2017 Wuhan University Programming Contest Online Round

ACM/ICPC Team of Wuhan University

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Problem A. One car comes and one car goes

Input file:	`standard input`
Output file:	`standard output`
Time limit:	0.25 seconds
Memory limit:	512 mebibytes

Two cars from the East Station and the west Station started to drive toward each other, and they met 60 miles away from the East Station first. Both of them kept their original speed until reached the other station, then they returned immediatly. At a distance of 30 miles from the West Station they met the second time. Calculate the distance between two stations.

Output

Output one number, your answer will be considered as correct if the relative or absolute error is less than 10^{-4}.

Problem B. Color

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 mebibytes

When Asuho was just a little girl, she has been loving stars, as there are so many romantic stories about old legends and the stars.

Today, as usual, Asuho went to the observatory with her beloved boyfriend, Kogasaka Ming, to see the splendid sky of galaxy. Sitting with Kogasaka shoulder to shoulder, Asuho thought nothing could make her happier.

"Asuho," Kogasaka called Asuho softly. "I have a question about the Hoshizora(night sky with stars)."

"Whats it?" Asuho answered, happily. "I know everything about the stories, you can ask anything."

Kogasaka smiled, "You see the stars? Just imagine there are n distinct stars in the sky while $n-1$ relationships connect them. Each relationship is between two stars and all stars are connected directly or indirectly. Now you need to divide the n stars into m different types. Beware that no two directly connected stars should share the same type and some stars cannot be some types. I want you to tell me how many distinct solutions there could be."

Suddenly the Stella meteor shower appeared, so the lovers forgot the question and started to admire the beautiful Hoshizora.

Asuho thought it was unbelievable that Kogasaka should ask her such a foolish question which she cant solve. Of course she didnt wish to reveal her poor math. So can you help her to tell the answer?

Input

The Input file contains several test cases.

For each case, the first line contains two integers n ($2 \leq n \leq 10^4$), m ($1 \leq m \leq 20$)

The next $n-1$ lines, each line contains 2 integers x_i, y_i expressing relationships between the two stars.

The next n lines, each lines contains m numbers and each of the m is 0 or 1.

The i-th number of the j-th line respect whether j-th star can be divided into the i-th type. 1 means it could while 0 means not.

Output

For each test case, output one single line, containing the number of solutions module $10^7 + 9$

Examples

standard input	standard output
4 6 1 2 1 3 1 4 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	625

Problem C. Divide by Six

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 seconds
Memory limit:	512 mebibytes

A positive integer number n is written on a blackboard. It consists of not more than 10^5 digits. You have to transform it into a lucky number by erasing some of the digits, and you want to erase as few digits as possible.

The number is lucky if it consists of at least one digit, doesn't have leading zeroes and is a multiple of 6. For example, 0, 66,66666 are lucky numbers, and 00, 25, 77 are not.

Write a program which for the given n will find a lucky number such that n can be transformed into this number by erasing as few digits as possible. You can erase an arbitraty set of digits. For example, they don't have to go one after another in the number n.

Print the length of your answer after the erasing.

If it's impossible to obtain a lucky number, print `-1s`.

Input

The first line of input contains n – a positive integer ($1 \le n \le 10^{100000}$).

Output

Print one number the number of your lucky number obtained by erasing as few as possible digits. If there is no answer, print `WTF`.

Examples

standard input	standard output
0010456	4
11	-1s

Problem D. Events

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 mebibytes

Every year, the ACM/ICPC team will hold many contests, some of them are training while others are school contests.

In the year of 2017, there are n contests to be held, and at the beginning of year, we plans the time of each contest.

However, as things are changing. Some other events might affect the time of contest and our team leader wants to know some interesting things about the time of some events.

Input

The first line contains an integer n. ($0 < n \leq 10^5$)

The second line contains n integers, the i-th one of them is t_i, which is the planning time of contest i at the beginning of this year. ($0 \leq t_i \leq 10^9$)

The third line contains an integer q. And then q lines follows. ($0 < q \leq 10^5$)

Then each line contains three integers. L_i, R_i, T_i, means the time of L_i-th contest to R_i-th contest will be changed by T_i. And then you should output the earlist time of L_i-th contest to R_i-th contest in the history *after* the change of time. ($0 < L_i \leq R_i \leq n$, $|T_i| \leq 10^9$)

Output

Output contains q lines, i-th line is the answer after i-th query.

Examples

standard input	standard output
4 1 2 3 4 3 1 2 2 2 3 3 3 4 -10	1 2 -6

Note

At the beginning, t_i are $(1, 2, 3, 4)$. After the first change on time, t_i becomes $(3, 4, 3, 4)$, and then $(3, 7, 6, 4)$, and at last becomes $(3, 7, -4, -6)$.

Be careful that as the times are relative times, so they can be negative.

Problem E. Lost in WHU

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 mebibytes

As one of the most beautiful campus in China, Wuhan University is around several hills, so the road is complex and visitors always lose themselves. Give a undirected graph of WHU of N points and a deadline, then you should count the number of plan to reach the destination by deadline (the starting point is 1 and the ending point is N).

Input

First line contains the number of points N ($N \leq 100$) and the number of edges M ($M \leq N(N-1)/2$).

The i-th line of next M lines contains two numbers u_i and v_i, which respents an edge (u_i, v_i).

