Divide the tree

Max. Marks: 100

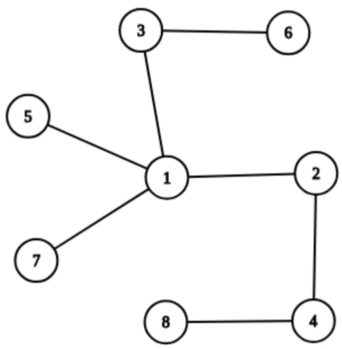
This is an approximate problem.

Let's define tree T_K in the following way:

1. T_1 is a tree with just one vertrex.

2. If $K > 1$ then let D be the biggest integer such that $D|K$ and $1 \le D < K$. The tree T_K will be the union of T_{K-1} with vertex $\{K\}$ and edge (D, K).

The image below represents the tree T_8.



Two graphs $G_1 = (\{A_1, A_2, \ldots, A_M\}, E_1)$ & $G_2 = (\{B_1, B_2, \ldots, B_M\}, E_2)$ are isomorphic if there exists a permutation P of length M such that $\forall\ (i, j),\ (A_i, A_j) \in E_1 \iff (B_{P_i}, B_{P_j}) \in E_2$.

Given a tree F with N vertices. Let E be the set of edges. You need to delete some edges from the tree, such for every disjoint tree U in the remaining forest there exists an integer i such that U is isomorphic to T_i.

Input

The first line contains two integers - N, W.

The following $N-1$ lines contain two integers - U, V, meaning there is edge (U, V) in tree F.

Scoring

Suppose the sizes of the trees in the remaining forest are $S_1, S_2, \ldots, S_L$. Let $R = \frac{\sum_{i=1}^{L} S_i^3}{W}$, then your score will be equal to $10000^{\min(1.25, R)} + max(0, R - 1.25) \cdot 10$. You want to maximize this score.

Output

The first line contains one integer - L.

The $(i+1)^{th}$ line has the following format - $S_i, P_1, P_2, \ldots, P_{S_i}$. P is a set of vertices, representing a tree in the remaining forest. The condition $\forall (x, y), (x, y) \in T_{S_i} \iff (P_x, P_y) \in E$ must be satisfied.

We must have that $\sum_{i=1}^{L} S_i = N$. Every vertex must appear exactly once.

Test Generation

For the first 10 tests. At first, an array V of length K is generated uniformly under the conditions attached below. Then, we generate a forest containing trees $T_{V_1}, T_{V_2}, \ldots, T_{V_K}$ with indices from 1 to N. After this, random edges are added in order to transform the forest into tree F. W will be assigned value $\sum_{i=1}^{K} V_i^3$.

The rest of the tests have random trees. W will be assigned value $21N$.

Test	N	$V_i \le$	$V_i \ge$	Special Conditions
1	100	4	1	No
2	100000	4	1	No
3	100000	10	1	No
4	100000	20	10	No
5	100000	10000	10	There exists only one i with $V_i = 10000$, for the rest of $j \ne i$ $V_j \le 20$ is satisfied
6	100000	10000	1	There exists only

DEVELOPERS	RESULT	LANGUAGE
Veeraj S Khokale...		C++14
Veeraj S Khokale...		C++14
Veeraj S Khokale...		C++14
Veeraj S Khokale...		C++14
Veeraj S Khokale...		C++14
Veeraj S Khokale...		C++14
Veeraj S Khokale...		C++14

View All

6	100000	10000	1	There exists only one i with $V_i = 10000$, for the rest of $j \neq i$ $V_j \leq 5$ is satisfied
7	1000	100	10	There exists only one i with $V_i = 100$, for the rest of $j \neq i$ $V_j \leq 20$ is satisfied
8	1000	100	1	There exists only one i with $V_i = 100$, for the rest of $j \neq i$ $V_j \leq 5$ is satisfied
9	100000	1000	1	No
10	100000	1000	100	No
11	10	-	-	No
12	100	-	-	No
13	1000	-	-	No
14	10000	-	-	No
15	100000	-	-	No

Note that the tests are ordered in the same way as presented in the table above.

Test data will be regenerated with different seeds after the contest.

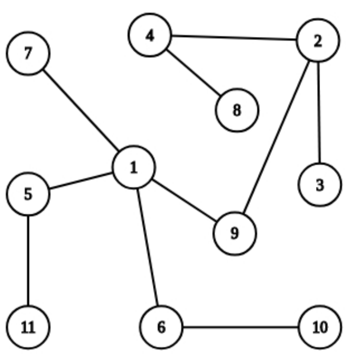
SAMPLE INPUT

```
11 407
1 7
1 6
6 10
5 11
1 9
1 5
9 2
2 3
2 4
4 8
```

SAMPLE OUTPUT

```
2
4 2 4 3 8
7 1 6 5 10 7 11 9
```

Explanation



Suppose that $K = 2, V_1 = 7, V_2 = 4$, then $W = 7^3 + 4^3 = 407$. We created trees T_7 with indices $\{1, 5, 6, 7, 10, 11\}$ and T_4 with indices $\{2, 3, 4, 8\}$. Next, to connect both trees, we add edge $(9, 2)$.

Note that we can also delete edges $\{(3, 2), (2, 4), (4, 8)\}$, but then we would obtain a smaller cost equal to $7^3 + 4 \cdot 1^3 = 347$ compared to $7^3 + 4^3 = 407$.

Time Limit:	5.0 sec(s) for each input file.
Memory Limit:	256 MB
Source Limit:	1024 KB
Marking Scheme:	Marks are awarded if any testcase passes.
Allowed Languages:	Bash, C, C++, C++14, Clojure, C#, D, Erlang, F#, Go, Groovy, Haskell, Java, Java 8, JavaScript(Rhino), JavaScript(Node.js), Julia, Kotlin, Lisp, Lisp (SBCL), Lua, Objective-C, OCaml, Octave, Pascal, Perl, PHP, Python, Python 3, Racket, Ruby, Rust, Scala, Swift, Swift-4.1, Visual Basic

CODE EDITOR

Enter your code or Upload your code as file. Save Bash (GNU bash, version 4.3

```
# Sample bash code
```

1:1

Press Ctrl/Command+Spacebar for autocomplete suggestions (accuracy dependent on connection stability).

Provide custom input

COMPILE & TEST SUBMIT

Tip: You can submit any number of times you want. Your best submission is considered for computing total score.

Your Rating:

