Problem I
In A Crazy City
Input: in.in

I live in a crazy city full of crossings and bidirectional roads connecting them. On most of the days, there will be a celebration in one of the crossings, that's why I call this city crazy.

Everyday, I walk from my home (at crossing *s*) to my office (at crossing *t*). I don't like crowds, but I don't want to waste time either, so I always choose a shortest path among all possible paths that does not visit the crossing of the celebration. If no such path exists, I don't go to work (it's a good excuse, isn't it)!

In order to analyze this "celebration effect" in detail, I need *n* pairs of values (l_i, c_i), where l_i is the length of the shortest path from crossing *s* to crossing *t*, not visiting crossing *i*, c_i is the number of such shortest paths (not visiting crossing *i*). Could you help me? Note that if I can't go to work when celebration is held at crossing *i*, define $l_i=c_i=0$. This includes the case when there is no path between *s* and *t* even if there's no celebration at all.

Ah, wait a moment. Please don't directly give me the values - that'll drive me crazy (too many numbers!). All I need is finding some interesting conclusions behind the values, but currently I've no idea what exactly I want.

Before I know what you should calculate, please **prove** that you can indeed find all the pairs (l_i, c_i) by telling me the value of $f(x) = (l_1+c_1x+l_2x^2+c_2x^3+l_3x^4+c_3x^5+\ldots+l_nx^{2n-2}+c_nx^{2n-1}) \bmod 19880830$, for some given *x*.

Input

There will be at most 20 test cases. Each case begins with 5 integers *n*, *m*, *s*, *t*, *q* ($1\le s,t\le n\le 100{,}000$, $0\le m\le 500{,}000$, $1\le q\le 5$). *n* is the number of crossings, *m* is the number of roads and *q* is the number of queries. *s* and *t* are different integers that represent my home and office, respectively. Each of the following *m* lines describes a road with three integers: *u*, *v*, *w* ($1\le u,v\le n$, $1\le w\le 10{,}000$), indicating a bidirectional road connecting crossing *u* and crossing *v*, with length *w*. There may be multiple roads connecting the same pair of crossings, but a road cannot be connecting a crossing and itself. The next line contains *q* integers x_i ($1\le x_i\le 10^9$). The last test case is following by five zeros, which should not be processed.

Output

For each test case, print the case number and *q* integers $f(x_1)$, $f(x_2)$, …, $f(x_q)$ separated by a single space between consecutive items, on one line. Print a blank line after the output of each test case.

Sample Input	Output for the Sample Input

<pre>4 5 1 4 2
1 2 1
1 3 1
2 4 2
3 4 3
1 4 4
1 10
3 2 1 3 1
1 2 12
2 3 2
1
0 0 0 0 0</pre>
	<pre>Case 1: 10 132400
	
	Case 2: 0</pre>

Explanation

In the first sample, $l_1=c_1=0$, $l_2=4$, $c_2=2$, $l_3=3$, $c_3=1$, $l_4=c_4=0$. In the second sample, everything is zero.