Problem C. Colored Graph

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	256 mebibytes

Consider a regular polygon (i. e. a polygon with all sides having the same length and all angles having the same value) with vertices numbered in clockwise order by integer numbers from 1 to N. Let its vertices correspond to vertices of a complete undirected graph, and its diagonals and edges correspond to edges of this graph. Also, each edge of this graph is colored either black or white.

Let's call a spanning tree of this graph valid if all its edges have the same color and no two of them intersect (except for inevitable intersections in vertices).

Given the coloring, find any valid spanning tree of this graph. The coloring of the edges is given in the following manner. Let the integer $C_{a,b}$ denote the color of the edge between a and b (0 means white, 1 means black, $C_{a,b} = C_{b,a}$). For some pairs (a, b) the color $C_{a,b}$ is given explicitly. The colors of all other edges can be found using the following formula:

$$C_{a,b} = \begin{cases} 0, & \text{if } (\min(a,b) \cdot X + \max(a,b) \cdot Y) \bmod Z < P_a + P_b \\ 1, & \text{otherwise} \end{cases}$$

where X, Y, Z and all P_i are given.

Input

The first line contains a single integer N ($3 \le N \le 5 \cdot 10^5$).

The second line contains the number of edges E ($0 \le E \le 2 \cdot 10^5$) of edges for which the color is given explicitly.

The next E lines contain three integers each: a, b, c ($1 \le a, b \le N$, $0 \le c \le 1$), which means that $C_{a,b} = c$.

The next line contains integers X, Y and Z. The next N lines contain integers P_i.

Here, $0 \le X, Y, P_i \le 10^{11}$; $1 \le Z \le 10^{11}$.

Output

Output $N - 1$ lines, describing the edges of a spanning tree. Each line should contain two integers — the vertices to connect with an edge. If no solution exists, just print "`No solution`". If multiple solutions exist, output any of them.

Examples

standard input	standard output
4 1 2 4 0 13 17 23 5 10 7 3	1 2 2 4 3 2