Lefkaritika

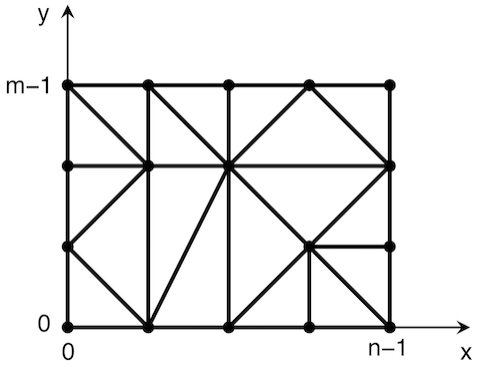
Marikkou is spending her afternoon with her grandmother, who is teaching her how to sew "lefkaritika" - a traditional type of Cypriot lace made in Lefkara. These laces are made by tying tiny knots and joining them with threads to form delicate designs. More formally, for a Lefkaritiko of size $n \times m$:

- Knots are points on the Cartesian grid with integer coordinates, with $0 \leq x \leq n-1$ and $0 \leq y \leq m-1$
- Threads are line segments between two knots

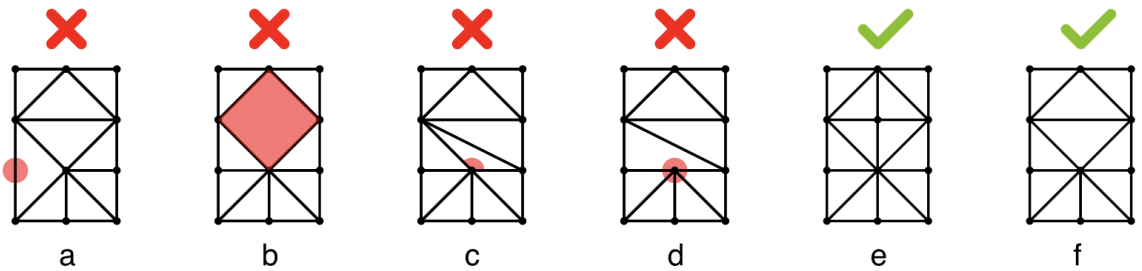
Specifically, Marikkou is fascinated from Lefkaritika when the following are true:

- The Lefkaritiko has n and m *border* knots along its length and width respectively, at each coordinate with one of the following being true: $x = 0$, $x = n-1$, $y = 0$, or $y = m-1$
- The threads may only form triangles
- All the triangles must have angles less than or equal to 90 degrees
- A knot that serves as a corner of one triangle cannot lie along the side of another triangle
- Non-border knots may only be placed at points with integer coordinates, and lie within the frame, i.e. with $x \in [1, n-2]$ and $y \in [1, m-2]$.
- Threads cannot intersect

Example of lefkaritiko for $n = 5$ and $m = 4$:



Here are some examples of correct and incorrect lefkaritika:



a. incorrect, the knot on the frame is not used.
b. incorrect, the part is not a triangle.
c. incorrect, the angle is greater than 90 degrees.
d. incorrect, the knot is on a side of another triangle.
e. correct, 12 triangles.
f. correct, 10 triangles.

Marikkou believes that the fewer triangles she uses, the more elegant the lefkaritiko becomes. She wonders what pattern will give her the smallest number of triangles while still meeting all the constraints above. Can you help her sew the perfect lefkaritiko?

This is an output-only task. Download the 20 input files (`01.txt`, `02.txt`, up to `20.txt`) containing the inputs from the contest system, solve the task, and submit the output as separate files. You can either submit individual files on CMS, or a zip file called `submission.zip` containing files `output_01.txt`, `output_02.txt`, etc.

Input format

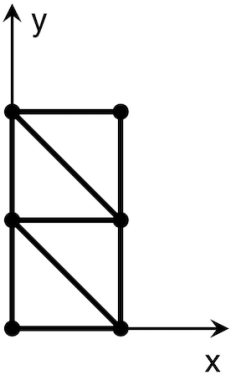
The single line of the input contains two integers n and m, the width and the height of the frame.

Output format

In the first line output integer t, the number of threads used. In the next t lines output 4 integers x_1, y_1, x_2, y_2, the coordinates of two knots connected with a thread.

You should output all threads, including ones on the border of the frame.

Example

Input	Output	Visualisation
2 3	9 0 0 0 1 0 1 0 2 1 0 1 1 1 1 1 2 0 0 1 0 0 2 1 2 0 1 1 0 0 1 1 1 0 2 1 1	

Scoring

Your score for the task will be the sum of your score on each of the 20 testcases `01.txt` through `20.txt`. Each testcase is worth up to 5 points.

If your answer for the test is incorrect, you will get 0 points. If it is correct, then your score S for this test will be calculated using the following formula:

$$S = 5 \cdot \left(0.05 + 0.95 \cdot \min\left(\frac{T_{opt}}{T}, 1\right)\right)$$

Here T is the number of triangles in your solution, and T_{opt} is the number of triangles in the best solution found by the judges.

Constraints

In all testcases, the values of n and m are between 2 and 100. Specifically, for ease of reference, the values of n and m for each testcase are:

Test	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
n	2	2	3	2	3	5	9	20	43	50	100	99	92	98	98	100	100	96	97	93	91
m	3	2	3	100	100	6	11	20	37	50	100	94	100	95	100	90	93	96	96	99	98

Visualizer

To help you debug your solution, you can use a web-based visualizer available at:

https://lefkaritika.jboi.cmscoinformatics.org

Here, you can paste your output for any of the testcases (or a custom testcase), and after clicking `Check solution` you will be presented with the following information:

- Whether your solution is valid (i.e. follows all constraints from above)
- The number of triangles, threads and knots used
- A plot of all the threads, triangles on a coordinate grid
- In the cases where your solution is invalid, you will be presented with a list of errors causing your solution to be invalid, and corresponding threads will be plotted in red

If the web visualizer ever disagrees with the checker on CMS, the checker on CMS takes precedence (e.g. if web visualizer says that your solution is valid, but CMS says it's invalid). If that happens, you should let us know so we can investigate.