

E. Petya and Construction Set

time limit per test: 1 second
memory limit per test: 512 megabytes
input: standard input
output: standard output

It's Petya's birthday party and his friends have presented him a brand new "Electrician- n " construction set, which they are sure he will enjoy as he always does with weird puzzles they give him.

Construction set "Electrician- n " consists of $2n - 1$ wires and $2n$ light bulbs. Each bulb has its own unique index that is an integer from 1 to $2n$, while all wires look the same and are indistinguishable. In order to complete this construction set one has to use each of the wires to connect two distinct bulbs. We define a *chain* in a completed construction set as a sequence of distinct bulbs of length at least two, such that every two consecutive bulbs in this sequence are directly connected by a wire. Completed construction set configuration is said to be correct if a resulting network of bulbs and wires has a tree structure, i.e. any two distinct bulbs are the endpoints of some chain.

Petya was assembling different configurations for several days, and he noticed that sometimes some of the bulbs turn on. After a series of experiments he came up with a conclusion that bulbs indexed $2i$ and $2i - 1$ turn on if the chain connecting them consists of exactly d_i wires. Moreover, the following **important** condition holds: the value of d_i is never greater than n .

Petya did his best but was not able to find a configuration that makes all bulbs to turn on, so he seeks your assistance. Please, find out a configuration that makes all bulbs shine. It is guaranteed that such configuration always exists.

Input

The first line of the input contains a single integer n ($1 \leq n \leq 100\,000$) — the parameter of a construction set that defines the number of bulbs and the number of wires.

Next line contains n integers d_1, d_2, \dots, d_n ($1 \leq d_i \leq n$), where d_i stands for the number of wires the chain between bulbs $2i$ and $2i - 1$ should consist of.

Output

Print $2n - 1$ lines. The i -th of them should contain two distinct integers a_i and b_i ($1 \leq a_i, b_i \leq 2n, a_i \neq b_i$) — indices of bulbs connected by a wire.

If there are several possible valid answer you can print any of them.

Examples

input	Copy
3 2 2 2	
output	Copy
1 6 2 6 3 5 3 6 4 5	

input	Copy
4 2 2 2 1	
output	Copy
1 6 1 7 2 6 3 5 3 6	

Codeforces Round #583 (Div. 1 + Div. 2, based on Olympiad of Metropolises)

Finished
Practice


→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++11 5.1.0

Choose file: 未选择任何文件

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.




Submit

→ Problem tags

constructive algorithms graphs math
sortings trees *2000

No tag edit access

→ Contest materials

- Announcement #1 (en) 
- Announcement #2 (ru) 
- Tutorial (en) 

```
4 5
7 8
```

inputCopy

```
6
2 2 2 2 2 2
```

outputCopy

```
1 3
2 3
3 5
4 5
5 7
6 7
7 12
8 12
9 11
9 12
10 11
```

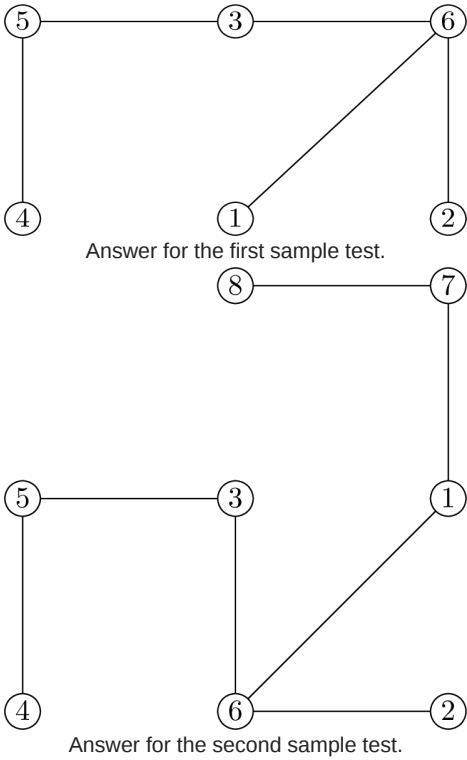
inputCopy

```
2
1 1
```

outputCopy

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

Note



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