Problem 221: Time Is in Your Hands

Difficulty: Hard

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Originally Published: Code Quest 2023

Problem Background

With a global company like Lockheed Martin, we have employees scattered around the globe. Of course, we want to use the best people on each team to provide the best skills for our customers. As such, you could have team members in various locations around the world that need to meet virtually.

Lockheed Martin is hiring you to develop a scheduling application. Following agile development methods, you'll work towards smaller goals over the course of several short "sprints," gradually building up to a fully functional application. For your first sprint, your goal is to determine the local time for various members of a team.

Problem Description

For this problem, you'll be focused on an international team of eight members, listed below.

Name / Location	Time Zone	DST Starts	DST Ends
Elizabeth **Smith** Phoenix, AZ, USA	Arizona Time (UTC-7)	Not observed	Not observed
Jane **Sprey** Bethesda, MD, USA	Eastern Standard Time (UTC-5)	02:00, second Sunday of March	02:00, first Sunday of November
Freya **Anderson** Edinburgh, Scotland, UK	Greenwich Mean Time (UTC+0)	01:00, last Sunday of March	02:00, last Sunday of October
Alika **Bolade** Lagos, Nigeria	West Africa Time (UTC+1)	Not observed	Not observed
Ahmed **Hassan** Cairo, Egypt	Eastern European Time (UTC+2)	Not observed	Not observed
Sri **Agarwal** Mumbai, India	Indian Standard Time (UTC+5½)	Not observed	Not observed
Haruki **Sato** Tokyo, Japan	Japan Standard Time (UTC+9)	Not observed	Not observed
Rick **Thomas** Melbourne, VIC, Australia	Australian Eastern Std. Time (UTC+10)	02:00, first Sunday of October	03:00, first Sunday of April

All time zones are defined with an offset in hours from Universal Coordinated Time, or UTC. Converting between time zones is done by combining the offsets of both time zones and adding that

number to the time; for example, when it's midnight (00:00) in Bethesda (UTC-5), it's 10:30 in Mumbai (UTC+5½).

Certain time zones also observe Daylight Savings Time (DST) during the summer months. This adds an additional offset of UTC+1 to that time zone during the specified period. For example, in December, Melbourne has an offset of UTC+11, not UTC+10. This shift comes into effect immediately at the stated time and date; when DST starts in Edinburgh, the time jumps directly from 00:59 to 02:00; when it ends, it reverts from 01:59 back to 01:00 (causing 01:00 to occur twice that day).

For each meeting you'll be asked to schedule, you'll be given a team member's name, when they want to meet (in their local time), and with whom they want to meet. Then, for each of those people, you'll need to report their local time so they know when the meeting is. You'll have to compute the time across those different time zones, and will need to account for DST if it applies for a team member's location and time of the year.

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 single line of text, containing the following information, separated by spaces:

- The last name (surname) of the meeting organizer, as shown in **bold text** in the table above.
- The date of the meeting in the organizer's local time, expressed in YYYY-MM-DD format. All dates will be Saturday, January 1, 2022 or later.
- The time of the meeting in the organizer's local time, expressed in 24-hour HH:MM format.
- A list of one or more additional last names (surnames), indicating the desired meeting attendees. Names will be listed in alphabetical order and will appear as shown in **bold text** in the table above.

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2
Sprey 2022-03-14 09:00 Agarwal Anderson Bolade Hassan Sato Smith Thomas
Sato 2022-03-29 15:45 Agarwal Anderson Bolade Hassan Thomas
```

Sample Output

For each test case, your program must print output in the following format:

- A line containing the phrase "<Organizer>'s Meeting:", replacing <Organizer> with the last name (surname) of the meeting organizer
- One line for each person attending the meeting, including the meeting organizer, listed in alphabetical order by last name (surname). Each line should include the following information, separated by spaces:
    - The last name (surname) of the attendee
    - The date of the meeting in the attendee's time zone, in YYYY-MM-DD format

- The time of the meeting in the attendee's time zone, in 24-hour HH:MM format

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Sprey's Meeting:
Agarwal 2022-03-14 18:30
Anderson 2022-03-14 13:00
Bolade 2022-03-14 14:00
Hassan 2022-03-14 15:00
Sato 2022-03-14 22:00
Smith 2022-03-14 06:00
Sprey 2022-03-14 09:00
Thomas 2022-03-15 00:00
Sato's Meeting:
Agarwal 2022-03-29 12:15
Anderson 2022-03-29 07:45
Bolade 2022-03-29 07:45
Hassan 2022-03-29 08:45
Sato 2022-03-29 15:45
Thomas 2022-03-29 17:45
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