The last line contains the deadline $T(T \leq 10^9)$.

Output

The number of plan to reach the destination by deadline module $10^9 + 7$.

Examples

standard input	standard output
4 5 1 3 2 3 3 4 1 2 1 4 8	170

Problem F. Soul Artist

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 mebibytes

Last year, there were three soul artist in the team Abysswatcher. They were all addicted to painting, even when they were on the train. One day, they want to paint a paper. In i-th step, they choose a core grid (x_i, y_i) and paint all the grid near it (the Manhattan distance between the core and other grids are no more than r_i). After some operates, they want to know the maximum times they painted the same grid.

Input

Three integers $n, m, t (1 \le n, m \le 2000, 1 \le t \le 2 \times 10^5)$in one line. n and m represent the length and the width of the paper. t represents the times they painted.

In the following t lines, the i-th contains three non-negative integers x_i, y_i, r_i $(1 \le x_i - r_i, x_i + r_i \le n$, $1 \le y_i - r_i, y_i + r_i \le m)$.

Output

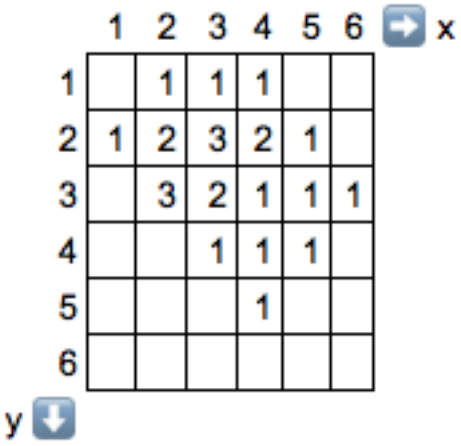
Two integers in one line, represent the maximum times they painted the same grid and the number of such grid.

Examples

standard input	standard output
6 6 4 2 2 1 2 3 1 3 2 0 3 4 2	3 2

Note

The sample looks like this. The "Manhattan distance" of two points A, B equals to $|A_x - B_x| + |A_y - B_y|$.



Problem G. Time Limit Exceeded

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	512 mebibytes

Everyone hates the verdict "Time Limit Exceeded"or “TLE”. However, sometimes, we can’t come up with a “elegant” solution which is clear and fast.

Our problem setter also hates “TLE”, but he is dumb and can only work out what a problem is. He can’t really solve it. We called him “Zui Qiang Xuan Shou”

One day, he got a problem, again, he said “I got it! It is ****”, he spoke so fast that no one knew what he said. Luckily, he typed his solution—

```
#include <stdio.h>
int main()
{
  int n;
  int *vec;
  scanf("%d", &n);
  vec = malloc(sizeof(int) * n);
  for (int i = 0; i < n; i++)
  {
    int t;
    scanf("%d", &t);
    vec.push_back(t);
  }
  long long ans = 0;
  for (int i = 0; i < n; i++)
    for (int j = 0; j < n - 1; j++)
      if (vec[j] > vec[j+1])
      {
        ans++;
        swap(vec[j], vec[j+1]);
      }
  printf("%lld\n", ans);
  return 0;
}
```

He said that it should get AC small cases, but he might receive "Time Limit Exceeded".

As he clicked the "submit"button, the network is down. So he went to the dinning hall and ask you to correct his solution.

Your program should output exact same things as the program listed above.

Input

The format of input should make the program work if we don’t care about the time.

In the input file, all numbers are positive integers and no more than 10^6.

Output

You should output what the program outputs if the time is unlimited.

Examples

standard input	standard output
5 1 2 3 4 5	0
6 1 2 3 4 5 6	0

Note

Why you need sample input and output? You can get them by compile and run the program above by yourself.

Problem H. Werewolf

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 mebibytes

Generally, ACMers play Werewolf game anywhere when they go out for any programming contests. There are several roles in this game, including werewolves, villagers, seer, witch, hunter, cupid

Here is the rule of the game:

The werewolves Each night the werewolves kill a player.

The villagers The villagers has no skills.

The seer Each night the seer can look at a card of a player of his choice to find out the real.

The hunter If the hunter gets killed, the hunter has the power to retaliate by killing a player of his choice immediately.

The cupid On the first night, cupid picks 2 players who he denotes as lovers. Those 2 players will fall madly in love with each another. If one of the lover dies, the other, out of sadness, dies immediately.

The witch The witch knows how to make up 2 extremely powerful potions. One healing potion, which can revive the player that has been killed by the werewolves. One poison potion, which when used at night can kill a player. The witch must use each potion only once during the game.

...

After each night, everyone wakes up, the god(game master) shows all players which player was killed during the night. After discussion, each player must select one player that they want to eliminate when they vote.

...

Generally, the werewolves do not select their teammates, but other roles do select anyone when voting. Here comes the problem. How many werewolves at most under the given voting case.

Input

The first line of input file consists of an integer $n(2 \leq n \leq 500000)$, the number of players.

The second line of input file consists of n integers, and the i-th number $x_i(1 \leq x_i \leq n, x_i \neq i)$ represents the number of the player selected by the i-th player.

Output

The output file should consist of only one integer, the maximum number of the existed werewolves.

Examples

standard input	standard output
3 2 3 2	2