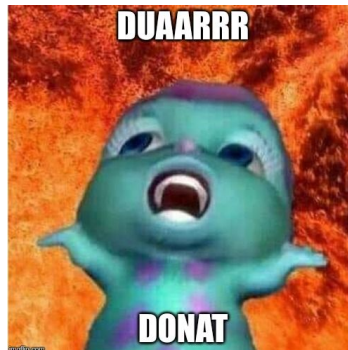

DUAARRR Donat



Source: <https://imgflip.com/memegenerator>

Description

Borman ★ and Choco Chips

Borman ★ is very fond of choco chips. In the city where Borman lives, these chips can be obtained from DUAARRR donuts. There are many variations of DUAARRR donuts (each donut has its own number of chips). In the city, there are a number of shops offering DUAARRR donuts.

Unfortunately, Borman ★ doesn't have money to buy DUAARRR donuts. However, he still dreams of being able to collect choco chips. When the desire to collect chips appears on a certain day (not every day), what Borman usually does is visit donut shops in the city in the morning. He noted what donuts (along with the amount of available stock) were displayed at each of the shops he visited.

Borman ★ returned home and dreamed that he would collect T_i *choco chips* on that day (day- i). In order not to be too desperate, Borman ★ also imagined how he could collect the total T_i *choco chips*. For example to collect 3 choco chips, Borman ★ can choose

- 3 donuts worth 1 chip each (method A), or
- 1 donut is worth 1 chip AND 1 donut is worth 2 chips (method B), or
- (other methods)

The methods above are valid if and only if the donut shops that are open that day do offer donuts with the appropriate number of chips and sufficient stock. If for example all donut shops only sell donuts worth one chip, then method B above is NOT valid. If for example the total stock of donuts is worth 1 chip in all shops in the city is less than 3 pieces, then method A above is NOT valid.

In the end, Borman ★ interested to count how many ways/methods to collect the donuts that are available so that the collected right T_i *choco chips*. Help Borman ★ count them.

DUAARRR Donat and Donut Store

Why is it called a DUARRR donut? Because donuts can explode at any time in the afternoon. On day 0, each store informs the public about the initial stock of donuts they have. Every day, any donut information that explodes and in what store will be announced to city dwellers.

Stores can add donuts to the stock (restock) on certain days. Two shops also can do transfer donuts to each other (a certain number of donuts are moved from one store to another). Every store only accept restock or transfer if the donut that restocked/transferred has the same amount of choco chips. For example, store A has donut **X** with **P** choco chips. If the store A is restocked or transferred by another store with donut **X** with **Q** choco chip, restock or transfer will be failed and the donut will be returned to its origin (restock will return to distributor).

Not all stores are open every day. Donut customers/donut fans (including Borman ★) can only buy/visit stores that are open that day.

On the other hand, the explosion of DUAARRR donut, the process of restocking, and transfer of donuts can occur in any store (including those that are closed). This activity, if it occurs, takes place in the afternoon. However, not all activities must occur every day.

Input

The first line contains the value **N** which is the number of stores.

Next there will be **N** pieces of donut shop information. Each donut shop information consists of one line containing **P_i** and **D_i** (each a donut shop name and the number of varieties of donuts offered), next **D_i** line containing **S_i**, **J_i**, and **C_i** (respectively each is the name of the donut, the amount of stock, and the value of the choco chip that the donut has).

The next line contains value **Q** which states the number of days.

Then there will be **Q** pieces of information (each is information for days 1, 2, ... Q) of the donut store that are open, the number of choco chips that Borman ★ wants to get, and the donuts that will explode in every store.

Any information begins with **X_i** which are the stores that open on the day-i. The next line will contains **X_i** the names of stores that open on the day-i.

The next line will contain the "Target **T_i**" where **T_i** stated amount of chocolate chips desired by Borman ★ on day-i. There are times, Borman ★ doesn't want chips someday.

