

## Perfect Slice

Computer Science Society  
Programming Contest  
Winter 2009

It's customary to eat pizza after programming contests, and pepperoni is a beloved choice, but a slice of pepperoni pizza isn't perfect unless every pepperoni on it is perfectly round. In this problem, we are given the placement of two round pepperonis on a whole pizza, and must determine whether it is possible to make a perfect slice—a straight radial slice emanating from the center of the pizza that avoids cutting either pepperoni, and perfectly bisects the angle emanating from the center of the pizza between and tangent to each pepperoni.

### *Input Format*

Each line of input describes a pair of round pepperonis on a whole (uncut) pizza. Each pepperoni is described by two real numbers  $x$  and  $y$  giving the Cartesian coordinates  $(x, y)$  of the center of the pepperoni, and a positive real number  $r$  giving the radius of the round pepperoni. The two pepperonis are placed on a whole pizza whose center is at Cartesian coordinate  $(0, 0)$  (and whose radius is irrelevant).

### *Output Format*

For each pair of pepperonis in the input, determine whether it is possible to make a perfect slice. If one of the pepperonis covers or touches the center of the pizza, it is not possible to make a perfect slice. If there is no straight radial slice emanating from the center of the pizza that goes between the pepperonis without cutting or being tangent to one of them, it is not possible to make a perfect slice. Otherwise, report the angle in degrees of the perfect slice. The angle of the positive  $x$ -axis is considered 0 degrees, with positive angles counterclockwise from there and negative angles clockwise from there. Slice angles should be reported in degrees between 180 and -180 and accurate to two decimal places.

### *Input Sample*

```
10 10 5    1  2 3
10 10 1   -10 10 1
19  6 3    7 12 4
 5  5 3    8 12 1
10 10 1    0 -10 1
12.2 5.1 3.4  16.1 -3.4 2.9
```

### *Output Sample*

```
center covered
slice at 90.00 degrees
slice at 36.73 degrees
no slice between them
slice at -21.66 degrees
slice at 3.89 degrees
```