D. Degree Set

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given a sequence of n positive integers $d_1, d_2, ..., d_n$ ($d_1 < d_2 < ... < d_n$). Your task is to construct an undirected graph such that:

- there are exactly $d_n + 1$ vertices;
- there are no self-loops;
- there are no multiple edges;
- there are no more than 10^6 edges;
- its *degree set* is equal to d.

Vertices should be numbered 1 through $(d_n + 1)$.

Degree sequence is an array a with length equal to the number of vertices in a graph such that a_i is the number of vertices adjacent to i-th vertex.

Degree set is a sorted in increasing order sequence of all distinct values from the *degree sequence*.

It is guaranteed that there exists such a graph that all the conditions hold, and it contains no more than 10^6 edges.

Print the resulting graph.

Input

The first line contains one integer n ($1 \le n \le 300$) — the size of the degree set.

The second line contains n integers $d_1, d_2, ..., d_n$ ($1 \le d_i \le 1000, d_1 < d_2 < ... < d_n$) — the degree set.

Output

In the first line print one integer m ($1 \le m \le 10^6$) — the number of edges in the resulting graph. It is guaranteed that there exists such a graph that all the conditions hold and it contains no more than 10^6 edges.

Each of the next m lines should contain two integers v_i and u_i ($1 \le v_i, u_i \le d_n + 1$) — the description of the i-th edge.

Examples

input
3 2 3 4

output
8 3 1 4 2 4 5 2 5 5 1 3 2 2 1 5 3

input
3 1 2 3

output

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4
1 2
1 3
1 4
2 3
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