The next line will contain "Duar **K_i**" where **K_i** states a lot of donut explosion activity that occurred on that day. Next **K_i** will contain information about the donuts which will explode in the format "**P_i S_i B_i**" where **P_i**, **S_i**, and **B_i** denote the name of the store where the donuts were exploding, the kind of donut that exploded, and the number of the donut that exploded.

The next line will contain "Restock **L_i**" where **L_i** states many restock activities will occur on that day. Next **L_i** line will contain information about the activities restock in the format "**P_i S_i B_i C_i**" where **P_i**, **S_i**, **B_i**, and **C_i** denote the name of the store where the donuts are restocked, varieties of donuts that are restocked, the number of donuts that are restocked, and chocolate chip donuts that are restocked.

The next line will contain "Transfer **M_i**" where **M_i** states many transfer activities will occur on that day. Next **M_i** line will contain information transfer activity in the format "**P_i Z_i S_i B_i**" where **P_i**, **Z_i**, **S_i**, and **B_i** denote the store they donuts are transferred, the store destination donut transferred, types of donuts transferred, and the number of donuts transferred.

For more details, see the scheme below:

N
 $P_1 D_1$
 $S_1 J_1 C_1$
 $S_2 J_2 C_2$
 \dots
 $S_{D1} J_{D1} C_{D1}$
 \dots
 $P_N D_N$
 $S_1 J_1 C_1$
 \dots
 $S_{DN} J_{DN} C_{DN}$
 Q
 X_1
 $P_1 P_2 \dots P_{X1}$
 Target T_1
 Duar K_1
 $P_1 S_1 B_1$
 \dots
 $P_{K1} S_{K1} B_{K1}$
 Restock L_1
 $P_1 S_1 B_1 C_1$
 \dots
 $P_{L1} S_{L1} B_{L1} C_{L1}$
 Transfer M_1
 $P_1 Z_1 S_1 B_1$
 \dots
 $P_{M1} Z_{M1} S_{M1} B_{M1}$
 \dots
 \dots
 X_Q
 $P_1 P_2 \dots P_{XQ}$
 Target T_Q
 Duar K_Q
 $P_1 S_1 B_1$
 \dots
 $P_{KQ} S_{KQ} B_{KQ}$
 Restock L_Q
 $P_1 S_1 B_1 C_1$
 \dots
 $P_{LQ} S_{LQ} B_{LQ} C_{LQ}$
 Transfer M_Q
 $P_1 Z_1 S_1 B_1$
 \dots
 $P_{MQ} Z_{MQ} S_{MQ} B_{MQ}$

Output

An integer denotes the number of possibilities Borman ★ to get exact T_i choco chips from DUAARRR donut on day-i, in-modulo $1.000.000.007 (10^9 + 7)$. For example, if the number of possibilities is $1.000.000.011 (10^9 + 11)$, then the output is 4.

Limitation

$1 \leq N \leq 20$	N is the number of stores.
$1 \leq D \leq 20$	D is the donut types on each store.
$1 \leq J \leq 100$	J is the number of donuts in every types.
$1 \leq C \leq 100$	C is the number of choco chips that are put on any donut types.
$1 \leq Q \leq 10$	Q is the number of days.
$1 \leq X \leq N$	X is the number of stores that are open.
$0 \leq T \leq 100$	T is the target number of choco chips that borman wants to collect.
$0 \leq K + L + M \leq 100$	K is the number of donuts that are explode, L is the number of restock activities and M is the number of donut transfer activities on one day.
$1 \leq B \leq 100$	B is the number of donut that are explode, restocked or transferred.
$1 \leq S , P , Z \leq 50$	$ P $ and $ Z $ is the length of the store name, all consist of capital letters . And, $ S $ is the length of the donut name that consist of lower case .

