The game is played by two to four players on a square board with a 15-by-15 grid of cells (individually known as ‘squares’) and 100 tiles. Each of the squares contains a single letter tile. The words are formed across and down in unbroken rows.

The game contains 100 tiles, 98 of which are marked with a letter and a point value ranging from 1 to 10. The other two tiles are blank and carry no point value.

A proper play uses one or more of the player’s tiles to form a contiguous string of letters that make a word (the ‘main word’) on the board, reading either left-to-right or top-to-bottom. The main word must either use the letters of one or more previously played words or else have at least one of its letters horizontally or vertically adjacent to an already played word. Words other than the main word are formed by the play; they are scored as well, and are subject to the same criteria of acceptability. Any contiguous string of letters on the board will always have to be a valid word.

When the board is blank, the first word played must cover the center square (8th row and 8th column). The word must consist of at least two letters, extending horizontally or vertically. A blank tile may take the place of any letter. It then remains that letter for the rest of the game.

The words are formed across and down in unbroken rows.

Game Description:

The problem is to find the optimal word to place on a partially completed Scrabble game. A proper play uses one or more of the player’s tiles to form a contiguous string of letters that make a word (the ‘main word’) on the board, reading either left-to-right or top-to-bottom. The main word must use the letters of one or more previously played words or else have at least one of its letters horizontally or vertically adjacent to an already played word. Words other than the main word are formed by the play; they are scored as well, and are subject to the same criteria of acceptability. Any contiguous string of letters on the board will always have to be a valid word.

Sample Input

1 23
 akache ranch
activated
award
chocoholic
discouraged
flexible
nims
torpedo
torpedo

Output

Case 1: 12
Case 2: 4
Case 3: 6
Case 4: 8
Case 5: 6

Sample Output

Case 1: 12
Case 2: 4
Case 3: 6
Case 4: 8
Case 5: 6