

Panda Islands

Mr Panda has recently bought N icy islands and has decided to repaint them (conveniently numbered $1..N$) with a chess theme! Since he is panda, he wishes to paint every island **either black or white**. Also, everyone knows that on a chessboard, white squares aren't next to white squares and black squares aren't next to black squares. Thus, in a similar vein, **if two islands are connected by a bridge, one of them must be black and the other must be white**. Also, since icy islands are already white (or at least, whitish), Mr Panda only needs to buy some black paint now. Help him find the minimum amount of black paint he needs!

You are given the area of each island (in terms of Pm^2 , Panda metres squared) as well as a list of which islands are connected by bridges. It is **guaranteed that there is a valid way to paint the islands such that no two connected islands have the same colour**. Thus, output the *minimum* amount of area in Pm^2 which needs to be painted black. Note that **not all islands might be connected**!

Input

On the first line are integers N and E , where N is the number of icy islands and E is the number of bridges. ($1 \leq N \leq 50,000$, $1 \leq E \leq 300,000$)

The next N lines each contain one integer X , with the i -th line representing the area of the island numbered i . ($1 \leq X \leq 40,000$).

The next E lines each contain two integers A and B , meaning that islands A and B are connected by a bridge.

Output

Output consists of a single line containing S , the *minimum* area which needs to be painted black, in Pm^2 .

Limits

- $0 < N \leq 50,000$ and $0 < E \leq 300,000$
- $0 < X \leq 40,000$ - each island will not exceed 40,000 Pm^2 .
- The islands are 1-indexed. Hence $1 \leq A, B \leq N$.

Sample Testcase 1

Sample Input (pandaislands1.in)	Sample Output (pandaislands1.out)
5 6 1 2 3 4 5 1 2 2 3 3 4 1 4 3 5 1 5	4

Explanation for Sample Testcase 1

By painting islands 1 and 3, we fulfill the given conditions and use 4 Pm^2 of black paint. We could also paint islands 2, 4 and 5 black, but this would not be minimal, as it uses 11 Pm^2 of black paint instead.

Notes:

1. You should develop your program in the subdirectory **ex2** and use the skeleton java file provided. You should not create a new file or rename the file provided.
2. You are free to define your own helper methods and classes (or remove existing ones).
3. Please be reminded that the marking scheme is:
 - a. Public Test Cases (1%) - 1% for passing **all** test cases, 0% otherwise
 - b. Hidden Test Cases (1%) - Partial scoring depending on test cases passed
 - c. Manual Grading (1%)
 - i. Overall Correctness (correctness of algorithm, severity of bugs)
 - ii. Coding Style (meaningful comments, modularity, proper indentation, meaningful method and variable names)
4. Your program will be tested with a time limit of not less than **2 sec** on Codecrunch.

Skeleton File – Pandaislands.java

You are given the skeleton file Pandaislands.java. You should see a non-empty file when you open the skeleton file. Otherwise, you might be in the wrong working directory.

You should see the following contents when you open the skeleton file:

```
import java.util.*;
public class PandaIslands {
    private void run() {
        //implement your "main" method here
    }
    public static void main(String[] args) {
        PandaIslands newPandaIslands = new PandaIslands();
        newPandaIslands.run();
    }
}
```