Problem I. LaLa and Spirit Summoning

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	1024 megabytes

LaLa's younger sister LiLi is helping LaLa cast the spirit summoning magic.

While LaLa was asleep, LiLi had already built a prototype of the spirit to summon. The spirit consists of N magic joints which allow any magic bars attached to them to freely move around them, and M magic bars of various colors, each of which connects two magic joints and whose length can be adjusted to any non-negative real number before the summoning (but not after).

When it comes to spirit summoning, LaLa has a far higher standard than LiLi. Of course, LaLa was not satisfied with LiLi's work whatsoever. LaLa would like to fabulize the prototype by getting rid of some magic bars so that

1. the spirit is **beautiful**, which means there should not be two magic bars of the same color present, and
2. the spirit is as easy to control as possible, which means the **degree of freedom** of the spirit must be minimum over all beautiful spirits obtainable by eliminating some magic bars. Note that the minimum always exists as she can always eliminate all magic bars to create a beautiful spirit. See the note below for the exact definition of the degree of freedom.

Write a program that computes the degree of freedom of the spirit fabulized by LaLa.

Input

The input describes the prototype spirit made by LiLi and is given in the following format:

$$\begin{array}{lll} N & M & \\ u_0 & v_0 & c_0 \\ u_1 & v_1 & c_1 \\ & \vdots & \\ u_{M-1} & v_{M-1} & c_{M-1} \end{array}$$

where N is the number of magic joints, numbered from 0 to $N-1$, M is the number of magic bars, and for each integer $0 \le i < M$, the i-th magic bar has color c_i and connects the magic joint u_i and v_i.

The input satisfies the following constraints:

- All the numbers in the input are integers.
- $2 \le N \le 200$
- $0 \le M \le 1\,000$
- $0 \le u_i < v_i < N$ and $0 \le c_i < M$ for all integers $0 \le i < M$

Note that there can be multiple magic bars connecting the same pair of magic joints.

Output

The output should be a single integer equal to the degree of freedom of the spirit fabulized by LaLa.

Examples

standard input	standard output
3 3 0 1 0 0 2 0 1 2 0	5
3 3 0 1 0 0 2 1 1 2 2	3
4 4 0 1 0 1 2 1 2 3 2 0 3 3	4
5 4 0 1 0 1 2 1 2 3 2 3 4 3	6

Note

Intuitively, the degree of freedom is the number of axis of motions preserving edge lengths of the spirit embedded on a plane.

More formally, let E be an assignment of planar coordinates (we'll call this an **embedding**) to all magic joints of a spirit. Note that such an embedding can be identified with an element in $\mathbb{R}^{2N}$ by concatenating all coordinates, where N is the number of magic joints.

Let $C(E)$ be the set of embeddings continuously reachable from E as an element of $\mathbb{R}^{2N}$ while preserving edge lengths. i.e. for each element E' of $C(E)$ and each magic bars of the spirit connecting magic joints u and v, the euclidean distance between u and v must be the same in E and E'.

The **degree of freedom** of E is the minimum non-negative integer k such that there exists a continuous bijective mapping $F : D \to C(E)$ where D is a connected subset of $\mathbb{R}^k$.

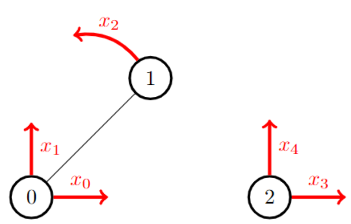
The **degree of freedom** of a spirit is the maximum degree of freedom over all such embeddings E.

The following illustrate the spirit fabulized by LaLa along with one of the optimal embedding and the mapping F for each sample tests in order.

1. $k = 5$, $D = \mathbb{R}^2 \times [0, 2\pi) \times \mathbb{R}^2$

   $F : (x_0, x_1, x_2, x_3, x_4) \mapsto \langle (x_0, x_1), (x_0, x_1) + (\cos x_2, \sin x_2), (x_3, x_4) \rangle$

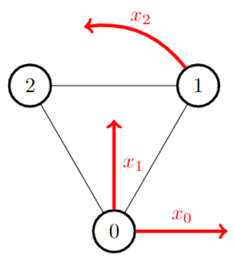
   The following illustrates the 5 degrees of freedom associated with each variables.



2. $k = 3$, $D = \mathbb{R}^2 \times [0, 2\pi)$

$F : (x_0, x_1, x_2) \mapsto \langle (x_0, x_1), (x_0, x_1) + (\cos x_2, \sin x_2), (x_0, x_1) + (\cos(\frac{\pi}{3} + x_2), \sin(\frac{\pi}{3} + x_2))\rangle$

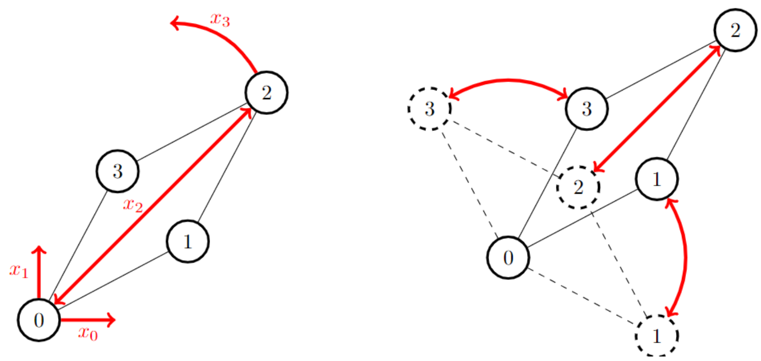
The following illustrates the 3 degrees of freedom associated with each variables.



3. $k = 4$, $D = \mathbb{R}^2 \times (((0, 2] \times [0, 2\pi)) \cup (\{0\} \times [0, \pi)))$

   $F : (x_0, x_1, x_2, x_3) \mapsto \langle P_0, P_0 + \frac{x_2}{2}P_1 + \sqrt{1 - \frac{x_2^2}{4}}P_2, P_0 + x_2P_1, P_0 + \frac{x_2}{2}P_1 - \sqrt{1 - \frac{x_2^2}{4}}P_2\rangle$
   where $P_0 = (x_0, x_1), P_1 = (\cos x_3, \sin x_3)$ and $P_2 = (\sin x_3, -\cos x_3)$.

   The following figure on the left illustrates the 4 degrees of freedom associated with each variables. Note that the motion associated with the variable x_2 is non-rigid. The one on the right illustrates the motion associated with x_2 in detail.



4. $k = 6$, $D = \mathbb{R}^2 \times [0, 2\pi)^4$

   $F : (x_0, x_1, x_2, x_3, x_4, x_5) \mapsto \langle P_0, P_1, P_2, P_3, P_4\rangle$
   where $P_0 = (x_0, x_1)$ and $P_i = P_{i-1} + (\cos x_{i+1}, \sin x_{i+1})$ for all integers $1 \le i \le 4$.

   The following illustrates the 6 degrees of freedom associated with each variables.