# 4 Photographer

4.1 Problem

A photographer stands in the origin of a two-dimensional world and looks along the positive x-axis. People stand at different positions $(x, y) \in \mathbb{N} \times \mathbb{Z}$ of the half-plane the photographer is facing.

Your task is to write a caption of the image the photographer is taking. You are to name all the people in left-to-right-order (by angle) of their position in the image (where $(0, 1)$ is to the left of the photographer, $(0, -1)$ is to his right and he looks in direction $(1, 0)$). If two people are standing directly behind one another, you are to name the one that is nearer to the camera first.
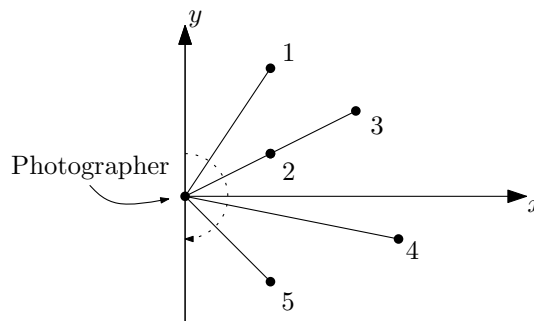
4.2 Input

The input contains up to 100000 lines, each of which contains a string n and two integers $0 < x < 10000$ and $-10000 < y < 10000$. The string n is the name of a person and will not contain spaces. The integers x and y denote the position of this person in the plane.

4.3 Output

Output the names of all the people in the input in the order they should appear in the caption. Output an end-of-line character after each name.

4.4 Sample Data

Input	Output
Erwin 6 0 Heinz 2 −1 Ernst 3 3 Horst 1 3 Fritz 2 −4 Bernd 4 −2	Horst Ernst Erwin Heinz Bernd Fritz