

F. « Two Ships »

Problem

You survived the storm and hunted treasures with your crew, now you want to earn the respect of your enemies and conquer the seven seas! The fights go on and on, and after a bloody battle, you managed to capture an enemy ship, which will help you to establish your domination and satisfy your ambitions.



After the battle

Merciless, you threw at sea all the sailors that used to have this ship. You shall now choose N of your own sailors who will quit your ship and go on the second one that you captured. As an experienced captain, you want to use this opportunity in the best possible way. Indeed, some sailors have a rival, they will each try to kill the other in the chaos of a battle : therefore you should put rivals on a different boat. There are P rivalries of this kind. By chance, a pirate can have at most one rival.

Moreover, you want to balance the weight of your two ships : the heavier a boat, the slower. And your fleet will be more efficient if the boats have the same speed. The two crews should have the smallest possible difference.

You want to find out the most balanced division of your crew so that no couple of rivals ends up on the same boat.

- No pirate can be placed on the same boat that their rival ;
- If Rose is Trevor's rival, then Trevor is Rose's rival ;
- All the pirates should be on a ship, nobody can be thrown at sea (no waste, you're an eco-friendly captain) ;
- There is always a division of the crew such that these rules are observed.

Input

- On the first line, an integer $1 \leq N \leq 500$: the number of pirates ;
- On the second line, an integer $0 \leq P \leq \frac{N}{2}$ the number of rivalries ;
- On the third line, N space-separated integers : the weights of the pirates, where $1 \leq W_i \leq 100$ is the weight of pirate i ;

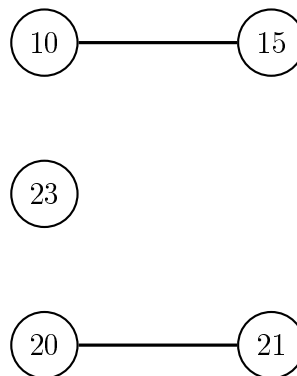
- On the P following lines, 2 integers A and B representing a rivalry between pirates A and B (pirates are given numbers from 0 to $N - 1$ in the same order as their weights are given on second line).

Output

- An integer : the minimum difference of weight between the two crews, without breaking the rules defined above.

Examples

Example 1



In this example, we divided the crew in two :

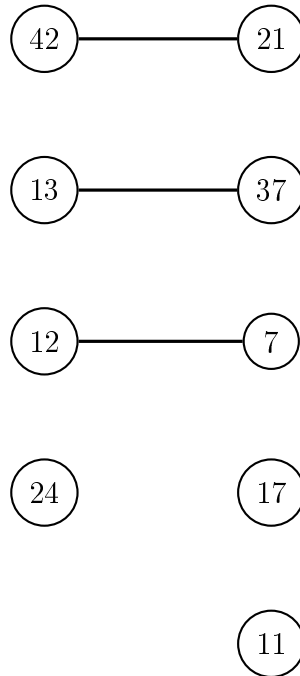
- The pirates with weights 10, 23 and 20 on a ship ;
- The pirates with weights 15 and 21 on the other.

The difference of weight is $53 - 36 = 17$.

Input
5
2
10 23 15 20 21
0 2
4 3

Output
17

Example 2



In this example, we divided the crew with on the one hand $42 + 13 + 12 + 24 = 91$, on the other hand $21 + 37 + 7 + 17 + 11 = 93$, soit une différence de 2.

Input
9
3
21 42 13 37 7 12 17 11 24
0 1
2 3
4 5

Output
2