Important Points

1. Every store name and every donut name in each store is guaranteed to be unique. But it could be that between stores there **are the same donut** names with different chocolate chips .
2. The amount of donuts after the explosion, restock , or transfer will **not exceed 100**.
3. The number of types of donuts a store will **not exceed 20**.
4. Exploded or transferred donuts **must be there** and **not more** than the number of available donuts.
5. If the amount of a type of donut in a store is up, then he can receive the same donut transfer with any **amount of chocolate chips**.
6. If a store transfers a donut with the same name to another store and the amount of chocolate chip is different, then the **transaction order will be ignored**.
7. If a store does restock and the amount of chocolate chip is different, then the **restock will be ignored**.

Input Example #1

```

2
ENAK 2
gula 4 3
coklat 3 2
KEREN 1
coklat 9 1
1
2
KEREN ENAK
Target 6
Duar 2
KEREN coklat 5
ENAK gula 4
Restock 0
Transfer 0

```

Output Example #1

```

7

```

Explanation Example #1

In the example above, there are two donut stores named **ENAK** and **KEREN**.

The **ENAK** donut stores has two types of donuts, **gula** donuts and **coklat** donuts . There are 4 stocks of **gula** donuts at the **ENAK** store, each worth 3 choco chips. There are 3 stocks of **coklat** donuts at the **ENAK** store, each worth 2 choco chips. **KEREN** donut store only has one type of donut, namely **coklat** donuts. **Coklat** donuts at KEREN store are worth 1 choco chip and there are 9 stocks.

Borman will visit the donut store on the morning of the first day and he wants to collect 6 choco chips. There are 2 donut shops open on that day, namely **KEREN** and **ENAK** stores.

In the afternoon on the first day, there will be 5 **coklat** donuts exploding in the **KEREN** store and 4 **gula** donuts exploding in the **ENAK** store. That day there was no restock and donut transfer activity.

Borman can collect 6 choco chips with 7 possibilities:

1. 6 **coklat** donut (@1) **KEREN** store
2. 4 **coklat** donut (@1) **KEREN** store and 1 **coklat** donut (@2) **ENAK** store
3. 3 **coklat** donut (@1) **KEREN** store and 1 **gula** donut (@3) **ENAK** store
4. 2 **coklat** donut (@1) **KEREN** store and 2 **coklat** donut (@2) **ENAK** store
5. 3 **coklat** donut (@2) **ENAK** store
6. 2 **gula** donut (@3) **ENAK** store
7. 1 **coklat** donut (@1) **KEREN** store, 1 **coklat** donut (@2) **ENAK** store, and 1 **gula** donut (@3) **ENAK** store

Because Borman only bought on the first day, the donut activity that exploded in the afternoon could be ignored.

Input Example #2

```

3
ENAK 2
gula 4 3
coklat 3 2
KEREN 1
coklat 9 1
JOMBLO 2
gula 5 90
anggur 6 4
4
2
KEREN ENAK
Target 6
Duar 2
KEREN coklat 5
ENAK gula 4
Restock 0
Transfer 0
3
KEREN ENAK JOMBLO
Target 7
Duar 3
KEREN coklat 1
ENAK coklat 3
JOMBLO anggur 2
Restock 0
Transfer 0
2
JOMBLO KEREN
Target 9
Duar 2
JOMBLO gula 1
JOMBLO anggur 2
Restock 0
Transfer 0
3
ENAK JOMBLO KEREN
Target 87
Duar 0
Restock 0
Transfer 0

```

Output Example #2

```

7
4
1
0

```

Explanation Example #2

On the first day the same as example #1, there are 7 possibilities.

