**题目使用文件输入输出**

**提交程序文件名每道题有写在题目名字右侧，读入文件xxx.in，输出文件xxx.out，提交文件xxx.cpp**

**一12 二12 三10 四10**

第一题 （262144）

Bessie likes downloading games to play on her cell phone, even though she does find the small touch screen rather cumbersome to use with her large hooves.

She is particularly intrigued by the current game she is playing. The game starts with a sequence of NN positive integers (2≤N≤262,1442≤N≤262,144), each in the range 1…401…40. In one move, Bessie can take two adjacent numbers with equal values and replace them a single number of value one greater (e.g., she might replace two adjacent 7s with an 8). The goal is to maximize the value of the largest number present in the sequence at the end of the game. Please help Bessie score as highly as possible!

INPUT FORMAT (file 262144.in):

The first line of input contains NN, and the next NN lines give the sequence of NN numbers at the start of the game.

OUTPUT FORMAT (file 262144.out):

Please output the largest integer Bessie can generate.

SAMPLE INPUT:

4

1

1

1

2

SAMPLE OUTPUT:

3

In this example shown here, Bessie first merges the second and third 1s to obtain the sequence 1 2 2, and then she merges the 2s into a 3. Note that it is not optimal to join the first two 1s.sequence 1 2 2, and then she merges the 2s into a 3. Note that it is not optimal to join the first two 1s.

一个长度为n（n<=2^18）的序列，初始元素值均为1到40之间的整数，每次操作可以将两个相邻的并且大小相同的正整数替换成一个比原数大一的正整数。要求最大化最终数列中的最大值。并输出最大值

例如给定一个序列： 1,1,1,2   我们可以先将第二个1和第三个1合并替换成2 。序列变成：1,2,2。再将两个二合并，序列变成1,3.由此我们得到最大值3.

当然我们也可以将第一个1和第二个1合并，序列变成2,1,2.然而这样我们就不能再合并了，最大值只有二，不是最优情况。

第二题 （landscape）

Farmer John is building a nicely-landscaped garden, and needs to move a large amount of dirt in the process.

The garden consists of a sequence of NN flowerbeds (1≤N≤100,0001≤N≤100,000), where flowerbed ii initially contains AiAi units of dirt. Farmer John would like to re-landscape the garden so that each flowerbed ii instead contains BiBi units of dirt. The AiAi's and BiBi's are all integers in the range 0…100…10.

To landscape the garden, Farmer John has several options: he can purchase one unit of dirt and place it in a flowerbed of his choice for XX units of money. He can remove one unit of dirt from a flowerbed of his choice and have it shipped away for YYunits of money. He can also transport one unit of dirt from flowerbed ii to flowerbed jj at a cost of ZZ times |i−j||i−j|. Please compute the minimum total cost for Farmer John to complete his landscaping project.

**INPUT FORMAT (file landscape.in):**

The first line of input contains NN, XX, YY, and ZZ (0≤X,Y≤108;0≤Z≤10000≤X,Y≤108;0≤Z≤1000). Line i+1i+1 contains the integers AiAi and BiBi.

**OUTPUT FORMAT (file landscape.out):**

Please print the minimum total cost FJ needs to spend on landscaping.

**SAMPLE INPUT:**

4 100 200 1

1 4

2 3

3 2

4 0

**SAMPLE OUTPUT:**

210

Note that this problem has been asked in a previous USACO contest, at the silver level; however, the limits in the present version have been raised considerably, so one should not expect many points from the solution to the previous, easier version.

农夫约翰正在建造一个美丽的花园，在这个过程中需要移动大量的泥土。花园由N个花圃（1≤N≤100,000）组成，

第i个花圃最开始有Ai个泥土。 农夫约翰想要重新整理花园，使每个花圃最后有Bi个泥土。Ai和Bi都是0...10范围

内的整数。为了整理花园，Farmer John有几个选择：他可以购买一个单位的泥土，并将它放在他选择的花圃中，

用X单位的钱。 他可以从他选择的花圃上清除一块泥土，并用Y单位的钱运出去。他还可以用Z\*|i-j|的花费将一单

位的泥土从花圃i运输到花圃j。请计算农民约翰完成他的绿化项目的最低总成本。

Input

第一行输入包含N，X，Y和Z（0≤X，Y≤10^8; 0≤Z≤1000）。

行i + 1包含整数Ai和Bi。

Output

请输出FJ需要花在园林绿化上的最低总成本。

第三题 （closing）

Farmer John and his cows are planning to leave town for a long vacation, and so FJ wants to temporarily close down his farm to save money in the meantime.

