



**JUNIOR CROATIAN OLYMPIAD IN INFORMATICS 2012**  
**SECOND EXAM**  
**Krk, 28th June 2012**  
**Task overview**

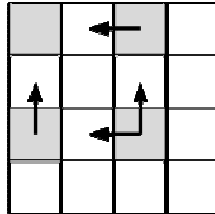
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<b>TASK</b>	<b>POSAO</b>	<b>TEGLE</b>	<b>TRATINČICE</b>
<b>input data</b>	standard input		
<b>output data</b>	standard output		
<b>time limit</b>	1 sec	1 sec	1 sec
<b>memory limit</b>	32 MB	32 MB	32 MB
<b>points</b>	<b>100</b>	<b>100</b>	<b>100</b>
	<b>300</b>		



Little Domagoj has his hands full of work. His jobs are organized in  $N \times N$  matrix in such a way that each cell represents one job. He can start doing job at cell  $(x, y)$  if and only if jobs at cells  $(x, y-1)$  and  $(x-1, y)$  are done (if they exist).



On the picture the required jobs are shown for gray cells.

Domagoj has  $K$  computers which he will use for doing jobs. One computer is able to do at most one job in one second. Also, all computers need not be used all the time. Help Domagoj and organize order in which computers will do jobs **in least possible time**.

### INPUT DATA

In the first line there are two integers  $N$  and  $K$  ( $1 \leq N, K \leq 10^9$ ), dimensions of matrix and number of computers.

### OUTPUT DATA

Print least possible time in which all jobs can be done.

### SCORING

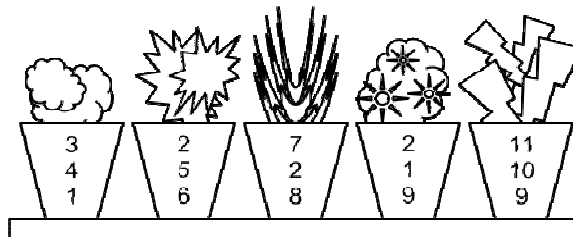
In test cases worth 72% of total points the following will hold -  $N$  and  $K$  will be at most 1000.

### TEST EXAMPLES

<b>input</b> 3 2	<b>input</b> 5 1	<b>input</b> 4 4
<b>output</b> 6	<b>output</b> 25	<b>output</b> 7



Martin is a beastly kid, who likes destroying his mother's flower pots. His mother owns **N** flower pots set up in a line and each pot has three integers written on it. When Martin crashes one of those pots, every pot **right of that pot** and shares at least one number with it also falls. Moreover, this rule is applied recursively, thus can result in crashing of whole lotta pots from just one direct pot crash from Martin. Beastly kids are known to be lazy and so is Martin, and he wants to know the **minimal number of pots** he has to crash directly so that all pots end up destroyed.



On the picture above the second sample is shown. If Domagoj crashes pot 2, it will also crash pot 3 and pot 4 because of number 2 and additionally pot 5 because of number 9 (found on pot 4). He needs to crash pot 1, which will cause the crashing of pot 3. This amounts to two direct crashes from Martin and is the solution to the sample.

### INPUT DATA

First line contains one integer **N** ( $1 \leq N \leq 300\,000$ ).

Each of the following **N** lines contains three integer **A<sub>i</sub>**, **B<sub>i</sub>**, **C<sub>i</sub>** ( $1 \leq A_i, B_i, C_i \leq 1\,000\,000$ ), three numbers written on the *i*-th pot from the left.

### OUTPUT DATA

In the first and only line write the minimal number of pots Martin has to crash himself to crash all the pots.

### SCORING

In test cases worth 48% of total points, **N** will be at most 1000.

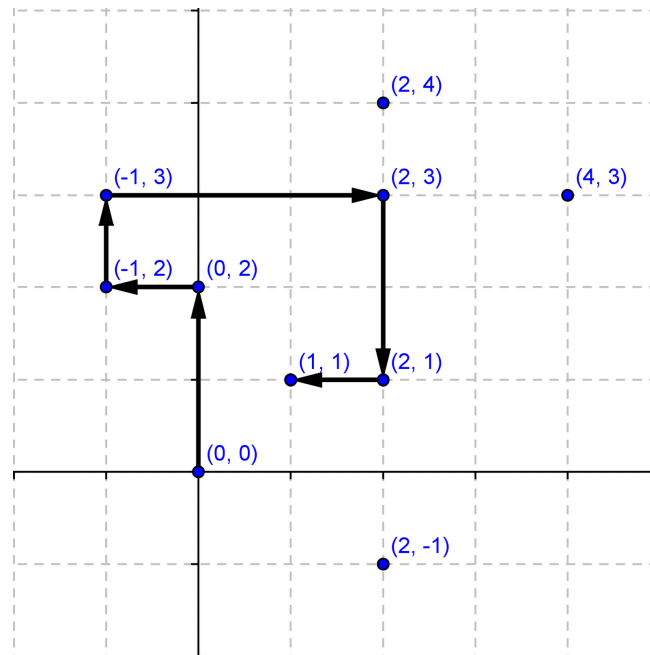
### TEST EXAMPLES

<b>input</b> 3 1 2 3 2 3 4 4 5 6 <b>output</b> 1	<b>input</b> 5 3 4 1 2 5 6 7 2 8 2 1 9 11 10 9 <b>output</b> 2
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As Mirko was carelessly picking clovers, he was possessed by aliens and he was now under their control. The field is a Cartesian coordinate system containing  $N$  points representing clovers.

His parents found out he was possessed and they managed to get info on how aliens control him. The aliens first place him at point  $(0, 0)$ , and then perform  $M$  steps where in each step they pick a direction (up, down, left or right) and send him from his current location to the next clover in that direction.



*on this picture is third test example*

For given field of clovers and descriptions of  $M$  steps, help Mirko's parents determine where will he end up after the aliens finish their control.

### INPUT DATA

First line contains two integers  $N$  and  $M$  ( $3 \leq N \leq 100\,000$ ,  $1 \leq M \leq 100\,000$ ), the number of clovers and the number of steps.

Each of the following  $N$  lines contains two integers  $X_i$  and  $Y_i$  ( $-100\,000 < X_i, Y_i < 100\,000$ ), coordinates of the  $i$ -th clover. These points will be mutually distinct.

Last line contains a sequence of  $M$  characters, where the  $i$ -th character represents the direction in the  $i$ -th step. L stands for left, R for right, U for up and D for down. Steps are carried out as from left to right and there will always be a clover in a given direction.

### OUTPUT DATA

In one and only line output the coordinates  $(x, y)$  which represent Mirko's location after those  $M$  steps.



## SCORING

In test cases worth 56% of total points, **N** and **M** will be less than 3000.

## TEST EXAMPLES

<b>input</b> 4 4 1 1 1 0 0 1 0 0 RULD <b>output</b> 0 0	<b>input</b> 7 5 0 0 0 1 0 -1 1 0 1 -1 3 0 3 -1 DRRUD <b>output</b> 3 -1	<b>input</b> 10 6 0 0 1 1 2 1 0 2 -1 2 -1 3 2 3 2 4 4 3 2 -1 ULURDL <b>output</b> 1 1
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