After the donuts explode on the afternoon of the first day, the stock of the second day changes to:

- **ENAK** store
 - **gula** donut is 0
 - **coklat** donut is 3
- **KEREN** store
 - **coklat** donut is 4
- **JOMBLO** store
 - **gula** donut is 5
 - **anggur** donut is 6

So to get 7 choco chips on the second day, there are 4 possibilities, namely:

1. 3 **coklat** donut (@2) **ENAK** store and 1 **coklat** donut (@1) **KEREN** store
2. 2 **coklat** donut (@2) **ENAK** store and 3 **coklat** donut (@1) **KEREN** store
3. 1 **coklat** donut (@2) **ENAK** store, 1 **coklat** donut (@1) **KEREN** store, and 1 **anggur** donut (@4) **JOMBLO** store
4. 3 **coklat** donut (@1) **KEREN** store, and 1 **anggur** donut (@4) **JOMBLO** store

The donut stock on the third morning changes to:

- **ENAK** store
 - **gula** donut is 0
 - **coklat** donut is 0
- **KEREN** store
 - **coklat** donut is 3
- **JOMBLO** store
 - **gula** donut is 5
 - **anggur** donut is 4

So to get 9 choco chips, chances are only one way:

1. 2 **anggur** donut (@4) **JOMBLO** store and 1 **coklat** donut (@1) **KEREN** store

The donut stock on the fourth morning changes to:

- **ENAK** store
 - **gula** donut is 0
 - **coklat** donut is 0
- **KEREN** store
 - **coklat** donut is 3
- **JOMBLO** store
 - **gula** donut is 4
 - **anggur** donut is 2

It's impossible to get 87 choco chips from donuts available in stores on the fourth day.

Input Example #3

```

4
ORION 5
kopyor 5 20
gula 40 3
coklat 30 2
tiramisu 10 1
vanilla 10 35
OMEGA 2
durian 50 5
coklat 5 2
TARUNG 1
blueberry 10 2
QUANTA 4
mint 10 10
blueberry 5 2
coklat 60 2
anggur 60 1
7
0
Target 50
Duar 3
ORION coklat 25
ORION tiramisu 10
QUANTA blueberry 1
Restock 2
TARUNG kopyor 8 20
QUANTA vanilla 5 30
Transfer 0
2
TARUNG QUANTA
Target 0
Duar 1
OMEGA durian 35
Restock 0
Transfer 2
TARUNG ORION blueberry 10
TARUNG OMEGA kopyor 8
1
TARUNG
Target 50
Duar 5
ORION kopyor 4
OMEGA durian 14
OMEGA kopyor 7
QUANTA coklat 60
QUANTA anggur 50
Restock 2
TARUNG tiramisu 10 1
QUANTA kopyor 3 20

```

```

Transfer 2
ORION TARUNG gula 5
ORION QUANTA vanilla 3
4
ORION OMEGA TARUNG QUANTA
Target 3
Duar 0
Restock 0
Transfer 0
2
OMEGA TARUNG
Target 20
Duar 1
QUANTA mint 5
Restock 5
OMEGA kopyor 9 20
TARUNG kopyor 10 20
TARUNG tiramisu 80 1
TARUNG coklat 12 5
QUANTA anggur 1 1
Transfer 1
TARUNG QUANTA tiramisu 70
1
QUANTA
Target 12
Duar 4
ORION gula 30
OMEGA durian 1
QUANTA kopyor 2
QUANTA tiramisu 50
Restock 4
ORION coklat 10 3
OMEGA durian 3 5
TARUNG coklat 3 2
QUANTA tiramisu 12 1
Transfer 2
ORION OMEGA gula 5
OMEGA QUANTA kopyor 6
0
Target 0
Duar 0
Restock 0
Transfer 0

```

Output Example #3

```
0
1
0
14
41
48
1
```

Explanation Example #3

There are 4 donut stores in town: ORION, OMEGA, TARUNG, QUANTA

There are 10 variations of donuts in the above problem:

- Kopyor is worth 20 *chips*
- Mint is worth 10 *chips*
- Durian is worth 5 *chips*
- Gula is worth 3 *chips*
- Coklat is worth 2 *chips*
- Blueberry is worth 2 *chips*
- Anggur is worth 1 *chip*
- Tiramisu is worth 1 *chip*
- Vanilla is worth 35 *chips* (first sold in ORION)
- Vanilla is worth 30 *chips* (first sold in QUANTA)

The stock of donuts in the shop for 7 days is described as the table below.

