A - Spoiler

Time Limit: 2 sec / Memory Limit: 1024 MB

Score: 150 points

Problem Statement

You are given a string S consisting of lowercase English letters and |. S is guaranteed to contain exactly two |s.

Remove the characters between the two |s, including the |s themselves, and print the resulting string.

Constraints

- S is a string of length between 2 and 100, inclusive, consisting of lowercase English letters and |.
- S contains exactly two |s.

Input

The input is given from Standard Input in the following format:

S

Output

Print the answer.

Sample Input 1

```
atcoder|beginner|contest
```

Sample Output 1

```
atcodercontest
```

Remove all the characters between the two |s and print the result.

Sample Input 2

```
|spoiler|
```

Sample Output 2

```

```

It is possible that all characters are removed.

Sample Input 3

```
||xyz
```

Sample Output 3

```
xyz
```

B - Delimiter

Time Limit: 2 sec / Memory Limit: 1024 MB

Score: 150 points

Problem Statement

You are given N integers $A_1, A_2, \ldots, A_N$, one per line, over N lines. However, N **is not given in the input.**

Furthermore, the following is guaranteed:

- $A_i \neq 0$ ($1 \leq i \leq N-1$)
- $A_N = 0$

Print $A_N, A_{N-1}, \ldots, A_1$ in this order.

Constraints

- All input values are integers.
- $1 \leq N \leq 100$
- $1 \leq A_i \leq 10^9$ ($1 \leq i \leq N-1$)
- $A_N = 0$

Input

The input is given from Standard Input in the following format:

$$A_1$$
$$A_2$$
$$\vdots$$
$$A_N$$

Output

Print $A_N, A_{N-1}, \ldots, A_1$ in this order, as integers, separated by newlines.

Sample Input 1

```
3
2
1
0
```

Sample Output 1

```
0
1
2
3
```

Note again that N is not given in the input. Here, $N = 4$ and $A = (3, 2, 1, 0)$.

Sample Input 2

```
0
```

Sample Output 2

```
0
```

$A = (0)$.

Sample Input 3

```
123
456
789
987
654
321
0
```

Sample Output 3

```
0
321
654
987
789
456
123
```

C - A+B+C

Time Limit: 2 sec / Memory Limit: 1024 MB

Score: 250 points

Problem Statement

You are given three sequences $A = (A_1, \ldots, A_N)$, $B = (B_1, \ldots, B_M)$, and $C = (C_1, \ldots, C_L)$.

Additionally, a sequence $X = (X_1, \ldots, X_Q)$ is given. For each $i = 1, \ldots, Q$, solve the following problem:

Problem: Is it possible to select one element from each of A, B, and C so that their sum is X_i?

Constraints

- $1 \leq N, M, L \leq 100$
- $0 \leq A_i, B_i, C_i \leq 10^8$
- $1 \leq Q \leq 2 \times 10^5$
- $0 \leq X_i \leq 3 \times 10^8$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&N \\
&A_1 \ \ldots \ A_N \\
&M \\
&B_1 \ \ldots \ B_M \\
&L \\
&C_1 \ \ldots \ C_L \\
&Q \\
&X_1 \ \ldots \ X_Q
\end{aligned}
$$

Output

Print Q lines. The i-th line should contain `Yes` if it is possible to select one element from each of A, B, and C so that their sum is X_i, and `No` otherwise.

Sample Input 1

```
3
1 2 3
2
2 4
6
1 2 4 8 16 32
4
1 5 10 50
```

Sample Output 1

```
No
Yes
Yes
No
```

- It is impossible to select one element from each of A, B, and C so that their sum is 1.
- Selecting 1, 2, and 2 from A, B, and C, respectively, makes the sum 5.
- Selecting 2, 4, and 4 from A, B, and C, respectively, makes the sum 10.
- It is impossible to select one element from each of A, B, and C so that their sum is 50.

