3D Cover

In the 3D Cartesian coordinate system, there are n cubes. These cubes are all axis-paralleled. What's the volume of the union of these cubes?

Input

There is a single integer m in the very first line of the input, the number of test cases. m blocks follow.

For each test, the first line contains a single integer n (1<=n<=100), the number of cubes. n lines follow, each contains four integers x, y, z, r (-1000 <= x, y, z <=1000,1 <= r <= 200), separated by spaces. x, y, z are the X, Y, Z coordinates of the center of the cube, and r is the distance between the center and any surface of the cube.

Output

m lines, each contains a single integer - the answer.

Example

Sample Input:

Sample Output:

1944