The data about bank transactions consists of a sequence of transactions: the information of each transaction has the following format:

<from\_account> <to\_account> <money> <time\_point> <atm>

In which:

• <from\_account>: the account from which money is transferred (which is a string of length from 6 to 20 )

• <to\_account>: the account which receives money in the transaction (which is a string of length from 6 to 20)

• <money>: amount of money transferred in the transaction (which is an integer from 1 to 10000)

• <time\_point>: the time point at which the transaction is performed, it is a string under the format HH:MM:SS (hour: minute: second)

• <atm>: the code of the ATM where the transaction is taken (a string of length from 3 to 10)

Example: T00112233445 T001234002 2000 08:36:25 BIDV (at the ATM BIDV, account T00112233445 transfers 2000$ to account T001234002 at time point 08:36:25 (08 hour, 36 minutes, 25 seconds)

A *transaction cycle* of length *k* starting from account *a*1 is defined to be a sequence of account *a*1, *a*2, …, *ak* in which there are transactions from account *a*1 to *a*2, from *a*2 to *a*3, …, from *ak* to *a*1.

Write a program that process the following queries:

* ?count\_total\_transactions: compute the total number of transactions of the data
* ?count\_total\_money: compute the total amount of money of transactions
* ?list\_sorted\_account: compute the sequence of bank accounts (including sending and receiving accounts) appearing in the transaction (sorted in an increasing (alphabetical) order)
* ?amount\_money\_trans\_from <account>: compute the total amount of money transferred from the account <account>
* ?inspect\_cycle <account> k : return 1 if there is a *transaction cycle* of length k, starting from <account>, and return 0, otherwise

**Input (stdin)**

The input consists of 2 blocks of information: the data block and the query block

• The data block consists of lines:

o Each line contains the information about a transaction described above

o The data is terminated by a line containing #

• The query block consists of lines:

o Each line is a query described above

o The query block is terminated by a line containing #

**Output (stdout)**

• Print to stdout (in each line) the result of each query described above

**Example**

**Input**

T000010010 T000010020 1000 10:20:30 ATM1

T000010010 T000010030 2000 10:02:30 ATM2

T000010010 T000010040 1500 09:23:30 ATM1

T000010020 T000010030 3000 08:20:31 ATM1

T000010030 T000010010 4000 12:40:00 ATM2

T000010040 T000010010 2000 10:30:00 ATM1

T000010020 T000010040 3000 08:20:31 ATM1

T000010040 T000010030 2000 11:30:00 ATM1

T000010040 T000010030 1000 18:30:00 ATM1

#

?number\_transactions

?total\_money\_transaction

?list\_sorted\_accounts

?total\_money\_transaction\_from T000010010

?inspect\_cycle T000010010 3

#

**Output**

9

19500

T000010010 T000010020 T000010030 T000010040

4500

1