UVa Online Judge

12513 Safe Places

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

```
2
2 1 16
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
```

Sample Output

```
15.00000
0.16667
```