An undirected graph with *N* nodes and *M* bidirectional edges is given. A simple path is a sequence of $K\geq 1$ nodes *V1, V2, …, VK*, such that $V\_{i}\ne V\_{j}$ for $i\ne j$ and there exists an edge between $V\_{i}$ and $V\_{i+1}$ for *i=1, 2, …, K-1*.

We define the value of a simple path *V1, V2, …, VK*, to be

$\sum\_{i=1}^{K}i×V\_{i}$. Write a program **maxpath** which finds a path with as large value as possible.

**Input**

The first line of the input file maxpath.in contains two positive integers *N* and *M* – the number of nodes and the number of edges in the graph, respectively. The next *M* lines contain two integers each, representing the edges of the graph. It’s guaranteed that there are no self-loops or duplicate edges.

**Output**

On the first line of the output file maxpath.out print a single positive integer *K* – the number of nodes in the path found by your program. On the next *K* lines, print the number of the current node in the path.

**Scoring**

If the output doesn’t follow the format or the printed nodes don’t form a simple path, you will receive 0 points for the test.

Otherwise, you will receive $score × (\frac{yours+1}{best+1})^{2}$ points, where *score* is the number of points the test is worth, *yours* is the value of the path you found and *best* is the greatest value of a path among all participants for the given test.

**Constraints**

|  |  |
| --- | --- |
| Portion of tests | Constraints on N and M |
| 30% | $$N=100, M\in [\frac{N\left(N-1\right)}{40}; \frac{N\left(N-1\right)}{5}]$$ |
| 30% | $$N=1 000, M\in [\frac{N\left(N-1\right)}{40}; \frac{N\left(N-1\right)}{10}]$$ |
| 40% | $$N=100 000, M\in [200 000; 500 000]$$ |

In each of the three groups in the table above, half of the test cases will be generated with algorithm 1 and the other half – with algorithm 2, mentioned below.

**Test generation**

Two algorithms are used for generating the graphs:

* *Algorithm 1:* We generate a tree by assigning to each node a random parent with smaller number (except for node 1). We add edges *(x,y)* to the obtained graph, as long as they are not already in the graph, until the total number of edges becomes *M*. After that, the nodes’ numbers are shuffled randomly.
* *Algorithm 2:* We generate a random number *T1* from *1* to *N*, then a random number *T2*from *T1+1* to *N* and so on, until *Tk* becomes equal to *N*. We form *K* paths (meaning that we connect the nodes with edges in the given order): *{1, 2, …, T1}, {T1+1, T1+2, …, T2}, …, {Tk-1+1, …, Tk=N}*. From each path, except for the first one, a random node is chosen and an edge between it and a random node from the previous paths is added. We add edges *(x,y)* to the obtained graph, as long as they are not already in the graph, until the total number of edges becomes *M*. After that, the nodes’ numbers are shuffled randomly.

**Time limit: 5 s**

**Memory limit: 256 MB**

**Sample test**

|  |  |
| --- | --- |
| **Input (maxpath.in)** | **Output (maxpath.out)** |
| 5 51 22 32 52 43 5 | 44235 |

The proposed output is a path of value 37.

