All-Star Showdown

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	1024 megabytes

In a bold departure from tradition, the Grand Contest this year will feature a special All-Star Showdown: a show match pitting two elite squads, Team Red and Team Blue, against each other in a head-to-head programming duel. Unlike the standard contest format, this match allows for flexible team sizes, as long as every contestant is assigned to exactly one team.

There are n all-star contestants selected from the hall of fame. Each contestant i is evaluated across three core dimensions: algorithmic insight, implementation speed, and debugging resilience. These attributes are quantified as positive integers (x_i, y_i, z_i), forming a 3D capability vector that captures their competitive profile. Additionally, each contestant i is assigned a positive integer synergy value w_i, reflecting their ability to amplify team performance. The overall team value of a squad is defined as the product of the synergy values of its members.

To maintain competitive integrity and prevent dominance by clusters of stylistically similar coders, the organizers enforce a strict diversity rule: within any single team, the Euclidean distance between the capability vectors of any two members must be at least d. Formally, for any two different contestants i and j in the same team, it must hold that $\sqrt{(x_i - x_j)^2 + (y_i - y_j)^2 + (z_i - z_j)^2} \geq d$. This ensures that each team comprises a well-rounded mix of problem-solving approaches.

The organizing committee wishes to analyze the combinatorial landscape of all valid assignments. Specifically, for each integer $k = 1, 2, \ldots, n-1$, they request the sum of the Team Red values over all valid partitions in which Team Red contains exactly k contestants.

Since the answers may be large, output them modulo 998 244 353.

Input

There is only one test case in each test file.

The first line contains two integers n and d ($2 \leq n \leq 10^5$, $1 \leq d \leq 10^8$).

For the following n lines, the i-th line contains four integers x_i, y_i, z_i, and w_i ($1 \leq x_i, y_i, z_i, w_i \leq 10^8$), indicating the capability vector and synergy value of contestant i.

Output

Output $(n-1)$ lines, where the i-th line contains an integer, indicating the sum of the Team Red values over all valid partitions in which Team Red contains exactly i contestants modulo 998 244 353.

Examples

standard input	standard output
3 1 1 1 1 1 1 2 1 10 1 2 3 100	111 1110
3 2 1 1 1 1 1 2 1 10 1 2 3 100	11 1100
3 2 2 1 1 1 1 2 1 10 1 1 2 100	0 0