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# Punch-In/Out

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Problem

Submissions

Discussions

Time Limit: C/C++ (1s), Java (2s)

Memory Limit: 512MB

In FRBD (Fun Research & Development Institute Bangladesh), employees follow a complex but fun office in-out system. An employee starts the office with the first punch-in through the system and ends the office with the last punch-out.

During the day, an employee can punch in or out an unlimited number of times. The employee is inside the office after a punch-in until the next punch-out. This time is measured as  $punch\_out\_time - punch\_in\_time$ . The total duration while the employee is inside the office is known as the W does not count even if the employee is inside that are described later.

The Working Day D is a metric that is measured based on W and some in-out system rules, then assigned to the employee on that day. Possible values of D are - "Overtime", "Full Day", "1st Half", "2nd Half" and "Absent".

Firstly, there are some hourly requirements for the values of  $oldsymbol{D}$ .

- Overtime:  $W \geq 12$  hours.
- Full Day:  $W \geq 8$  hours.
- 1st or 2nd Half: W>4 hours. (2nd Half is only considered when 1st half is not applicable)

The punch system is as followed.

- Employees can punch in or out between 00:00 to 23:59.
- It's not possible to punch in and out simultaneously at the same minute.
- Punch out at 00:00 is a special case, considered the last punch of the previous day. (see *sample* for more clarity)

The working hour W is calculated with these rules.

- W count starts from 07:00, even if there are earlier punches.
- The first punch-in of the day after 11:00 loses the 1st Half (along with Overtime or Full Day): W does not start count until the 2nd Half starts from 14:00.
- ullet The lunch hour is from 13:00 to 14:00 and W does **not** count during this time.

An employee will be considered *Absent* if any of the following is true:

- The first punch-in of the day is after 15:00
- ullet W < 4 hours or there is no punches throughout the day
- ullet None of the other values of *Working Day oldsymbol{D}* is possible

Finally, the special Late case is applicable when the employee is not Absent:

- For Full Day, 1st Half or Overtime: The first punch-in of the day after 10:30 causes Late.
- For 2nd Half. The first punch-in of the day after 14:30 causes the Late.

Now, your task is to determine the  $\mathit{Working}\ \mathit{Day}\ D$  based on the in-out system rules mentioned above.

## **Input Format**

Input starts with an integer T, denoting the number of test cases.

Each case contains a non-negative integer N, denoting the number of punch-in or out on a single day.

Each of the following N lines contains a space-separated special character '>' or '<', and a timestamp in HH:MM format.

- '>' denotes the punch-in and '<' denotes the punch-out.
- The first input is punch-in and the last input is punch-out.
- Punch-in and punch-out inputs are given alternatingly and chronologically.

Please check the samples for a better understanding.

#### Constraints

 $1 \le T \le 100$ 

 $0 \le N \le 100$ 

 $00 \le HH \le 23$ 

 $00 \le MM \le 59$ 

### **Output Format**

For each case, print the value of D.

Add a space-separated special character ' $\sim$ ' at the end of  $m{D}$  (except for "Absent"), in case of Late.

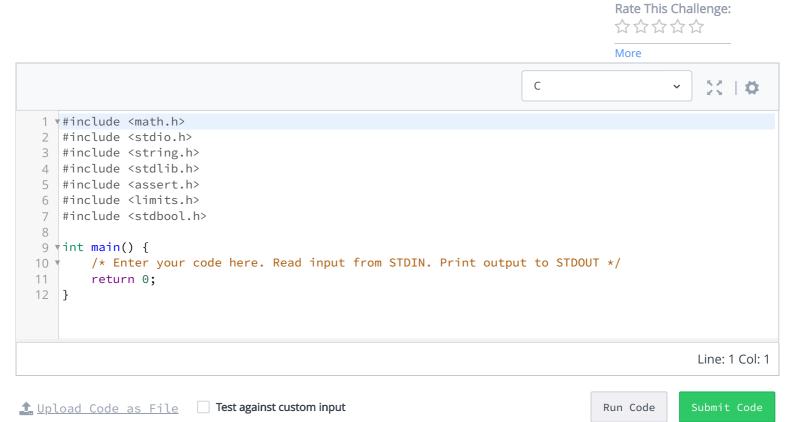
Please check the samples for a better understanding.

## Sample Input 0

```
5
2
> 00:00
< 00:00
> 11:00
< 13:30
> 14:00
< 19:30
> 07:00
< 07:01
> 14:00
< 22:00
2
> 11:30
< 00:00
> 15:30
< 19:30
```

### Sample Output 0

Overtime
1st Half ~
Full Day
2nd Half
Absent



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