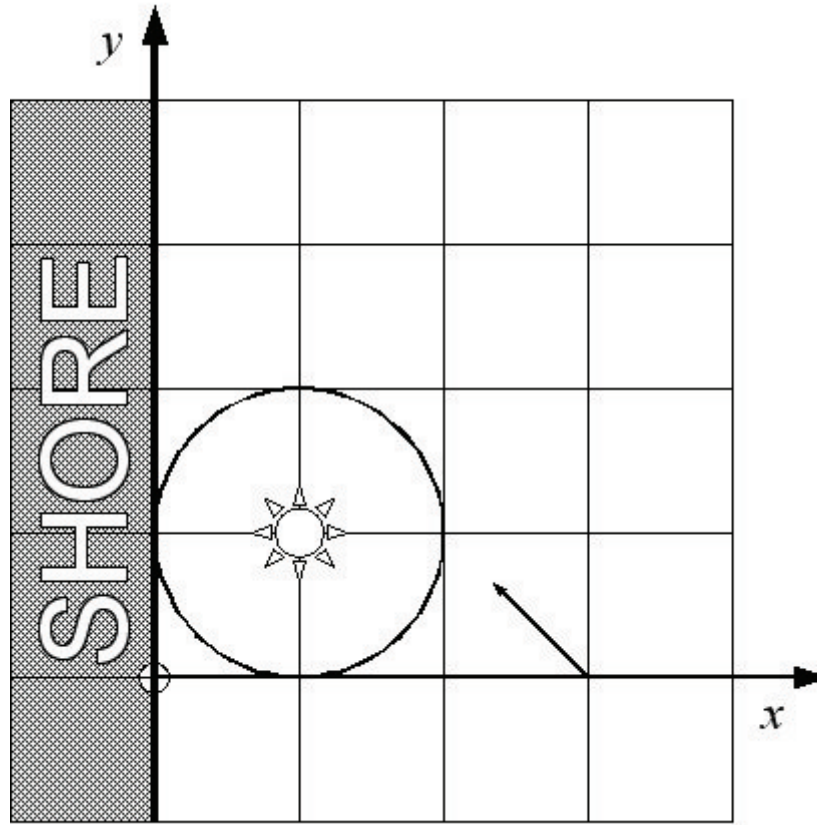


Program Name: look.java

Input File: look.in

You are piloting a boat at night through unknown waters. There is only one lighthouse, and to survive you have to find the lighthouse before you hit the shore. Since you don't know exactly where the shore is, you decide to just steer straight and let fate decide the outcome.



Write a program that, given the location of the lighthouse and the path of the boat, will determine whether or not the ship lands safely, sunders its hull on the shoals, or is lost at sea.

The entire scenario takes place in the  $x,y$  coordinate plane, with the positive  $x$ -axis pointing east and the positive  $y$ -axis pointing north. The shore line is the  $y$ -axis ( $x = 0$ ), with the ocean on the positive  $x$  side. The lighthouse is in a stationary position, given as an  $(x,y)$  coordinate pair, and its light is visible to anyone at or within  $r$  nautical miles. Your boat has a starting position, given as another  $(x,y)$  coordinate pair, and a heading that is given in degrees. The heading is measured as an angle counter-clockwise from the positive  $x$ -axis (i.e., 0 degrees is east, 90 degrees is north, 180 degrees is west, and 270 degrees is south).

### Input

The first line of input will contain a single integer,  $n$ , indicating the number of data sets to process. The remainder of the input consists of those  $n$  data sets.

Each data set consists of a single line with six integers, separated by spaces ( $lx\ ly\ r\ bx\ by\ h$ ). The pair  $(lx, ly)$  is the position of the lighthouse, and  $r$  is the distance from the lighthouse at which the light can be seen. The pair  $(bx, by)$  is the starting position of the boat, and  $h$  is the boat's heading.

The boat's starting position will always be in the water (i.e.,  $bx > 0$ ), but the lighthouse can be anywhere.

### Output

For each data set in the input print a single line depending on which of the three possible outcomes applies. The three possible outcomes are:

1. The boat never hits the shore and never sees the light from the lighthouse. Print "Lost at sea".
2. The boat hits the shore before, if ever, seeing the lighthouse. Print "Look out!".
3. The boat sees the lighthouse before, if ever, hitting the shore. Print "Saved by the lighthouse".

If the boat sees the lighthouse at the same time that it hits the shore, it's too late to change course and outcome #2 applies ("Look out!").

The diagram shown at the start of the problem depicts the third data set.

### Example Input File

```
5
0 0 5 10 0 180
0 0 5 10 0 270
1 1 1 3 0 135
0 1 1 3 0 135
0 0 2 1 3 225
```

### Example Output To Screen

```
Saved by the lighthouse
Lost at sea
Saved by the lighthouse
Look out!
Look out!
```