

19CSE102 Computer Programming

Practice 1: Golden Plate

Problem 1031A-1

You have a rectangular plate, and you want to add some gilding to it along the bordering cells so that it forms a golden ring. The plate is a rectangle that we split into $w \times h$ cells. Your task is to compute the number of cells gilded.

Input

Two integers w, h such that $1 \leq w, h \leq 1000$, the number of rows and columns.

Output

Print the number of cells gilded.

Example

Input

3 3

Output

8

Input

7 9

Output

28

Note

The examples are described below.

First example: 3 x 3 rectangle - 8 cells gilded

Second example: 7 x 9 rectangle - 28 cells gilded

Answer the following questions.

- 1. Describe your solution approach.**
- 2. What would be your implementation considerations (if any)?**

3. Provide your implementation.

Note: You need to implement your computation logic in a separate function **`gild_ring`**. Do not implement the entire program in main. It will attract negative marks.

4. List the test cases.

Problem 1031A-2

A modified version of the problem is to draw 2 golden rings in such a way that the first one goes along the edge of the plate and the second one 2 cells way from the edge (i.e., they do not touch each other). You must compute the number of cells gilded.

Input

Two integers w, h such that $1 \leq w, h \leq 1000$, the number of rows and columns.

Output

Print the number of cells gilded.

Example

Input

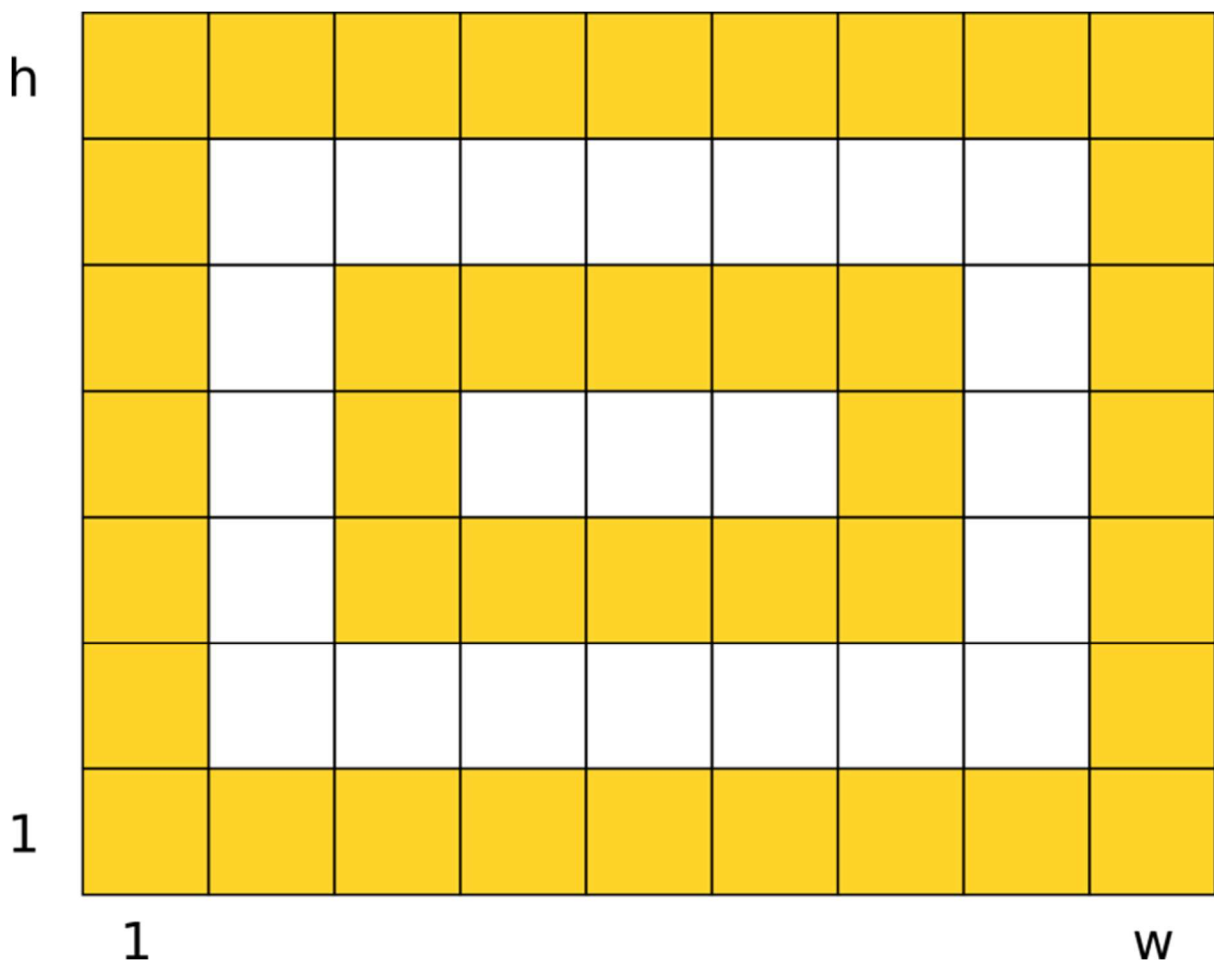
7 9

Output

40

Note

The example is described below.



7 x 9 rectangle - 28 + 12 cells gilded

Answer the following questions.

1. How would you modify your previous solution?

2. Provide your modified implementation.

Note: You need to reuse the function **gild_ring** (that you have already defined) for the computation of second ring.

3. Add more test cases to the list.

Problem 1031A-3

A further modification of the problem is to draw k golden rings in such a way that the first one goes along the edge of the plate and the second one goes 2 cells way from the edge, the third one goes 2 cells away from the second one, so on and so forth. You must compute the number of cells gilded.

Input

Three integers w, h, k such that $1 \leq w, h \leq 1000$, $1 \leq k \leq \lfloor (\min(w, h) + 1) / 4 \rfloor$, the number of rows and columns and the number of gilded rings.

Output

Print the number of cells gilded.

Example

Input

3 3 1

Output

8

Input

7 9 1

Output

28

Input

7 9 2

Output

40

Answer the following questions.

1. How would you modify your previous solution?

2. Provide your modified implementation.

Note: You need to reuse the function **gild_ring** for the computation of k rings.

3. Improvise your test cases.

Submission

1. Check out the problem **1031A Golden Plate** in <https://codeforces.com/problemset/problem/1031/A>
2. After checking your solution thoroughly, submit your program and get an **Accepted** message.