

Conversations (Easy Version)

Input file: **standard input**
Output file: **standard output**
Time limit: 1.5 seconds
Memory limit: 256 megabytes

Dictators have friends too! Dictator S has some friends that he has conversations with, often discussing some shady details of his schemes.

Every now and then, one of 4 possible operations can happen:

- Dictator S's junior H starts a new conversation topic, that has a unique index i . This topic now becomes the most recent topic. It is guaranteed no two conversation topics at any point in time have the same index.
- Dictator S's senior O deletes an old conversation topic. If it is the current topic, they move to the most recent conversation topic that has not been deleted.
- Dictator S ends the current conversation topic, and they move to the most recent conversation topic that has not been deleted.
- Dictator S' senior Z wakes up, and asks what the current conversation topic is.

Help Dictator S satisfy senior Z!

Input

The first line of input contains 1 integer N . Each of the next $N \leq 5 \cdot 10^5$ lines contains some numbers.

- If the first number is 1, then it is followed by a unique index $i \leq 10^9$ to create a new topic. It is guaranteed that the topic does not and has never existed.
- If the first number is 2 then it is followed by an index i , representing that the conversation with index i has been deleted. It is guaranteed that the conversation topic exists.
- If the first number is 3, then it represents the current topic being deleted. They move to the latest undeleted topic. It is guaranteed there is at least 1 topic.
- If the first number is 4, output the index of the current conversation topic. If there is no current conversation, output -1 .

Output

For each query 4, output the index of the current conversation topic on a new line.

Scoring

Subtask	Score	N	Additional constraints
1	20	$1 \leq N \leq 1000$	-
2	8	-	There are no type 2 or 3 queries
3	12	-	There are no type 2 queries
4	23	-	There are no type 3 queries
5	10	-	$1 \leq i \leq 10^6$ for all conversations
6	27	-	-
Samples	0		Sample Testcases

Examples

standard input	standard output
9 1 4 4 1 2 1 3 3 4 2 4 2 2 4	4 2 -1
9 1 4 1 3 1 6 1 7 4 2 6 4 3 4	7 7 3

Note

Hard version to be released in a future contest xDxD