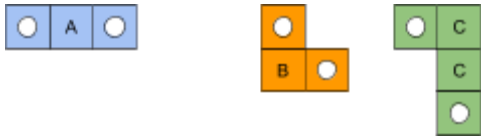
AMERICAN COMPUTER SCIENCE LEAGUE

2018-2019 **Contest #3**

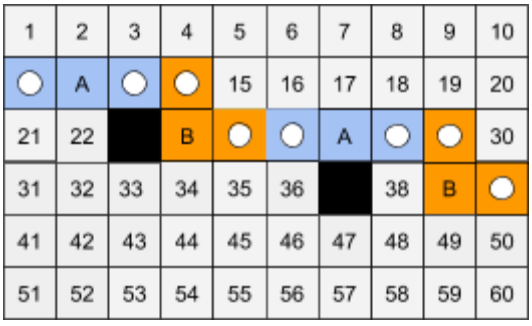
Junior Division - Stretch

PROBLEM: Given a rectangular grid and the 3 types of pieces shown below, the object of Stretch is to place pieces in the grid so that they form a connected path from the left side to the right side.



- A piece cannot be rotated or flipped.
- A piece can only connect to the last piece that was placed and one column to the right of that piece.
- A piece can connect only at a tile with a circle and the tiles with the circles are the only tiles that are allowed to touch.
- All tiles of the connecting piece must be to the right of all previously placed pieces.
- A piece cannot be placed in the grid such that it would cover any part of another piece, cover a blocked cell, or extend beyond the grid.
- The one and only tile allowed to touch the starting side is a circle tile.
- The one and only tile allowed to touch the opposite side is a circle tile.
- Pieces are placed in alphabetical order. If a piece does not fit, skip it and use the next piece that fits. When Piece C is either used or skipped, then begin again with Piece A.
- Grid cells are numbered consecutively starting with 1 in the upper left corner as shown.
- We guarantee that if a piece can be placed, then that will be the only location it can be placed.

EXAMPLE: The following example is a 6 x 10 grid with a starting cell of 11. There are blocked cells at cells 23 and 37. Piece A is placed at 11. Piece B can only be placed at 14. The next piece must connect at 26. Piece C cannot be placed at 26 because there is a blocked cell at 37. Therefore, Piece C is skipped. Piece A is placed at Location 26. The next piece must connect at 29. Piece B is placed at 29 and touches the right side at 40. Therefore, the path is ABAB.



INPUT: There will be 5 lines of data. Each line will contain the numbers: r, c, s, n, followed by n numbers. r indicates the number of rows in the grid. c indicates the number of columns in the grid. s indicates the starting cell number for the first piece. n indicates the number of blocked cells, and the next n numbers are the cells that are designated as blocked.

OUTPUT: Form a path from the starting cell on the left side of the grid to a single cell on the opposite edge of the grid using the algorithm above. Print the sequence of pieces that were used to form the path.

SAMPLE INPUT **http://www.datafiles.acsl.org/2019/contest3/jr-sample-input.txt**

```
6 10 11 1 37
4 9 1 1 16
4 10 1 0
6 11 1 1 42
4 8 17 1 21
```

SAMPLE OUTPUT

1. ABAB
2. ABBB
3. ABCA
4. ABCBB
5. ABA