ITACPC Sabotage! (virus)

You finally gained access to the infrastructure of the ITACPC network, and you are ready to launch your attack to sabotage the contest. The network is made of N nodes grouped in K clusters numbered from 1 to K, with node (k, i) (the i-th node in cluster k) having a security level $s_{k,i} > 0$. There is a direct link between node (k, i) and node (h, j) if and only if $|k - h| \leq 1$ and $|s_{k,i} - s_{h,j}| \leq D$. It is guaranteed that the subnetwork of each cluster is connected, i.e. there is a sequence of links between any two nodes in the same cluster which does not leave the cluster.

You prepared a devious virus which can infect nodes as soon as it enters them and can navigate from node to node by following links. Your goal is maximum destruction, therefore you want to infect at least one node in each cluster.

Your access point is a public node outside the network with security level 0, connected to all nodes (k, i) (in any cluster) with security level $s_{k,i} \leq D$. This node will also serve as your escape route after the operation, allowing you to leave without any trace.

You must be careful with the path your virus takes, though, because the ITACPC staff will detect you if you make one of the following mistakes:

- You enter the same node more than once.
- You enter the same cluster more than once.
- You enter the network more than once.

By "entering a cluster/network" we refer to entering a node belonging to the cluster/network from a node not belonging to the cluster/network.

Scared of the attack, the ITACPC staff decided to turn off most of the intra-cluster links, while keeping the cluster connected to allow the contest to continue. In particular, if a cluster k contains N_k nodes, then all links connecting two nodes in cluster k have been disabled except for exactly N_k of them (it is guaranteed that there were initially at least N_k links), and there still exists a sequence of active links between any two nodes in the cluster which does not leave the cluster. All other links between nodes in different clusters and between the access point and the network have been left unaffected.

You laugh at these countermeasures and you can already taste your victory. You even have some time to waste before the attack, and you wonder: how many different subsets of nodes can you infect in a successful attack, i.e. an attack where you infected at least one node in each cluster and you managed to leave undetected?

Input

The first line contains two integers K and D, respectively the number of clusters and the maximum security level difference for nodes connected by a link.

Then K blocks follow, each describing a cluster.

The k-th block starts with a line containing the integer N_k, the number of nodes in cluster k.

The following line of the block contains N_k integers $s_{k,0}, s_{k,1}, \ldots, s_{k,N_k-1}$, describing the security level of each node in section k.

The following N_k lines of the block contain 2 distinct integers i and j, indicating that the link connecting nodes (k, i) and (k, j) is still active.

Recall that all links between the nodes (including the access point) are implicitly defined by the cluster indices and by the security levels as described in the statement, and the input only reports the links within the clusters which have not been turned off.

Output

You should output one line containing a single integer: the number of distinct subsets of nodes that can be infected after a successful attack, as defined in the statement. Since this number may be large, output it modulo $10^9 + 7$.

Constraints

- $1 \le K \le 500$.
- $1 \le D \le 10^9$.
- $3 \le N_k \le 1500$ for each k.
- $N = \sum_{k=1}^{K} N_k \le 1500$.
- $1 \le s_{k,i} \le 10^9$ for each k, i.
- There is at most one link between any pair of nodes and there is no link connecting a node to itself.
- It is guaranteed that each of the provided links satisfies $|s_{k,i} - s_{k,j}| \le D$.
- It is guaranteed that from any node in cluster k it is possible to reach any other node in the same cluster without leaving the cluster.

Examples

input	output
2 10 4 20 15 10 5 0 1 0 2 1 3 2 3 5 4 8 12 16 20 0 2 1 2 3 2 4 2 4 3	92

Explanation

In this example, the links that have been turned off and are unusable are $(0,1)-(0,2)$, $(1,0)-(1,1)$ and $(1,1)-(1,3)$, as their difference in security level is $\le D$ but they are not listed among the active links within the respective clusters.

One possible attack is to enter nodes in the order $A \to (0,3) \to (0,2) \to (1,1) \to A$, where A denotes the access point, and thus infecting the set of nodes $\{(0,2),(0,3),(1,1)\}$.

Observe that this same set of nodes can also be infected with other attacks, for example by entering nodes in the order $A \to (1,1) \to (0,3) \to (0,2) \to A$, but it counts as only one distinct subset towards the answer.