



Safe Places

Input: Standard Input
Output: Standard Output



There are n kinds (i.e. type-1, type-2, ..., type- n) of m satellites in the space. For each $1 \leq i \leq n$, all the type- i satellites are working together to protect their minimal enclosing convex polyhedron (though its volume might be zero). If a point is protected by at least k kinds of satellites, we say this point is safe.

Find the volume of all safe places (it might be zero).

Input

The first line contains T ($T \leq 25$), the number of test cases. Each test case begins with three integers n , k and m ($1 \leq k \leq n \leq 5$, $4 \leq m \leq 50$). Each of the following m lines contains an integer t and three **real numbers** x, y, z , representing a type- t satellite at (x, y, z) ($1 \leq t \leq n$, $0 \leq x, y, z \leq 10$). Each test case is terminated by a blank line

Note: The coordinates of satellites in the judge input (not sample input) are randomly generated.

Output

For each test case, print the volume rounded to 5 decimal places after the decimal point.

Sample Input

Output for Sample Input

2	15.00000
2 1 16	0.16667
1 0 0 0	
1 0 0 2	
1 0 2 0	
1 0 2 2	
1 2 0 0	
1 2 0 2	
1 2 2 0	
1 2 2 2	
2 1 1 1	
2 1 1 3	
2 1 3 1	
2 1 3 3	
2 3 1 1	
2 3 1 3	
2 3 3 1	
2 3 3 3	
1 1 4	
1 0 0 0	
1 0 1 0	
1 0 0 1	
1 1 0 0	