1996/97 ACM International Collegiate Programming Contest  
University of Ulm Internal Contest

# Problem A

# Arbitrage

Source file: arbitrage.c  
Input file: arbitrage.in

Arbitrage is the use of discrepancies in currency exchange rates to transform one unit of a currency into more than one unit of the same currency. For example, suppose that 1 US Dollar buys 0.5 British pound, 1 British pound buys 10.0 French francs, and 1 French franc buys 0.21 US dollar. Then, by converting currencies, a clever trader can start with 1 US dollar and buy 0.5 \* 10.0 \* 0.21 = 1.05 US dollars, making a profit of 5 percent.

Your job is to write a program that takes a list of currency exchange rates as input and then determines whether arbitrage is possible or not.

### Input Specification

The input file will contain one or more test cases. Om the first line of each test case there is an integer *n* (1<=*n*<=30), representing the number of different currencies. The next *n* lines each contain the name of one currency. Within a name no spaces will appear. The next line contains one integer *m*, representing the length of the table to follow. The last *m* lines each contain the name *ci* of a source currency, a real number *rij* which represents the exchange rate from *ci* to *cj* and a name *cj* of the destination currency. Exchanges which do not appear in the table are impossible.  
Test cases are separated from each other by a blank line. Input is terminated by a value of zero (0) for *n*.

### Output Specification

For each test case, print one line telling whether arbitrage is possible or not in the format "Case *case*: Yes" respectively "Case *case*: No".

### Sample Input

3

USDollar

BritishPound

FrenchFranc

3

USDollar 0.5 BritishPound

BritishPound 10.0 FrenchFranc

FrenchFranc 0.21 USDollar

3

USDollar

BritishPound

FrenchFranc

6

USDollar 0.5 BritishPound

USDollar 4.9 FrenchFranc

BritishPound 10.0 FrenchFranc

BritishPound 1.99 USDollar

FrenchFranc 0.09 BritishPound

FrenchFranc 0.19 USDollar

0

### Sample Output

Case 1: Yes

Case 2: No