oooooC

Input file:	`standard input`
Output file:	`standard output`
Time limit:	10 seconds
Memory limit:	256 megabytes

It's no secret that Stanley has lots of robot fans, "oooooC" means those robots' hands. One day when they were playing basketball, robot Todd sprained its ankle and came up with a new game named "basitball".

The rule of this game is simply to know, every robot sit on the floor and passing the ball to each other. You may wondered what will happen if the ball out of bound. Don't worry about it! Robot passing ball by extending its hands until touching the other, each robot can extend one 'o' in 1 unit time (e.g. "ooC" can be extended to "oooooC" after 3 unit times). Because each robot has its own tendency, it can passing the ball to "each other" which it wants. Now Todd want to know what's the minimum time it takes to let every robot touch the ball at least one time.

However, this problem is actually harder than it looks...

First, each robot r_i has its own mechanical code m_i when made. Mechanical code is a string consisting of characters '0', '1', due to some authors didn't want to reveal their mechanical code, the characters '?' will appear in the string, too.

Second, there are some anti-fans of Stanley, commonly known as "black-sh*t", which are robots as well. And one of their mechanical code's characteristic is that its longest palindromic sub-string has length of 5 or more.

Third, Stanley will ban all accounts (every robot use its account to watch Stanley's stream) which has any possibility to be a black-sh*t, which means they can not touch the ball in the entire game.

You may assume that a robot doesn't need any time to recover its hand, but every time when it want to pass a ball, it need to initiate its hand to "C".

You may assume that our holy lord Stanley can always ban all of the black-sh*t without any mercy.

Input

The first line of the input contains a single integer T ($1 \le T \le 20$). — the number of test case.

The first line of the test case contains two integer r, m ($1 \le r \le 10^3$, $m \le \min(\frac{r*r}{2}+1, 10^5))$ — the number of the robots in the game and the total tendencies of robots.

The next r lines of the test case contains a string m_i — the mechanical code of r_i. ($1 \le \text{len}(m_i) \le 20$)

Then m lines follow; the j-th of them contains three integers x_j, y_j and c_j ($1 \le x_j, y_j \le n$; $1 \le c_j \le 9$) — the tendency of r_x and r_y, and the cost time to pass a ball from r_x to r_y or from r_y to r_x.

It is guaranteed that the sum of r without black-sh*t in one test case do not exceed 20.

Output

For each test case,if there is no way to let every robot without black-sh*t play the game, print "Too ruthless! Stanley, you're really too ruthless!"

; Otherwise, print the minimum time.

Example

standard input	standard output
1 5 7 01??? 10111001 01??011111111 010?10 ?0111 1 3 5 2 1 6 3 4 2 5 1 3 2 4 9 2 5 1 3 2 1	0

Note

You can start the game with any player.