Tricolor gift

Marta likes three colors: white, black and Cambridge blue (it is an actual color). And Tomek likes Marta, so he took his 3D printer and printed n dots in the 3D space, i-th one has color c_i. He now wants to connect them with edges to form a graph that is a union of disjoint `wonderful` cycles. The cycle is `wonderful` when:

- it has at least 3 edges

- among every 3 consecutive dots the colors are unique

He has selected a set of m possible edges and sorted them by the difficulty of implementation, i-th one having a difficulty of i and connecting dot a_i with dot b_i. He now wants to select a subset of those to finish his lovely gift for (not) his lovely girl. Moreover, if there are many such subsets, he wants to minimize the highest difficulty of implementation among its edges. Find this highest difficulty!

Conditions

- $1 \le n \le 1000, 1 \le m \le 10\,000$

- n is divisible by 3.

- $1 \le a_i, b_i \le n$

- $1 \le c_i \le 3$

- There cannot be any loops or multiple edges in the graph.

Input

```
n m
c_1 c_2 ... c_n
a_1 b_1
...
a_m b_m
```

Output

Help Tomek and print the maximum difficulty needed to complete the task, or print `NO` if no subset of given edges results in a desired graph made of `wonderful cycles`.

Scoring

Subtask	Constraints	Points
1	$n \le 15$	33
2	$n \le 45$	39
3	no additional constraints	28

Example

Input	Output
6 8 1 3 2 1 3 2 1 2 2 3 3 1 3 4 4 5 5 6 6 1 3 5	7
6 10 3 3 1 1 2 2 4 1 3 6 6 2 5 3 3 4 4 5 1 5 2 4 3 2 2 1	9
6 6 1 2 3 3 2 1 1 2 2 3 3 4 4 5 5 6 6 1	NO