The farm consists of NN barns connected with MM bidirectional paths between some pairs of barns (1≤N,M≤200,0001≤N,M≤200,000). To shut the farm down, FJ plans to close one barn at a time. When a barn closes, all paths adjacent to that barn also close, and can no longer be used.

FJ is interested in knowing at each point in time (initially, and after each closing) whether his farm is "fully connected" -- meaning that it is possible to travel from any open barn to any other open barn along an appropriate series of paths. Since FJ's farm is initially in somewhat in a state of disrepair, it may not even start out fully connected.

**INPUT FORMAT (file closing.in):**

The first line of input contains NN and MM. The next MM lines each describe a path in terms of the pair of barns it connects (barns are conveniently numbered 1…N1…N). The final NN lines give a permutation of 1…N1…N describing the order in which the barns will be closed.

**OUTPUT FORMAT (file closing.out):**

The output consists of NN lines, each containing "YES" or "NO". The first line indicates whether the initial farm is fully connected, and line i+1i+1 indicates whether the farm is fully connected after the iith closing.

SAMPLE INPUT:

4 3

1 2

2 3

3 4

3

4

1

2

SAMPLE OUTPUT:

YES

NO

YES

YES

FJ和他的奶牛们正在计划离开小镇做一次长的旅行，同时FJ想临时地关掉他的农场以节省一些金钱。

这个农场一共有被用M条双向道路连接的N个谷仓(1<=N,M<=3000)。为了关闭整个农场，FJ 计划每一次关闭掉一个谷仓。当一个谷仓被关闭了，所有的连接到这个谷仓的道路都会被关闭，而且再也不能够被使用。

FJ现在正感兴趣于知道在每一个时间（这里的“时间”指在每一次关闭谷仓之后的时间）时他的农场是否是“全连通的”——也就是说从任意的一个开着的谷仓开始，能够到达另外的一个谷仓。注意自从某一个时间之后，可能整个农场都开始不会是“全连通的”。

第四题（reduce）

Farmer John's NN cows (5≤N≤50,0005≤N≤50,000) are all located at distinct positions in his two-dimensional field. FJ wants to enclose all of the cows with a rectangular fence whose sides are parallel to the x and y axes, and he wants this fence to be as small as possible so that it contains every cow (cows on the boundary are allowed).

FJ is unfortunately on a tight budget due to low milk production last quarter. He would therefore like to build an even smaller fenced enclosure if possible, and he is willing to sell up to three cows from his herd to make this possible.

Please help FJ compute the smallest possible area he can enclose with his fence after removing up to three cows from his herd (and thereafter building the tightest enclosing fence for the remaining cows).

For this problem, please treat cows as points and the fence as a collection of four line segments (i.e., don't think of the cows as "unit squares"). Note that the answer can be zero, for example if all remaining cows end up standing in a common vertical or horizontal line.

**INPUT FORMAT (file reduce.in):**

The first line of input contains NN. The next NN lines each contain two integers specifying the location of a cow. Cow locations are positive integers in the range 1…40,0001…40,000.

**OUTPUT FORMAT (file reduce.out):**

Write a single integer specifying the minimum area FJ can enclose with his fence after removing up to three carefully-chosen cows from his herd.

**SAMPLE INPUT:**

6

1 1

7 8

10 9

8 12

4 100

50 7

**SAMPLE OUTPUT:**

12

农夫约翰的N(5<=N<=50000)头牛被定在了平面内的不同的位置。他想用栅栏(平行于x和y轴)围住所有的牛。他想这个栅栏尽可能小(牛在边界上也被视作围住)。   
他因为牛奶产量低而感到经费紧张，所以他想卖掉三头牛再围起剩下的牛。请算出栅栏围出的最小面积。