D - String Bags

Time Limit: 2 sec / Memory Limit: 1024 MB

Score: 425 points

Problem Statement

You initially have an empty string S.

Additionally, there are bags $1, 2, \ldots, N$, each containing some strings.

Bag i contains A_i strings $S_{i,1}, S_{i,2}, \ldots, S_{i,A_i}$.

You will repeat the following steps for $i = 1, 2, \ldots, N$:

- Choose and perform one of the following two actions:
  - Pay 1 yen, select exactly one string from bag i, and concatenate it to the end of S.
  - Do nothing.

Given a string T, find the minimum amount of money required to make the final S equal T.

If there is no way to make the final S equal T, print `-1`.

Constraints

- T is a string consisting of lowercase English letters with length between 1 and 100, inclusive.
- N is an integer between 1 and 100, inclusive.
- A_i is an integer between 1 and 10, inclusive.
- $S_{i,j}$ is a string consisting of lowercase English letters with length between 1 and 10, inclusive.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&T \\
&N \\
&A_1 \quad S_{1,1} \quad S_{1,2} \quad \dots \quad S_{1,A_1} \\
&A_2 \quad S_{2,1} \quad S_{2,2} \quad \dots \quad S_{2,A_2} \\
&\vdots \\
&A_N \quad S_{N,1} \quad S_{N,2} \quad \dots \quad S_{N,A_N}
\end{aligned}
$$

Output

Print the answer as an integer.

Sample Input 1

```
abcde
3
3 ab abc abcd
4 f c cd bcde
2 e de
```

Sample Output 1

```
2
```

For example, doing the following makes the final S equal T with two yen, which can be shown to be the minimum amount required.

- For $i = 1$, select `abc` from bag 1 and concatenate it to the end of S, making $S =$ `abc`.
- For $i = 2$, do nothing.
- For $i = 3$, select `de` from bag 3 and concatenate it to the end of S, making $S =$ `abcde`.

Sample Input 2

```
abcde
3
2 ab abc
3 f c bcde
1 e
```

Sample Output 2

```
-1
```

There is no way to make the final S equal T, so print `-1`.

Sample Input 3

```
aaabbbbcccc
6
2 aa aaa
2 dd ddd
2 ab aabb
4 bbaa bbbc bbb bbcc
2 cc bcc
3 ccc cccc ccccc
```

Sample Output 3

```
4
```

E - Insert or Erase

Time Limit: 2 sec / Memory Limit: 1024 MB

Score: 475 points

Problem Statement

You are given a sequence $A = (A_1, \ldots, A_N)$ of length N. The elements of A are distinct.

Process Q queries in the order they are given. Each query is of one of the following two types:

- `1 x y` : Insert y immediately after the element x in A. It is guaranteed that x exists in A when this query is given.
- `2 x` : Remove the element x from A. It is guaranteed that x exists in A when this query is given.

It is guaranteed that after processing each query, A will not be empty, and its elements will be distinct.

Print A after processing all the queries.

Constraints

- $1 \leq N \leq 2 \times 10^5$
- $1 \leq Q \leq 2 \times 10^5$
- $1 \leq A_i \leq 10^9$
- $A_i \neq A_j$
- For queries of the first type, $1 \leq x, y \leq 10^9$.
- When a query of the first type is given, x exists in A.
- For queries of the second type, $1 \leq x \leq 10^9$.
- When a query of the second type is given, x exists in A.
- After processing each query, A is not empty, and its elements are distinct.
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&N \\
&A_1 \quad \ldots \quad A_N \\
&Q \\
&\mathrm{Query}_1 \\
&\vdots \\
&\mathrm{Query}_Q
\end{aligned}
$$

Here, Query_i represents the i-th query and is given in one of the following formats:

$$1 \quad x \quad y$$

$$2 \quad x$$

Output

Let $A = (A_1, \ldots, A_K)$ be the sequence after processing all the queries. Print $A_1, \ldots, A_K$ in this order, separated by spaces.