ORION

	Day-1	Day-2	Day-3	Day-4	Day-5	Day-6	Day-7
gula	40	40	40	35	35	35	-
coklat	30	5	5	5	5	5	5
tiramisu	10	-	-	-	-	-	-
kopyor	5	5	5	1	1	1	1
blueberry	-	-	10	10	10	10	10
vanilla	10	10	10	10	10	10	10

OMEGA

	Day-1	Day-2	Day-3	Day-4	Day-5	Day-6	Day-7
durian	50	50	15	1	1	1	3
coklat	5	5	5	5	5	5	5
kopyor	-	-	8	1	1	10	4
gula	-	-	-	-	-	-	5

TARUNG

	Day-1	Day-2	Day-3	Day-4	Day-5	Day-6	Day-7
blueberry	10	10	-	-	-	-	-
kopyor	-	8	-	-	-	10	10
tiramisu	-	-	-	10	10	20	20
coklat	-	-	-	-	-	12	12
gula	-	-	-	5	5	5	5

QUANTA

	Day-1	Day-2	Day-3	Day-4	Day-5	Day-6	Day-7
mint	10	10	10	10	10	5	5
blueberry	5	4	4	4	4	4	4
coklat	60	60	60	-	-	-	-
anggur	60	60	60	10	10	11	11
vanilla	-	5	5	5	5	5	5
kopyor	-	-	-	3	3	3	7
tiramisu	-	-	-	-	-	70	32

Activities Explanation

DUAARRR

Example:

```
..
Duar 3
ORION coklat 25
..
```

There was an explosion of 25 chocolate donuts at the ORION store on the afternoon of the 1st day.
On (morning) Day 1, there were 30 chocolate donuts in ORION store.
On (morning) Day 2, there were 5 chocolate donuts left.

RESTOCK

Example I (success):

```
..
Restock 5
OMEGA kopyor 9 20
..
```

The OMEGA store adds 9 kopyor donut stock (each worth 20 chips) on the 5th afternoon.
On (morning) day 5, there was only 1 kopyor donut stock in OMEGA.
On (morning) the 6th day, there were 10 kopyor donuts.

Example II (success):

```
..
Restock 2
TARUNG tiramisu 10 1
..
```

The TARUNG store has added 10 tiramisu donut stock (1 chip each) on the 3rd afternoon.
On (morning) 3rd day, TARUNG did not have tiramisu stock.
The next day, (morning) the 4th day, there were 10 tiramisu donuts available at TARUNG store.

Example III (failed):

```
..
Restock 5
ORION coklat 10 3
..
```

On the 6th (afternoon) day, the ORION store wants to add 10 pieces of coklat donuts. However, ORION is wrong to buy into distributor (new stock is worth 3 chips, while the coklat donuts that are usually sold at ORION are worth 2 chips). So, the addition of ORION stock failed.

On (morning) 6th day, ORION stock of coklat donuts (2 chips) amounted to 5. On (morning) 7th day, the stock did not change, remained 5.

Example IV (success):

```
..
Restock 2
..
QUANTA vanilla 5 30
..
```

QUANTA wants to add new donut variations on (afternoon) day 1, namely vanilla (worth 30 chips). Although, vanilla donuts that have been sold in the city are usually valued at 35 chips (vanilla donuts were first sold at ORION stores), QUANTA may introduce vanilla donuts with different values (cross-shop).

TRANSFER

Example I (success):

```
..
Transfer 2
TARUNG ORION blueberry 10
..
```

On the 2nd (afternoon) day, the TARUNG shop sold a stock of 10 blueberry donuts to ORION store. So, on (morning) 3rd day, TARUNG no longer has blueberry stock (the day before TARUNG had 10 blueberries), while OMEGA now has 10 blueberries.

