# APIO '18 P2 - Circle Selection

Time limit: 1.4s   **Memory limit:** 1G

Given n circles $c_1, c_2, \ldots, c_n$ on a flat Cartesian plane. We attempt to do the following:

1. Find the circle c_i with the largest radius. If there are multiple candidates all having the same (largest) radius, choose the one with the smallest index. (i.e. minimize i).

2. Remove c_i and all the circles intersecting with c_i. Two circles intersect if there exists a point included by both circles. A point is included by a circle if it is located in the circle or on the border of the circle.

3. Repeat 1 and 2 until there is no circle left.
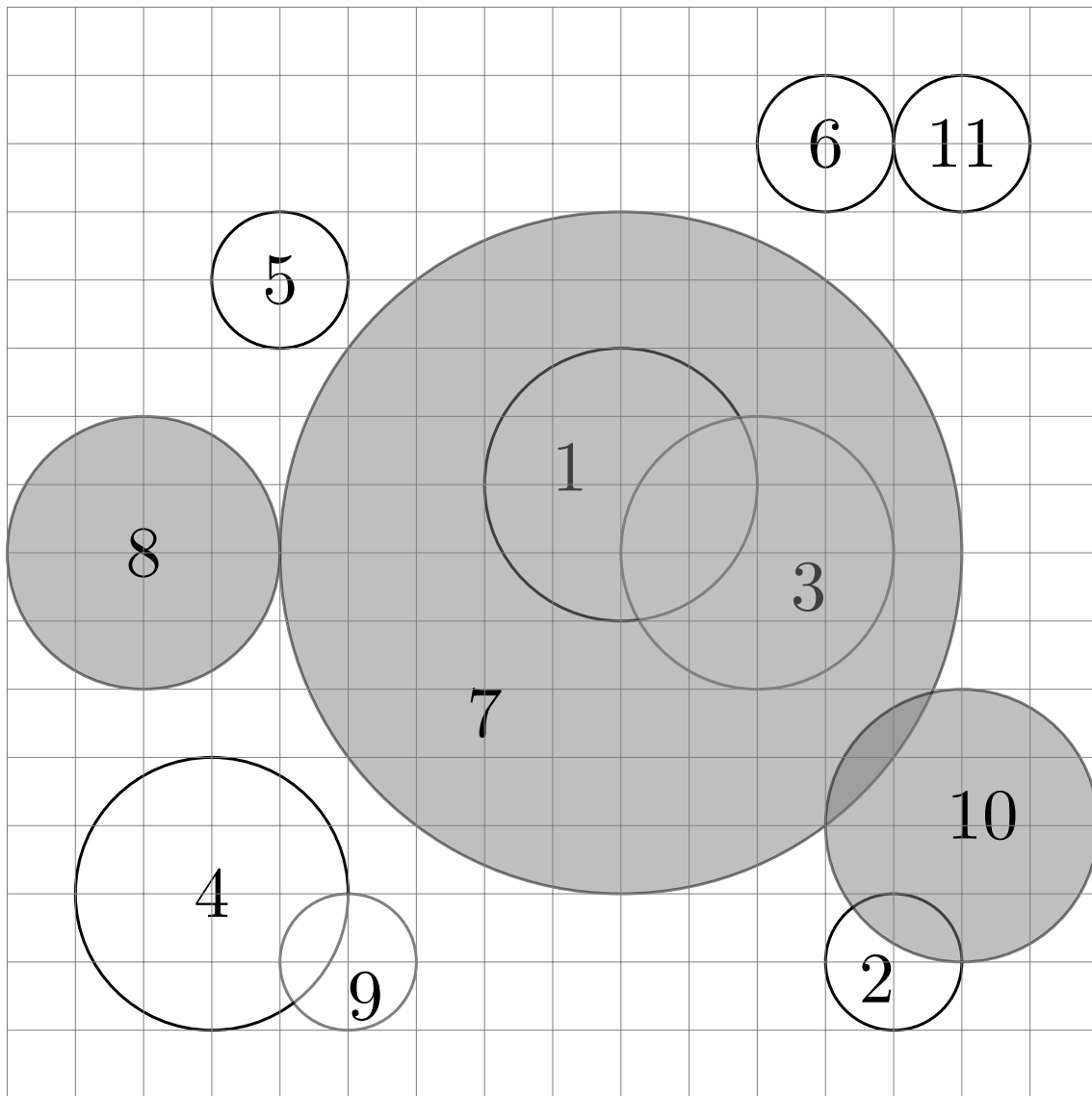
We say c_i is eliminated by c_j if c_j is the chosen circle in the iteration where c_i is removed. For each circle, find out the circle by which it is eliminated.

Input

The first line contains an integer n, denoting the number of circles $(1 \leq n \leq 3 \cdot 10^5)$. Each of the next n lines contains three integers x_i, y_i, r_i, representing the x-coordinate, the y-coordinate, and the radius of the circle c_i $(-10^9 \leq x_i, y_i \leq 10^9, 1 \leq r_i \leq 10^9)$.

Output

Output n integers $a_1, a_2, \ldots, a_n$ in the first line, where a_i means that c_i is eliminated by c_{a_i}.

Scoring

Subtask 1 (points: 7)

$n \leq 5\,000$

Subtask 2 (points: 12)

$n \leq 3 \cdot 10^5$, $y_i = 0$ for all circles

Subtask 3 (points: 15)

$n \leq 3 \cdot 10^5$, every circle intersects with at most 1 other circle

Subtask 4 (points: 23)

$n \leq 3 \cdot 10^5$, all circles have the same radius

Subtask 5 (points: 30)

$n \leq 10^5$

Subtask 6 (points: 13)

$n \leq 3 \cdot 10^5$

Sample Input

```
11
9 9 2
13 2 1
11 8 2
3 3 2
3 12 1
12 14 1
9 8 5
2 8 2
5 2 1
14 4 2
14 14 1
```

Sample Output

```
7 2 7 4 5 6 7 7 4 7 6
```

Note

The picture in the statements illustrates the first example.