Sample Input 1

```
4
2 1 4 3
4
2 1
1 4 5
2 2
1 5 1
```

Sample Output 1

```
4 5 1 3
```

The queries are processed as follows:

- Initially, $A = (2, 1, 4, 3)$.
- The first query removes 1, making $A = (2, 4, 3)$.
- The second query inserts 5 immediately after 4, making $A = (2, 4, 5, 3)$.
- The third query removes 2, making $A = (4, 5, 3)$.
- The fourth query inserts 1 immediately after 5, making $A = (4, 5, 1, 3)$.

Sample Input 2

```
6
3 1 4 5 9 2
7
2 5
1 3 5
1 9 7
2 9
2 3
1 2 3
2 4
```

Sample Output 2

```
5 1 7 2 3
```

F - Earn to Advance

Time Limit: 4 sec / Memory Limit: 1024 MB

Score: 550 points

Problem Statement

There is a grid with N rows and N columns. Let (i, j) denote the square at the i-th row from the top and j-th column from the left.

Takahashi is initially at square $(1, 1)$ with zero money.

When Takahashi is at square (i, j), he can perform one of the following in one **action**:

- Stay at the same square and increase his money by $P_{i,j}$.
- Pay $R_{i,j}$ from his money and move to square $(i, j + 1)$.
- Pay $D_{i,j}$ from his money and move to square $(i + 1, j)$.

He cannot make a move that would make his money negative or take him outside the grid.

If Takahashi acts optimally, how many actions does he need to reach square (N, N)?

Constraints

- $2 \leq N \leq 80$
- $1 \leq P_{i,j} \leq 10^9$
- $1 \leq R_{i,j}, D_{i,j} \leq 10^9$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&N \\
&P_{1,1} \ \ldots \ P_{1,N} \\
&\vdots \\
&P_{N,1} \ \ldots \ P_{N,N} \\
&R_{1,1} \ \ldots \ R_{1,N-1} \\
&\vdots \\
&R_{N,1} \ \ldots \ R_{N,N-1} \\
&D_{1,1} \ \ldots \ D_{1,N} \\
&\vdots \\
&D_{N-1,1} \ \ldots \ D_{N-1,N}
\end{aligned}
$$

Output

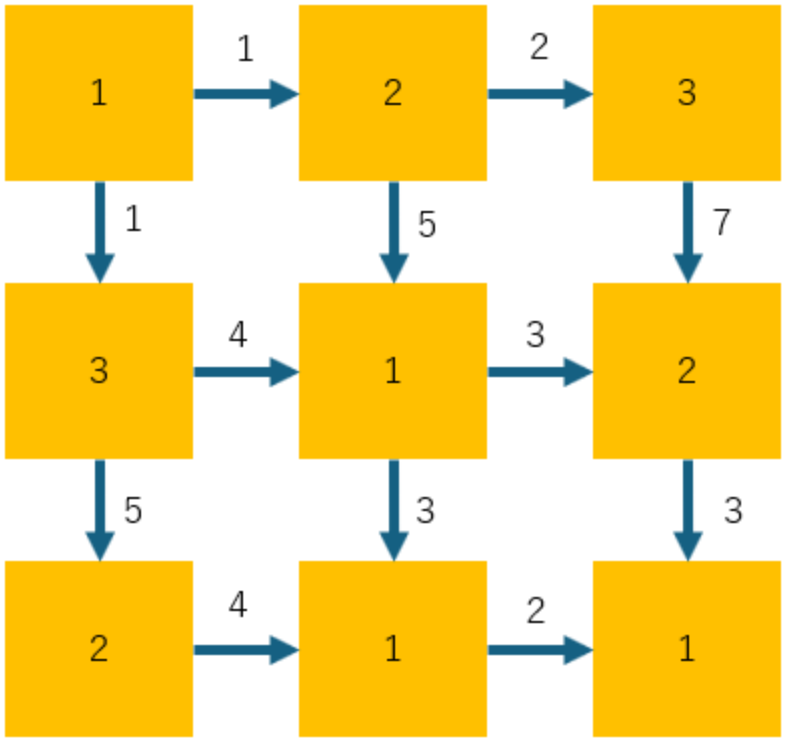
Print the answer.

