Bichromatic Cycles

Input file:	`standard input`
Output file:	`standard output`
Time limit:	10 seconds
Memory limit:	512 megabytes

You are given an undirected graph. You must color each vertex of the graph in such a way that the following two conditions are met:

- There is no monochromatic cycle[1] in the graph, i.e., there is no cycle whose vertices are all of the same color.
- For each pair of distinct colors c_1, c_2 that appear in the graph, there exists a bichromatic cycle with colors c_1 and c_2, i.e., there is a cycle that contains at least one vertex of color c_1, at least one vertex of color c_2, and no vertices of any other color.

Report whether or not it is possible to do so, and, if it is, provide a valid coloring.

Input

The first line contains an integer T ($1 \le T \le 2000$), the number of independent test cases to process.

Each case begins with a line containing two integers n and m ($2 \le n \le 10^6$, $1 \le m \le 3 \cdot 10^6$), the number of vertices and the number of edges in the graph, respectively.

This is followed by m lines, the i-th of which contains two integers u_i and v_i ($1 \le u_i, v_i \le n$, $u_i \ne v_i$) — the vertices that the i-th edge connects. There is at most one edge between every pair of vertices.

The sum of $(n + m)$ for all cases is at most $4 \cdot 10^6$.

Output

For each case, if there is no valid coloring, print a single line with the word "`NO`". Otherwise, print a line with the word "`YES`" followed by an integer C ($1 \le C \le n$), the number of colors you will use.

Then, print a new line with n integers between 1 and C, the i-th of which is the color assigned to vertex i. For all $1 \le i \le C$, there should be no cycle with vertices of color i, and for all $1 \le i < j \le C$, there should be a cycle with vertices of colors i and j. If there are multiple possible colorings, you can print any of them.

We strongly recommend using fast I/O for this problem.

[1] A <u>cycle</u> in a graph is a list of distinct vertices $(v_1, \ldots, v_c)$, where $c \ge 3$, such that for all $1 \le i < c$ there is an edge between vertices v_i and v_{i+1}, and there is also an edge between v_c and v_1.

Example

standard input	standard output
2 5 8 1 2 1 3 1 4 2 3 5 1 4 3 4 5 5 2 4 2 1 2 3 4	YES 3 1 2 2 3 3 YES 1 1 1 1 1

Note

The figure below shows one possible coloring for the first example. There are no cycles with vertices of the same color, and, for each pair of colors, there exists a cycle with just those two colors: for colors 1 and 2, the cycle is $(1, 2, 3)$; for colors 1 and 3, it is $(1, 4, 5)$; and for colors 2 and 3, it is $(2, 3, 4, 5)$.