Problem 34: GCAS

Difficulty: Medium

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Problem Background

Pilots have a lot to think about! In order to make their job a bit easier, you have been tasked to develop a "Ground Collision Avoidance System" (GCAS) for the brand new F-X program. This system is responsible for providing an audible warning to the pilot if they are in danger of colliding with the ground. To do this, the GCAS maintains digital maps of terrain data and predicts the aircraft's flight path.

Problem Description

As soon as the aircraft takes off, the GCAS becomes active. Your program will be responsible for reading sensor data containing the current altitude of the aircraft as well as the ground elevation along the aircraft's current path. You will use this data to decide how the GCAS will interact with the pilot.

The GCAS is a predictive tool – meaning it can't know what the pilot intends to do in the next time unit. Therefore, its best guess is to calculate the change in altitude that the aircraft experienced in the current time unit and assume that the same change will happen in the next time unit.
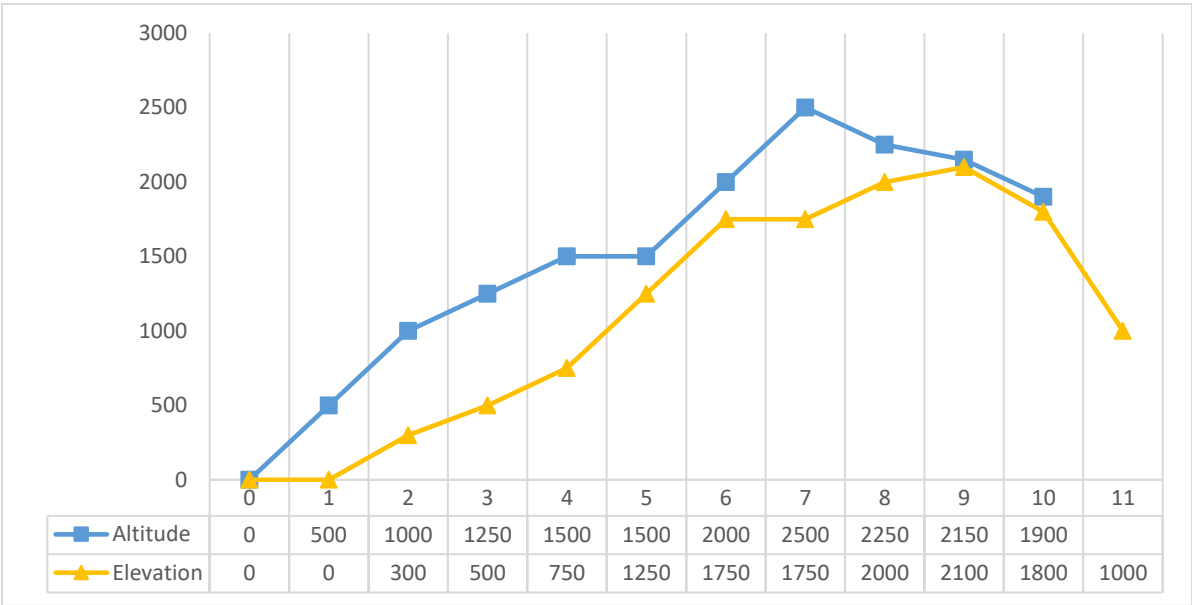
The GCAS should work like this:

- If the system thinks that the aircraft will crash in the next time unit, it should print "PULL UP!"
- If the system does not anticipate a crash but the aircraft is 500 ft. or less above the current ground elevation, it should print "Low Altitude!"
- If the system does not anticipate a crash and the aircraft has more than 500 ft. of altitude above the current ground elevation, it should print "ok".

Sample Input

The first line of your program's input, received from the standard input channel, will contain a positive integer representing the number of test cases. Each test case will include:

- A positive integer **N** representing how long the flight is in time units.
- **N** lines, each containing the current altitude of the plane as well as the next time unit's ground elevation separated by a comma.
- The aircraft has 0 altitude at takeoff, and the ground elevation at takeoff and in the first time unit is 0. You will need these values for your calculations in the first time unit. Remember that your program will be reading current altitude but future ground elevation.

```
1
10
500,300
1000,500
1250,750
1500,1250
1500,1750
2000,1750
2500,2000
2250,2100
2150,1800
1900,1000
```

	0	1	2	3	4	5	6	7	8	9	10	11
Altitude	0	500	1000	1250	1500	1500	2000	2500	2250	2150	1900	
Elevation	0	0	300	500	750	1250	1750	1750	2000	2100	1800	1000

Graph of Example Data

Sample Output

For each of the N time units in the aircraft's flight, the GCAS should print one of the following lines according to the rules given above:

- PULL UP!
- Low Altitude!
- ok

```
Low Altitude!
ok
ok
ok
PULL UP!
Low Altitude!
ok
PULL UP!
Low Altitude!
Low Altitude!
```