D. D/D/D

time limit per test: 2 seconds
memory limit per test: 512 megabytes

Of course, a problem with the letter D is sponsored by Declan Akaba.

You are given a simple, connected, undirected graph with n vertices and m edges. The graph contains no self-loops or multiple edges. You are also given a multiset A consisting of ℓ elements:

$$A = \{A_1, A_2, \ldots, A_\ell\}$$

Starting from vertex 1, you may perform the following move **any number** of times, as long as the multiset A is not empty:

- Select an element $k \in A$ and remove it from the multiset . You must remove exactly one occurrence of k from A.
- Traverse any walk* of exactly k edges to reach some vertex (possibly the same one you started from).

For each i ($1 \le i \le n$), determine whether there exists a sequence of such moves that starts at vertex 1 and ends at vertex i, using the original multiset A.

Note that the check for each vertex i is independent — you restart from vertex 1 and use the original multiset A for each case.

*A walk of length k is a sequence of vertices $v_0, v_1, \ldots, v_{k-1}, v_k$ such that each consecutive pair of vertices (v_i, v_{i+1}) is connected by an edge in the graph. The sequence may include repeated vertices.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \le t \le 10^4$). The description of the test cases follows.

The first line of each test case contains three integers n, m, and ℓ ($2 \le n \le 2 \cdot 10^5$, $n - 1 \le m \le 4 \cdot 10^5$, $1 \le \ell \le 2 \cdot 10^5$) — the number of vertices, the number of edges, and the size of the multiset, respectively.

The second line of each test case contains ℓ integers $A_1, A_2, \ldots, A_\ell$ ($1 \le A_i \le 10^4$) — the elements of the multiset.

Each of the following m lines contains two integers u and v ($1 \le u < v \le n$) — the endpoints of an edge in the graph.

It is guaranteed that the edges form a simple, connected graph without self-loops or multiple edges.

It is guaranteed that the sum of n, the sum of m, and the sum of ℓ over all test cases does not exceed $2 \cdot 10^5$, $4 \cdot 10^5$, and $2 \cdot 10^5$, respectively.

Output

For each test case, output a binary string of length n, where the i-th character is `1` if there exists a sequence of moves ending at vertex i, and `0` otherwise.

Example

input

```
3
6 5 2
2 3
1 2
2 3
3 4
4 5
5 6
5 5 1
5
1 2
```

Codeforces Round 1025 (Div. 2)
Finished
Practice

→ Virtual participation

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Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
322053690	May/30/2025 15:45	Accepted
320107025	May/17/2025 19:01	Wrong answer on pretest 2
320105212	May/17/2025 18:58	Wrong answer on pretest 2
320102743	May/17/2025 18:54	Wrong answer on pretest 2

→ Problem tags

dfs and similar | graphs | greedy | shortest paths | *1900

No tag edit access

→ Contest materials

- Announcement (en)
- Tutorial (en)

```
2 3
3 4
4 5
3 5
5 4 3
100 200 300
1 2
1 3
1 4
2 5
```

output Copy

```
111101
11111
10001
```

Note

In the first test case:

- Vertex 1 is reachable without making any moves.
- Vertex 2 is reachable by selecting element $3 \in A$; one possible walk is $[1 \to 2 \to 1 \to 2]$.
- Vertex 3 can be reached by selecting element $2 \in A$ and taking the walk $[1 \to 2 \to 3]$.
- Vertex 4 is reachable by selecting element $3 \in A$ and following the walk $[1 \to 2 \to 3 \to 4]$.
- Vertex 5 is not reachable by any valid sequence of moves.
- Vertex 6 is reachable by first selecting element $2 \in A$ and taking the walk $[1 \to 2 \to 3]$, followed by selecting element $3 \in A$ and taking the walk $[3 \to 4 \to 5 \to 6]$.