Scheduling Deliveries, v2015
Released: Wednesday, 19 August 2015, 11.45am
Due: Saturday, 29 August 2015, 07.59am

The Actual Problem Description

Given the names of **N** pregnant women that are about to give birth, their initial dilation status (in millimeters), and subsequent updates of their dilation status, determine which woman that the only doctor on duty has to give his/her most attention to.

A woman with higher dilation status has higher priority. If there are more than one woman with the same highest dilation status, this only doctor will give priority to the woman who arrived at the hospital earlier.

You just need to implement four more methods/functions:

1. void ArriveAtHospital(String womanName, int dilation)

    Insert this womanName and her initial dilation upon arrival at hospital into a suitable data structure of your choice.

    WomanName is a String that contains only uppercase alphabets with length between 1 to 15 characters.

    The women names are all unique.

    Dilation is an integer between [30..100].

2. void UpdateDilation(String womanName, int increaseDilation)

    Medically, dilation can only go up to around dilation = 100 millimeters and our test data will ensure that this method will not cause a womanName to have dilation status greater than 100.

    What we guarantee is that increaseDilation is an integer between [0..70] and before calling this method, womanName has arrived at the hospital.

3. void GiveBirth(String womanName)

    Medically, it takes several minutes or even hours from dilation around 100 millimeters until the baby is actually born.

    Some mothers can actually deliver the baby even if her dilation is still less than 100 millimeters (but it is not an ideal situation).

    Again, to simplify this problem, we assume that upon calling this method, the womanName gives birth in 'that instant' and no longer need to be taken care by the only doctor on duty.

    We guarantee that before calling this method, womanName has arrived at the hospital.

4. String Query() Query your data structure and reports the name of the woman that the only doctor on duty has to give the most attention to.

See the priority criteria defined above.

If there is no more woman to be taken care of, return a String: "The delivery suite is empty".

Example:

Let the chronological sequence of 15 events are as follows:

1. ArriveAtHospital("GRACE", 31)
2. ArriveAtHospital("ASTRID", 55)
3. ArriveAtHospital("MARIA", 42)
4. Query()

   You have to print out "ASTRID", as she is currently the one with the highest dilation.

   To be precise, at the moment the order is: (ASTRID, 55), (MARIA, 42), (GRACE, 31).
5. ArriveAtHospital("CINDY", 77)
6. Query()

   Now you have to print out "CINDY".

   The current order is: (CINDY, 77), (ASTRID, 55), (MARIA, 42), (GRACE, 31).
7. UpdateDilation("GRACE", 24)

   After this event, the one with the highest dilation is still CINDY with dilation = 77.

   "GRACE" now has dilation = 31+24 = 55, but this is still 22 millimeters smaller than "CINDY".

   Note that "ASTRID" also has dilation = 55 but "GRACE" is in front of "ASTRID" because "GRACE" arrived at the hospital earlier.

   The current order is: (CINDY, 77), (GRACE, 55), (ASTRID, 55), (MARIA, 42).
8. GiveBirth("CINDY")

   "CINDY" now gives birth 'instantly', and she is no longer in the doctor's radar.
9. Query()

   Now you have to print out "GRACE", as the current order is: (GRACE, 55), (ASTRID, 55), (MARIA, 42).
10. GiveBirth("MARIA")

    Suddenly "MARIA" reaches dilation 100 millimeters and gives birth instantly.
11. Query()

    The answer is still: "GRACE".

    The current order is: (GRACE, 55), (ASTRID, 55).

12. GiveBirth("GRACE")
13. Query()
    You have to answer: "ASTRID".
    The current order is: (ASTRID, 55).
14. GiveBirth("ASTRID")
15. Query()
    You have to answer: "The delivery suite is empty".

Constraints

Time Limit: 1s.

We make things very easy for you: The number of women involved in this Subtask A is at least 1 and at most 10.

The Sample Input/Output below is exactly the same as the illustration above. Notice that there are only 4 different women involved in this sample test case. In our actual test case, we have a few more women with various ArriveAtHospital/UpdateDilation/GiveBirth/Query combinations.

Sample Input

```
15
0 GRACE 31
0 ASTRID 55
0 MARIA 42
3
0 CINDY 77
3
1 GRACE 24
2 CINDY
3
2 MARIA
3
2 GRACE
3
2 ASTRID
3
```

Sample Output

```
ASTRID
CINDY
GRACE
GRACE
ASTRID
The delivery suite is empty
```