Cracking Coconuts

You and your best friend are taking a cruise. Chillin, relaxin, being all cool. When all of a sudden, a large wind tips the ship over a little more than you two can handle, and you fall overboard. Nobody sees you, so they never turn around. Fortunately, you were pretty close to a beautiful tropical island!

After swimming to the island and getting over the shock of the situation, your friend gets thirsty. "Let's find something to drink. Oh look, a coconut!"

Your friend bashes it against a tree, stomps on it, and even tried biting it once. The genius you are, you give your friend a rock, and say "Use this..." Obviously, your friend tries every which way to crack it open with the rock you found, but it isn't very sharp. Luckily enough, you waterproofed your phone before leaving, so you decide to go ahead and find a bunch of rocks, and figure out which one is the sharpest. I only give my friend convex rocks, because everyone knows concave rocks are more brittle and break easier.

We will define sharpest as the following: a rock is as sharp as its sharpest point. We calculate the sharpness of a point by averaging all adjacent angles to the edges connected to that point. For example, if we are dealing with a unit cube (all side lengths are 1), and we pick any corner as a point, then there are three connected edges to that point. Then, there are also three angles, one between the x and y edges, one between the y and z edges, and one between the z and x edges (all 90 degrees). The average of these angles makes the sharpness 90 at that point. If we take this cube and cut in in half along a diagonal, and use the point at a cut, then we will still have two 90 degree angles, but one that is 45, so the average becomes 75. By this definition, the closer to 0, the sharper the point is. Given a set of points for a rock, determine its sharpness. We all know you can figure out the sharpest from there!

Input

Input begins with a single number, R, the number of rocks to examine. For each rock, there will be a line with a single integer, P ($4 \leq P \leq 100000$). Following this will be P lines containing the points of the rock. Each coordinate will be given in three space-separated floating point numbers to no more than 3 decimal places and $-100.000 \leq x \leq 100.000$.

Output

For each rock, output the rock's sharpness on a single line, rounded to 4 decimal places.

Sample Input

2

8

0 0 0

0 0 1

0 1 0

0 1 1

1 0 0

1 0 1

1 1 0

1 1 1

8

0 0 0

0 0 1

0 1 0

1 0 0

0 1 1

1 0 1

0.333 0.333 0.333

0.111 0.111 0.111

Sample Output

90.0000

75.0000