Problem F
Fell Walking

You are creating a tour of the Peak District hills for a friend visiting from the Netherlands. The walk will go from the locally famous viewpoint "Hill 1" to the world-famous viewpoint "Hill 2".

To make this friend feel at home, you want to minimise the difference in height between the highest and lowest hills of the walk.

Given a graph of the local points of interest and paths between them, find such an optimally-flat route.

Input

- One line containing the number of hills, n ($2 \leq n \leq 5,000$), and the number of trails connecting them, m ($1 \leq m \leq 25,000$).
- One line containing n integers $h_1 \ldots h_n$ ($0 \leq h \leq 10^6$), the heights in metres of the hills from 1 to n.
- m further lines, the i-th of which contains two integers a and b ($1 \leq a, b \leq n$) indicating that there is a bi-directional path between hills a and b.

It is guaranteed that there is a path (direct or indirect) between hills 1 and 2.

Output

Output the minimum possible distance between the maximum and minimum heights of hills encountered on a walk between hills 1 and 2.

Sample Input 1	Sample Output 1
5 6 1 2 3 4 5 1 3 1 5 2 4 3 4 4 5 5 2	3

Sample Input 2	Sample Output 2
6 6 50 50 5 50 30 70 6 5 3 1 1 6 1 3 5 2 4 2	40