Sample Input 1

```
3
1 2 3
3 1 2
2 1 1
1 2
4 3
4 2
1 5 7
5 3 3
```

Sample Output 1

```
8
```



It is possible to reach square $(3, 3)$ in eight actions as follows:

- Stay at square $(1, 1)$ and increase money by 1. His money is now 1.
- Pay 1 money and move to square $(2, 1)$. His money is now 0.
- Stay at square $(2, 1)$ and increase money by 3. His money is now 3.
- Stay at square $(2, 1)$ and increase money by 3. His money is now 6.
- Stay at square $(2, 1)$ and increase money by 3. His money is now 9.
- Pay 4 money and move to square $(2, 2)$. His money is now 5.
- Pay 3 money and move to square $(3, 2)$. His money is now 2.
- Pay 2 money and move to square $(3, 3)$. His money is now 0.

Sample Input 2

```
3
1 1 1
1 1 1
1 1 1
1000000000 1000000000
1000000000 1000000000
1000000000 1000000000
1000000000 1000000000 1000000000
1000000000 1000000000 1000000000
```

Sample Output 2

```
4000000004
```

G - Points and Comparison

Time Limit: 10 sec / Memory Limit: 1024 MB

Score: 625 points

Problem Statement

Pay attention to the special input format.

There are N points (X_i, Y_i) in the xy-plane. You are given these points in the input.

Also, Q pairs of integers (A_j, B_j) are given.
Define $f(A_j, B_j)$ as the number of indices i satisfying $Y_i \geq A_j \times X_i + B_j$.

Find $\sum_{j=1}^{Q} f(A_j, B_j)$.

Here, Q gets very large, so (A_j, B_j) are not given directly.
Instead, G_0, R_a, and R_b are given, and (A_j, B_j) are generated as follows:

- First, for $n \geq 0$, define $G_{n+1} = (48271 \times G_n) \mod (2^{31} - 1)$.
- For $j = 1, 2, \ldots, Q$, generate (A_j, B_j) as follows:
  - $A_j = -R_a + (G_{3j-2} \mod (2 \times R_a + 1))$
  - $B_j = -R_b + ((G_{3j-1} \times (2^{31} - 1) + G_{3j}) \mod (2 \times R_b + 1))$

From this method, it can be shown that A_j and B_j satisfy the following constraints:

- $-R_a \leq A_j \leq R_a$
- $-R_b \leq B_j \leq R_b$

Constraints

- All input values are integers.
- $1 \leq N \leq 5000$
- $1 \leq Q \leq 10^7$
- $|X_i|, |Y_i| \leq 10^8$
- The pairs (X_i, Y_i) are distinct.
- $0 \leq G_0 < (2^{31} - 1)$
- $0 \leq R_a \leq 10^8$
- $0 \leq R_b \leq 10^{16}$

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&N \\
&X_1 \quad Y_1 \\
&X_2 \quad Y_2 \\
&\vdots \\
&X_N \quad Y_N \\
&Q \\
&G_0 \quad R_a \quad R_b
\end{aligned}
$$

Output

Print the answer as an integer.

Sample Input 1

```
7
2 -2
-1 -2
0 1
2 1
-2 2
1 2
0 -1
10
1 5 5
```

Sample Output 1

```
36
```

This input contains ten questions.

The generated (A_j, B_j) are
$(-2, 4), (0, 2), (-4, -2), (4, -5), (3, 1), (-1, 3), (2, -5), (3, -1), (3, 5), (3, -2)$.