpasses) that connect each of the 18 holes exactly once, traveling only along the given connecting paths.

Ex. (5 holes):



[diagram]

Answer: Enter the number of differently shaped paths. (For the Example, the answer would be 4.)

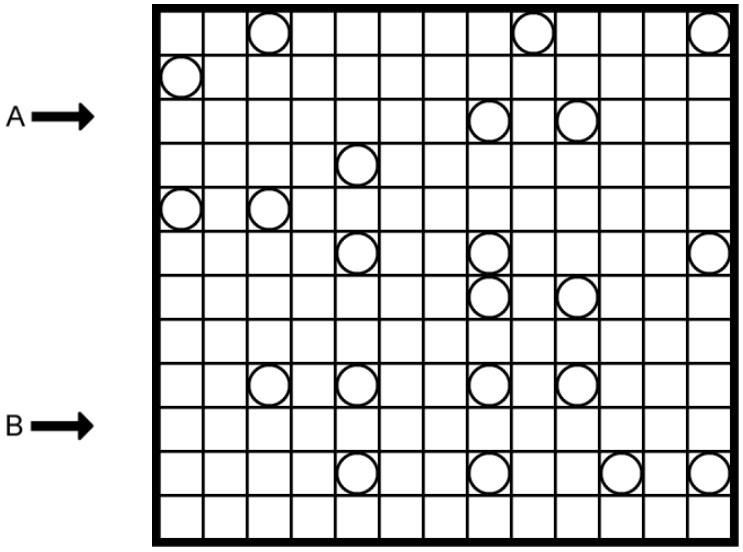
---

17. US Open (Craig Kasper) - 30 points

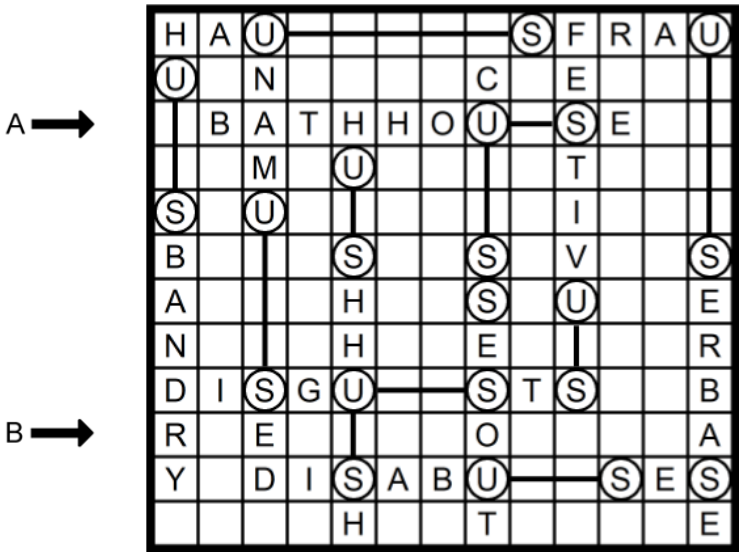
Enter the given words (ignoring given spaces and punctuation) into the grid, across or down, one letter per cell. The given circles indicate exactly all instances of the letters "U" and "S". When a given word contains the bigram "US" (in that order), you must open a gap of one or more spaces between the "U" and "S" before entering the word into the grid. Such spaces are considered part of the entered word, and must remain as spaces in the final grid (and may cross other similar gaps).

No words are formed that are not in the word list. All entries (which includes all of the inserted spaces) are interconnected.

Ex.



BATHHOUSE
CUSSES OUT
DISABUSES
DISGUSTS
FESTIVUS
HAUSFRAU
HUSBANDRY
HUSH-HUSH
UNAMUSED
USER BASE



[diagram]
[word list]

Answer: For the indicated columns (4th, 9th, 17th, 23rd), enter the letters, from top to bottom. Separate each column by a comma or space. (For the Example, the answer would be BATHHOUSE,REOA.)

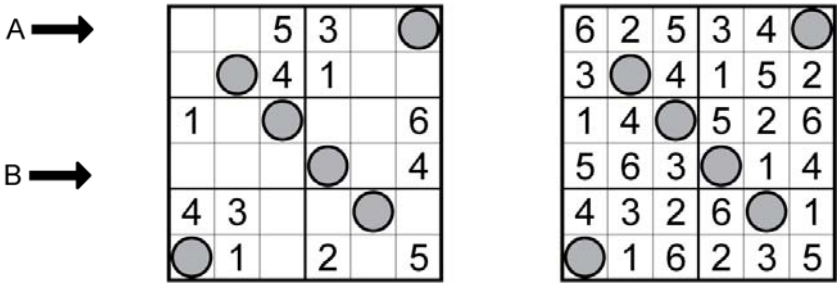
18. Gopher Hole Sudoku (Adam R. Woods) – 30 points

Place the digits 1 through 9 into the empty squares (one per square) so that each digit *except one* appears exactly once in each of the following regions: the nine rows, the nine columns, and the nine outlined 3x3 regions.

Additionally, each digit from 1 through 9 is missing from exactly one row, one column, and one 3x3 region.

The gopher holes do not contain any digits. For each gopher hole, the digits missing from the corresponding row, column, and 3x3 region are all distinct.

Ex.



[diagram]

Answer: For the indicated rows (1st and 7th), enter the digits from left to right. Separate each row by a comma or space. (For the Example, the answer would be 62534,56314.)

END OF TEST