IOI Training Camp 2017
Team Selection Tests, Day 1

Graph LIS

You are given a directed graph with N nodes and M edges. The nodes are numbered from 1 to N. Each node has a value A_i associated with it. It is guaranted that $A_i \neq A_j$ for $i \neq j$.

You need to find a walk on this graph such that if you write down the values written on each node of the walk in the order they are visited , the length of the Longest Increasing Subsequence of that sequence is maximized.

Formally , you need to find a sequence of nodes $V_1, V_2, V_3, \cdots, V_k$ such that, $\forall 1 \leq i < k$, there is an edge from V_i to V_{i+1} and the Longest Increasing Subsequence of $A_{V_1}, A_{V_2}, A_{V_3}, \cdots, A_{V_k}$ is longest among all walks.

You are allowed to visit a node any number of times and can start and end your journey anywhere. Note that the Longest Increasing Subsequence should be strictly increasing.

Input

The first line of the input contains 2 integers, N and M, denoting the number of nodes and edges in the graph.
The second line of input contains N integers $A_1, A_2, A_3, \cdots, A_N$.
The next M lines of the inputs consists of integers U_i, V_i denoting there is a directed edge from U_i to V_i.

Output

Output a single integer denoting the maximum length of the Longest Increasing Subsequence that you can achieve.

Constraints

- $1 \leq N \leq 10^3$
- $1 \leq M \leq 3 * 10^4$
- $1 \leq A_i \leq 10^9$
- All elements of the array A are distinct
- $1 \leq U_i, V_i \leq N, U_i \neq V_i$

Subtasks

Subtask 1 (6 Points):

- $1 \leq N \leq 10^2$
- $M = N - 1$
- The Graph is a Chain

Subtask 2 (15 Points):

- $1 \leq N \leq 10^2$
- $1 \leq M \leq 10^3$

Subtask 3 (79 Points):

- No Additional Constraints.

Sample Input 1

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

Sample Output 1

```
5
```

Sample Input 2

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

Sample Output 2

```
5
```

Limits

Time: 2 seconds

Memory: 256 MB