F - Candy Redistribution

Editorial (/contests/abc432/tasks/abc432_f/editorial)

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 525 points

Problem Statement

There are N children, numbered 1 to N.

Child i has A_i candies.

Your goal is to execute the following operation as few times as possible so that eventually all N children have the same number of candies.

- Choose two distinct children x, y, and choose a positive integer z not exceeding the number of candies child x has. Take z candies from child x and give them to child y.

Determine whether there exists a sequence of operations such that eventually all N children have the same number of candies. If it exists, find one such sequence with the minimum number of operations.

Constraints

- $2 \leq N \leq 20$
- $1 \leq A_i \leq 10^8$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{array}{l}
N \\
A_1 \quad \ldots \quad A_N
\end{array}
$$

Output

If there is no sequence of operations such that eventually all N children have the same number of candies, output `-1`.

If it exists, output one with the minimum number of operations in the following format:

$$
\begin{array}{lll}
q & & \\
x_1 & y_1 & z_1 \\
\vdots & & \\
x_q & y_q & z_q
\end{array}
$$

Here, q represents the number of operations, and x_i, y_i, z_i represent the values of x, y, z chosen in the i-th operation.

If there are multiple solutions, outputting any of them will be considered correct.

Sample Input 1 Copy

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```
4
1 7 4 8
```

Sample Output 1 Copy

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

In this sample output, the operations are executed as follows:

1. Take 1 candy from child 2 and give it to child 3. Immediately after this, the number of candies each child has is $1, 6, 5, 8$.
2. Take 1 candy from child 2 and give it to child 4. Immediately after this, the number of candies each child has is $1, 5, 5, 9$.

3. Take 4 candies from child 4 and give them to child 1. Immediately after this, the number of candies each child has is $5, 5, 5, 5$.

Eventually, all N children have exactly five candies each.

Sample Input 2 Copy

```
2
100 3
```

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Sample Output 2 Copy

```
-1
```

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