Getting Started with Competitive programming

Practice Programming Problems

Week 4

Problem 1

The next edition of "NPTEL's got talent" is now around the corner! Since things are not completely normal yet, like many other things, this contest will also be held in "virtual mode". Since we have too many virtual events, the organizers are working hard to make the event exciting with some innovation in the contest format and rules.

Each participant needs to register in the contest with his or her best performance submitted as a recorded video. The judges will initially assign a score to each such submission. Now, several rounds will follow. In each round, any two participants will be called upon a virtual stage. These two participants can pick any one of the submissions that they currently own (the first time this will just be their original submission) and bring it to the face-off. The person who presents the submission with the higher judge's score wins the round. The loser is eliminated from the contest and transfers the ownership of their submission to the winner.

In case both the submissions have equal scores, this round will be considered as a tie and nothing else will happen. Note that initially, each participant will have only one submission and all the participants play the rounds optimally.

Your task is to simulate and answer some queries related to this. You will be given **N** submissions to the contest numbered from **1** to **N** with the **i^{th}** submission belonging to the **i^{th}** participant initially. You will also be given an array **S** where **S[i]** denotes the score given by the judges to the **i^{th}** submission before starting the rounds. You will have to answer **Q** queries, each of which can be of the following types :

1. **0 x y** : This denotes that the participant that has submission number **x** competes with the participant who has submission number **y** currently in this round. If a single participant is the current owner of both the submissions, print **"Invalid query!"** (without quotes), otherwise execute and store the result of this round as described by the rules above.

2. **1 x** : You need to output the index of the participant who owns submission **x** at this point.

Input

First line of input contains an integer **T** denoting the number of test cases. For each test case, the first line contains an integer **N** denoting the number of participants in the contest. The next line contains **N** space separated integers where the **i^{th}** integer represents **S[i]**. The next line contains an integer **Q** denoting the number of queries. **Q** lines follow where each line can be of the format **0 x y** or **1 x** as described in the problem statement.

Output

For each test, print in each line the answer for the queries as described in the problem statement .

Constraints

- **$1 \leq T \leq 25$**
- **$1 \leq N \leq 10000(10^4)$**
- **$0 \leq S[i] \leq 1000000(10^6)$**
- **$1 \leq Q \leq 10000(10^4)$**
- **$1 \leq x, y \leq N$**

Example

```
Input:
1
2
1 2
2
0 1 2
1 1
Output:
2
```

Explanation

There are two participants with scores of submissions **1** and **2** respectively. After the first query, participant **2** acquires submission **1** since **S[2] > S[1]** . Hence, the answer for the second query, i.e owner of the **first** submission is participant **2**.