Problem F. Safe Flight

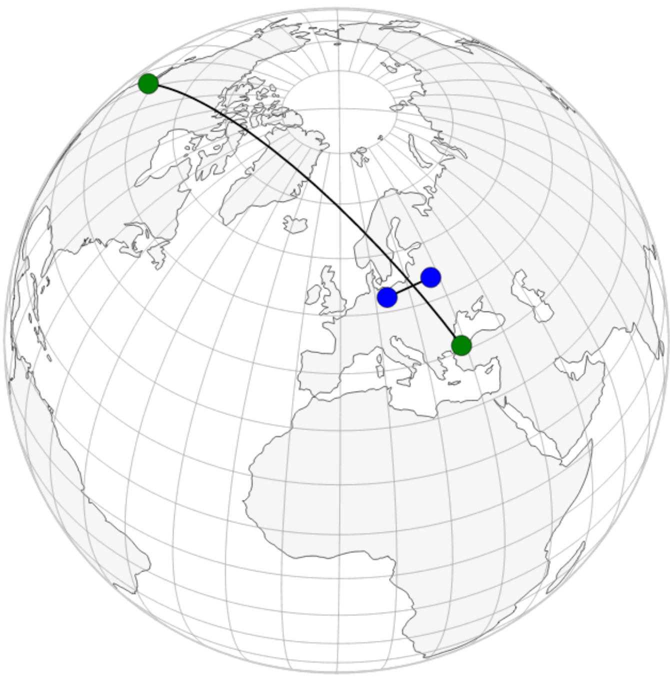
Input file:	`flight.in`
Output file:	`flight.out`
Time limit:	1 second
Memory limit:	256 mebibytes

Employees of the international company Yandex often have to fly on business trips between different offices of the company. And, of course, it is impossible to think only about work in the sky, so they discuss everything that they see around.

Ivan and Simon wondered how safe it is actually to travel by plane, because a huge number of flights are being performed at the same time. Of course, air traffic controllers maintain the safe, orderly and expeditious flow of air traffic and prevent aircraft collisions. Nevertheless, an interesting math problem was revealed.

You are given the coordinates of the cities of departure and arrival for two flights. Determine whether the routes of the aircrafts cross or not.

In this problem, we assume that the Earth is a unit sphere, and the planes fly by the shortest route.



Input

The first line of input contains the number T ($1 \le T \le 1000$) of test cases. Each of the next T lines describes one test case. Each test case sets positions of start and finish points for the first and the second flight.

A point is specified using two consecutive numbers: latitude and longitude (angles measured in degrees). Latitude is the geographic coordinate that specifies the north-south position of a point on the Earth's surface. The equator has a latitude of 0°, the North Pole has a latitude of +90°, and the South Pole has a latitude of −90°. Longitude specifies the east-west position of a point on the Earth's surface. The Prime Meridian, which passes through Greenwich, establishes the position of 0° longitude. The longitude of other places is measured as the angle east or west from the Prime Meridian, ranging to −180° westward (inclusive) and to +180° eastward (exclusive).

Hence, each line specifying a test case contains eight real numbers $\text{lat}_{1,s}$, $\text{lon}_{1,s}$, $\text{lat}_{1,f}$, $\text{lon}_{1,f}$, $\text{lat}_{2,s}$, $\text{lon}_{2,s}$, $\text{lat}_{2,f}$ and $\text{lon}_{2,f}$ separated by single spaces, where $-90 \le \text{lat}_{i,s}, \text{lat}_{i,f} \le 90$ and $-180 \le \text{lon}_{i,s}, \text{lon}_{i,f} < 180$

for $i \in \{1, 2\}$ which denote the flight number; s stands for start and f stands for finish. All the numbers are given with no more than three digits after the decimal point. Exponential notation is not allowed.

It is guaranteed that the departure and arrival cities are not located at diametrically opposite points and do not coincide.

All test cases satisfy the following condition: the distance on the sphere between flight trajectory and departure and arrival city of other flight is at least 10^{-7}.

Output

For each test case, print a single line. Write `DANGER` if the routes cross, or `SAFELY` otherwise.

Example

flight.in
2 53.906 27.555 52.516 13.377 41.009 28.967 47.679 -122.132 21.286 -156.602 21.092 121.245 -17.136 49.591 -33.542 116.474
flight.out
DANGER SAFELY

Note

Consider the first example. The first aircraft operates a short-haul flight from Minsk (Belarus) to Berlin (Germany), and the second wide-body airliner makes a transatlantic flight from Istanbul (Turkey) to Redmond (USA). The flight paths cross in the sky over Poland.

The second test case describes two airliners, one flying over the Pacific Ocean, the other flying over the Indian Ocean. So they are never close.