

C. Shooting Gallery

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

One warm and sunny day king Copa decided to visit the shooting gallery, located at the Central Park, and try to win the main prize — big pink plush panda. The king is not good at shooting, so he invited you to help him.

The shooting gallery is an infinite vertical plane with Cartesian coordinate system on it. The targets are points on this plane. Each target is described by its coordinates x_i , and y_i , by the time of its appearance t_i and by the number p_i , which gives the probability that Copa hits this target if he aims at it.

A target appears and disappears instantly, so Copa can hit the target only if at the moment t_i his gun sight aimed at (x_i, y_i) . Speed of movement of the gun sight on the plane is equal to 1. Copa knows all the information about the targets beforehand (remember, he is a king!). He wants to play in the optimal way, which maximizes the expected value of the amount of hit targets. He can aim at any target at the moment 0.

Input

The first line contains integer n ($1 \leq n \leq 1000$) — amount of targets in the shooting gallery. Then n lines follow, each describing one target. Each description consists of four numbers x_i, y_i, t_i, p_i (where x_i, y_i, t_i — integers, $-1000 \leq x_i, y_i \leq 1000, 0 \leq t_i \leq 10^9$, real number p_i is given with no more than 6 digits after the decimal point, $0 \leq p_i \leq 1$). No two targets may be at the same point.

Output

Output the maximum expected value of the amount of targets that was shot by the king. Your answer will be accepted if it differs from the correct answer by not more than 10^{-6} .

Examples

input
1 0 0 0 0.5
output
0.5000000000

input
2 0 0 0 0.6 5 0 5 0.7
output
1.3000000000