

DEVELOPER

Introduction

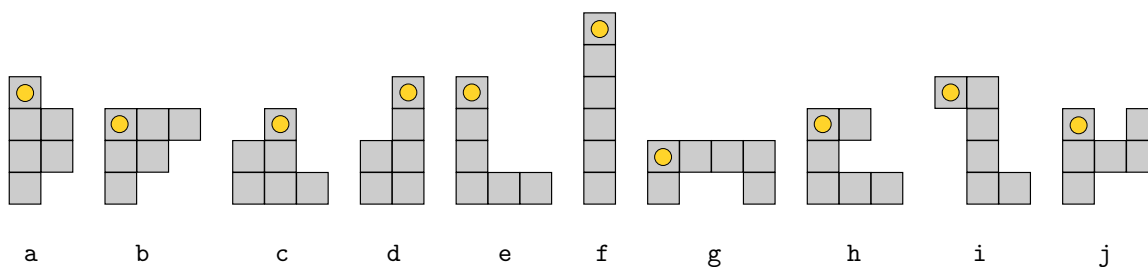
One of the most recently seized planets occupied by beetlejumpers has very friendly living conditions for these creatures. Construction of modern residential estates for war veterans on its surface may significantly improve morale of the team conquering the farthest corners of Universum.

Your team must success as a construction developer. At your disposal you will have plots of land (each being a grid $N \times M$ of fields) to construct houses with gardens. Each plot of land may include inaccessible fields which cannot be used as well as trees which may influence the final value of the investment. The plot of land must be developed in the best possible way while observing the applicable provisions of law.

Construction of households

Local construction provisions clearly regulate the possible shape and arrangement of households:

- each house must have its own garden,
- each house adjoins its garden (such neighborhood means that at least one side of the grid is joint),
- the area of each house and each garden is the same and it equals 6 fields (one household is 12 fields large: 6 fields for a house and 6 fields for a garden),
- surfaces of the houses and gardens are separate (they cannot overlap each other),
- surfaces of the houses and gardens cannot include inaccessible fields,
- each house and each garden must be of a feasible shape – ten possible shapes are presented below (only translations and rotations are admissible):



Real estate evaluation

Differences between particular ways of land development are extremely important for future residents. Beetlejumpers wish to enjoy the natural richness of the planet. At the same time, they prize their privacy, thus the value of each constructed household is calculated as follows:

- for the construction of a house together with the garden: +3,
- for each cut down tree for the purposes of the construction of a house: -2,
- for each tree left in the garden: +2,
- for each joint wall of the house with another house: -1.

The total investment value S of a given plot of land ($N \times M$ fields) is the sum of all household investment values constructed on its surface.

Problem

Plan the construction of the houses on the plot in accordance with the provisions so that the total investment value S is as high as possible.

Input data

Test data are given in `dev*.in` files.

The first line of a test set includes T – the number of plots, which may be used for the construction of houses with gardens. The next lines include T descriptions of the plots. In the first line of the description there are two integer numbers representing the length M and the width N of a plot. The following M lines includes a detailed plan of the plot. Each of them holds N characters describing the fields of the plot: character 'X' stands for a tree, character '#' stands for an inaccessible fields, and character '.' stands for an empty field assigned for construction.

$$1 \leq T \leq 10$$

$$5 \leq M, N \leq 200$$

Output data

Output data should include a description of buildings of particular plots in the order in which they appeared in the input file. Each single description of buildings located in the plot is composed of the same elements listed below.

In the first line of the description a integer number P should be given, being a number of houses with gardens constructed in the plot and the number S being the investment value on this plot. The next P lines describe the location of subsequent houses and gardens. Each of these lines should include eight values: first four of them constitute a description of the location of a house, the next four – the corresponding garden. Within the framework of each four values t , r , x and y :

- t – stands for the ID of the selected shape (from a to j),
- r – stands for rotation (from 0 to 3) – the number of 90° turns to the right around the anchor (annotated with a yellow circle in one of the fields of every shape),
- x – stands for a horizontal coordinate (from 1 to N , counted from the left to the right) of the anchor,
- y – stands for a vertical coordinate (from 1 to M , counted from the top to the bottom) of the anchor.

Example

For the input data:

```
1
6 9
X....X.X
..X..X.X.
..X.X..XX
...X.X..#
XX....X.
.X.XX...#
```

A possible answer is:

```
4 20
a 0 1 2 b 1 3 1
g 0 4 1 c 1 7 3
c 0 4 3 f 1 6 6
a 1 9 5 d 2 8 4
```

Explaining the example

Total investment value:

- for constructed houses: $4 \cdot 3 = 12$
- for cut down trees: $4 \cdot (-2) = -8$
- for trees in the gardens: $11 \cdot 2 = 22$
- for joint walls: $(-1) + (-1) + 3 \cdot (-1) + (-1) = -6$

$$12 - 8 + 22 - 6 = 20$$

X						X		X
		X			X		X	
		X		X			X	X
			X		X			#
X	X						X	
	X		X	X				#

Score

If all requirements listed below are met:

- output data are correctly formatted,
- construction of all households is in accordance with the provisions,
- there is at least one household on each plot of land,
- value S is properly calculated for each plot of land,

then the score for each set equals to $\max(S_s, 1)$, where S_s is the sum of all S values concerning construction plots in a given file. Otherwise the score is 0.