Who died and made you king (queen) (We can be royals)*

Purpose: multiway trees

Due: February 19^{th}

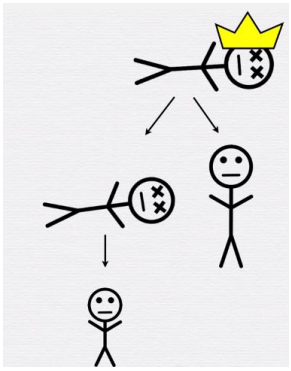

Figure 1: Royal Succession[**?**]

Description

The 1701 rules for succession lay out a unique plan to determine who will be the next monarch of england. In this problem we will ignore religions (A Catholic cannot inherit the crown) as well births out of wedlock. The first rule is that spouses don't count. The husband or wife or a royal is called the royal consort and will not become the next ruler. If not the next monarch is chosen by male primogeniture. [**?**]

Primogeniture is the right, by law or custom, of the firstborn male child to inherit the family estate, in preference to siblings . In the absence of children, inheritance passed to collateral relatives, usually males, in order of seniority of their lines of descent. The eligible descendants of deceased elder siblings take precedence over living younger siblings.[**?**]

*from an idea suggested by Daniel Fawaz

```
def MalePrimogentiture(monarch):
   if monarch.hasChildren is False:
     return MalePrimogeniture(monarch.previous)
  else
     if monarch.hasSons is True:
         return monarch.sons.eldest
     else if monarch.hasDaughters is True:
         return monarch.daughters.eldest
     else
          return none
```

In this program you are first given a series of births, indicating the name and gender of the child. You are then given a name of someone who wants to become the new monarch of England. You are to output the number of people who have to die for that person to inherit the throne of england.

Input

The first line of the input will contain a positive integer b representing the number of births that the program will contain. The next b lines will each document a single birth chronologically. Each birth will of the form parent's name, child's name, and sex (where sex is a single letter either `f` or `m`), each separated by a single space. The names will contain no spaces. The first parent mentioned will be considered the reigning monarch.

This will be followed by a positive integer q representing the number of queries to be made. Each of the next q lines will contain the name of a single royal.

Output

First output a representation of the royal line. (see example). Assume the first of the line is always male. Each generation is indented by 5 spaces. After the tree leave 1 blank line. Then for each query name q, print on 1 line the number of people who need to die for the q^{th} name to become the ruler.

Sample Input

```
16
elizabethII charles m
elizabethII anne f
elizabethII andrew m
elizabethII edward m
charles william m
anne peter m
anne zara f
charles harry m
andrew beatrice f
```

```
andrew eugenie f
edward louise f
edward severn m
william george m
peter savannah f
peter isla f
zara mia f
2
george
peter
```

Corresponding Sample Output

```
elizabethII m
     charles m
          william m
               george m
          harry m
     anne f
          peter m
               savannah f
               isla f
          zara f
               mia f
     andrew m
          beatrice f
          eugenie f
     edward m
          louise f
          severn m

3
12
```

How the program will be graded

Memo

What	pts	Feb 16^{th}
Name	1	
Time Analysis O() of every function (in terms of the number of entries in the tree)	8	
Space Analysis O() of every function (in terms of the number of entries in the tree)	8	
Class Diagram (a struct is a class)	10	

Source Code Document

What	pts	Feb 16^{th}
Name	1	
Description	2	
Style	10	
pre/post conditions	10	
`RoyalTree ::print()`	10	
`RoyalTree::insert(string parent, string child, char sex)`	10	
`TNode * RoyalTree:: sortBySex ( )`	5	
`TNode * RoyalTree:: numToDie ( string)`	10	
`RoyalTree:: RoyalTree ( RoyalTree )`	10	
Rest of program	5	

Required Minimal Data Structures

```
struct TNode
{
    string name;
    char sex;
    vector<TNode*> kids;
    TNode(string n, char s) ;
};

class RoyalTree
{
public:
     RoyalTree();
     void insert(string parent, string child, char sex);
     int numToDie(string name);
     void sortBySex() ;
     void print() ;
private:
```

```
      TNode * root;

};
```

References

[1] You Tube Video, https://www.youtube.com/watch?v=BUY6HGqYweQ

[2] Wikipedia , http://en.wikipedia.org/wiki/Succession to the British throne.

[3] Wikipedia, http://en.wikipedia.org/wiki/Primogeniture