

AIOLI

Input File: *standard input*
Output File: *standard output*

Time and Memory Limits: 1 second, 256 MB

Congratulations on becoming the official scorekeeper for the Australian Invitational Olympiad in Lined-up Informatics (AIOLI)! This is a competition between two teams – team A and team B – each with N contestants. Each of these $2N$ contestants has a **unique skill level** and each team is lined up in decreasing order of skill, so the most skilled member is at the front of each team's line.

A *match* is a head-to-head contest between a contestant from each team. The contestant with the higher skill level will always win, and will earn 1 point for their team.

The teams will compete in a series of S rounds. In the i -th of these rounds, each of the first a_i contestants from team A will play a match against each of the first b_i contestants from team B, making $a_i b_i$ matches in total.

Your task is to determine the number of points each team scores in each round.

Input

- The first line of input consists of a single integer N .
- The second line of input consists of N integers in decreasing order, the i -th of which gives the skill of the i -th strongest contestant in team A.
- The third line of input consists of N integers in decreasing order, the i -th of which gives the skill of the i -th strongest contestant in team B.
- The fourth line of input consists of a single integer S , the number of rounds to be played.
- The following S lines consist of two integers each, the i -th line of which is $a_i b_i$.

Output

Output must consist of S lines of two integers each. The i -th line must contain the number of points scored in the i -th round by team A and B, respectively.

Sample Input

```
5
10 9 8 5 2
7 6 4 3 1
5
1 1
1 5
5 1
5 5
4 3
```

Sample Output

```
1 0
5 0
3 2
19 6
10 2
```

Explanation

There are five players on each team, with five rounds to be played.

1. In the first round, only the first person from each team play off. Since the first person from team A has skill 10, and the first player from team B has skill 7, team A wins. Therefore team A scores 1 point in this round, and team B scores 0.
2. In the second round, the first player from team A plays against the first 5 players from team B. That is, the first player from team A plays everyone on team B. Since the first player from team A has greater skill than all the players from team B, team A wins all 5 matches. Thus the output is 5 0
3. In the third round, the first player from team B plays against all players in team A. Since the skill of the first player on team B is 7, they lose to the first 3 players on team A with skills 10 9 8, and win against the final 2 players with skills 5 2. Thus the score for this round is 3 2
4. In the fourth round, all players from team A, play against all players from team B, resulting in 25 matches. The first 3 players from team A with skills 10 9 8 win against all players from team B, netting team A 15 points. The fourth player from team A with skill 5 wins matches against the opponents with skills 4 3 1 for a further 3 points for team A. Finally the last player on team A with skill 2 only wins 1 match, the one against the last player of team A with skill 1. Thus team A wins 19 (15 + 3 + 1) points, while team B wins 6 points.
5. Similarly, in the fifth round, the first 4 players from team A 10 9 8 5 each play against the first 3 players from team B 7 6 4, resulting in 12 matches, where team A wins 10 and team B wins 2.

Implementation Notices

This problem has a lot of input data. `printf` and `scanf` will handle it, though it is possible to time out by using `cin` and `cout` incorrectly. If you are using `cin` and `cout` you need to ensure that:

- The first line of your main function is

```
std::cin.tie(0); std::ios_base::sync_with_stdio(0);
```
- That you *do not* use `endl`, use `"\n"` instead.

Additionally, numbers in the problem may exceed the capacity of `int`, you may wish to use `long long` instead.

Subtasks & Constraints

For all subtasks $1 \leq N \leq 100\,000$, $1 \leq S \leq 1\,000\,000$, $1 \leq a_i, b_i \leq N$. Additionally the skill level for each player will lie between 1 and $2N$, inclusive.

- For Subtask 1 (10 points), $N, S \leq 100$.
- For Subtask 2 (35 points), $N, S \leq 3000$.
- For Subtask 3 (20 points), $N \leq 3000$.
- For Subtask 4 (35 points), no further constraints apply.