Coding Area

05Hr 41Min 35Sec

Your Contest Ends At
2022-03-12 01:19:46 IST

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Time Travel

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Problem Description

Professor Tannhaus of Winden built a time machine to bring back his family after his son, daughter-in- law and granddaughter died in a car accident. After the event, the world has completely changed. People started using time machine and travelled in future and past, including doing activities like getting married and having children, in different times. This created so much imbalance in the world because of the children who were born because to parents who did not belong to that time. These children called as **GlitzBorn** while the children born with parents in proper time are referred to as **TrueBorn**.

Jonus and Martha wanted to stop the imbalance in the world. If they succeed, all the GlitzBorn people will not exist.

You will be given some input set and some birth and death events. Based on the data provided you have to print all the persons exist in the world if time machine never existed.

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Constraints

2 <= D <= 100

1000 <= Year of Birth <= 3000

1000 <= Year of Death <= 3000

2 <= E <= 100

- Every Person in Winden has a unique name
- The events will be given as input randomly and not in any chronological order
- For a couple to have children the gap between the man and the woman cannot exceed 20 years
- To give birth to a child, age of both man and woman must be in between 18 to 50
- If any of parents' details are not given, then consider them true born as well as they never travelled through time and are dead now
- If above condition not is not satisfied for either parent, then either one of the parents or both, have travelled through time and so the person is a GlitzBorn
- Children of GlitzBorn are GlitzBorn
- if person year of death is not provided then consider him/her alive till end of world i.e. YearOfDeath = 9999
- Although events provided in the input are random, Death event will not be provided if person does not exist on record yet
- If person travelled to past and died, consider him/her alive if time machine doesn't exist

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Input

First line contains an integer D, denoting the number of data recordsâ€ƒâ€ƒ

Next D lines contain space separated data in the format as depicted below

Name FatherName MotherName YearOfBirth YearOfDeath

Next line contains an integer E, denoting the number of events

Next E lines contain data about every event. Each event has a keyword and is given below

    Birth:

BI Year Name FatherName MotherName

Death:

DE Year PersonName

        Print Name of All TrueBorns that existed in that year based on current data.

PT Year

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Output

Output needs to be printed for all events where the event is *<PT Year>*. The output corresponding to this event type is to print a list of all TrueBorns in lexicographically ascending order with one name per line

[**Note**: If a person dies or is born in a particular year that means he exists in that year]

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Time Limit (secs)

1

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Examples

Input

8

Tronte Unknown Agnes 1943 9999

Jana X Y 1947 9999

Mads Tronte Jana 1974 1986

Ulrich Tronte Jana 1970 9999

Katharina Helene Hermann 1972 1953

Martha Ulrich Katharina 1999 9999

Mikkel Ulrich Katharina 2010 9999

Hannah Sebastian Unknown 1972 1920

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BI 1997 Jonus Mikkel Hannah

PT 2053

BI 1997 Bartosz Aleksander Regina

BI 1921 Agnes Bartosz Silja

PT 2053

Output

Hannah

Jana

Katharina

Martha

Mikkel

Tronte

Ulrich

Bartosz

Hannah

Jana

Katharina

Explanation-

On first print, everyone is printed except Jonus as he is son of Mikkel and Hannah. Mikkel's year of birth is after Jonus' year of birth which indicates that Mikkel traveled through time and hence is Jonus is GlitzBorn.

After getting details of Bartosz and Agnes, we arrived at a conclusion that Agnes is daughter of Bartosz. Since Agnes' year of birth is before Bartosz's year of birth, it indicates that Bartosz has travel through time. Hence Agnes is a GlitzBorn and hence all the descendants. Hence Only names of Hannah, Jana and Katharina are printed.

Upload Solution [Question : F]

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