Example II (failed):

```
..
Transfer 2
..
ORION QUANTA vanilla 3
..
```

On the 3rd day, ORION intends to sell stock of 3 vanilla donuts to QUANTA. However, the transfer transaction was ignored because vanilla donuts that are usually sold at ORION are different from QUANTA vanilla donuts (number of choco chips is different: 30 and 35).

Explanation of Answers Printed as Program Output

First Day

Answer: 0

There are no shops open. There is no valid way to Borman ★ collect chocolate chips.

Second Day

Answer: 1

Because Borman ★ has no target, there is one way to not collect any donuts.

Third Day

Answer: 0

Borman ★ wants to get 50 choco chips . There is one shop that is open that day, namely TARUNG. However, TARUNG did not have any donut stock that day.

Fourth Day

Answer: 14

All stores open that day and Borman ★ wants to get a total of 3 choco chips.

There are 11 possibilities:

1. 3 **anggur** donut (@1) **QUANTA** store
2. 3 **tiramisu** donut (@1) **TARUNG** store
3. 2 **anggur** donut (@1) **QUANTA** store and 1 **tiramisu** donut (@1) **TARUNG** store
4. 1 **anggur** donut (@1) **QUANTA** store and 2 **tiramisu** donut (@1) **TARUNG** store
5. 1 **coklat** donut (@2) **ORION** store and 1 **anggur** donut (@1) **QUANTA** store
6. 1 **coklat** donut (@2) **OMEGA** store and 1 **anggur** donut (@1) **QUANTA** store
7. 1 **blueberry** donut (@2) **QUANTA** store and 1 **anggur** donut (@1) **QUANTA** store
8. 1 **blueberry** donut (@2) **ORION** store and 1 **anggur** donut (@1) **QUANTA** store
9. 1 **coklat** donut (@2) **ORION** store and 1 **tiramisu** donut (@1) **TARUNG** store
10. 1 **coklat** donut (@2) **OMEGA** store and 1 **tiramisu** donut (@1) **TARUNG** store
11. 1 **blueberry** donut (@2) **QUANTA** store and 1 **tiramisu** donut (@1) **TARUNG** store
12. 1 **blueberry** donut (@2) **ORION** store and 1 **tiramisu** donut (@1) **TARUNG** store
13. 1 **gula** donut (@3) **ORION** store
14. 1 **gula** donut (@3) **TARUNG** store

Fifth Day

Answer: 41

Only 2 shops open: **OMEGA** and **TARUNG**. Borman ★ wants to get a total of 20 choco chips.

Type (Chips)	Stock	Type (Chips)	Stock
kopyor (20)	1	gula (3)	5
durian (5)	1	tiramisu (1)	10
coklat (2)	5		

There are 41 possibilities:

1. 1 **kopyor** donut (@20) **OMEGA** store
2. 1 **durian** donut (@5) **OMEGA** store, 2 **coklat** donut (@5) **OMEGA** store, and 5 **donat** tiramisu donut (@1) **TARUNG** store
3. 1 **durian** donut (@5) **OMEGA** store, 1 **coklat** donut (@5) **OMEGA** store, and 10 **tiramisu** donut (@1) **TARUNG** store
4. 10 **tiramisu** donut (@1) **TARUNG** store, 2 **gula** donut (@3) **TARUNG** store, 2 **coklat** donut (@2) **OMEGA** store
5. etc...

The selection of 4 **durian** donut (@5) **OMEGA** store is **NOT** a valid possibility for Borman ★ collecting a total of 20 choco chips. Because on that day, **OMEGA** shop only had 1 **durian** donut stock.

Sixth Day

Answer: 48

Seventh Day

Answer: 1

Borman ★ has no target and no shops are open. There is one way that is not collecting any donuts.

Bonus Patrick

Source: https://spongebob.fandom.com/wiki/Devil_donut