Preliminaries

(He who has already studied linear algebra may skip this part)

A matrix is composed of $n \times n$ elements. Formally,

$$A = \begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{pmatrix}$$

is an $n \times n$ matrix.

For example,

$$A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

is a 2×2 matrix.

Two operations on matrices will be used in this problem:

1. $A + k$ (A is an $n \times n$ matrix, k is an integer) all the elements in the MAIN diagonal is added by k. That is

$$A + k = \begin{pmatrix} a_{11}+k & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22}+k & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn}+k \end{pmatrix}$$

For example,

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} + 5 = \begin{pmatrix} 6 & 2 \\ 3 & 9 \end{pmatrix}$$

$A - k$ is defined $A + (-k)$, so

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} - 5 = \begin{pmatrix} -4 & 2 \\ 3 & -1 \end{pmatrix}$$

2. $A * B$ (both A and B are $n \times n$ matrices). Let

$$A = \begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{pmatrix}, \qquad B = \begin{pmatrix} b_{11} & b_{12} & \cdots & b_{1n} \\ b_{21} & b_{22} & \cdots & b_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ b_{n1} & b_{n2} & \cdots & b_{nn} \end{pmatrix}$$

and

$$C = A \times B = \begin{pmatrix} c_{11} & c_{12} & \cdots & c_{1n} \\ c_{21} & c_{22} & \cdots & c_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ c_{n1} & c_{n2} & \cdots & c_{nn} \end{pmatrix}$$

then we have:

$$c_{ij} = \sum_{k=1}^{n} a_{ik} b_{kj} = a_{i1} b1j + a_{i2} b_{2j} + \cdots + a_{1n} b_{nj}$$

For example,

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \times \begin{pmatrix} 5 & 6 \\ 7 & 8 \end{pmatrix} = \begin{pmatrix} 5+14 & 6+16 \\ 15+28 & 18+32 \end{pmatrix} = \begin{pmatrix} 19 & 22 \\ 43 & 50 \end{pmatrix}$$

Well, I have no time to explain why matrix multiplication is defined like this. Please just remember it.

Problem

Find a matrix root of this equation: $(A + k_1)(A + k_2)(A + k_3) \ldots (A + k_m) = 0$ where $k_1, k_2, \ldots, k_m$ are distinct integers.

That is, EVERY ELEMENT OF the matrix computed from the left is zero.

For example,

$$A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

is a matrix root of the equation $(A + 1)(A - 5) = 0$ since

$$(A+1)(A-5) = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \times \begin{pmatrix} -4 & 4 \\ 2 & -2 \end{pmatrix} = \begin{pmatrix} -8+8 & 8-8 \\ -8+8 & 8-8 \end{pmatrix} = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$$

It can be proven that there are infinitely many solutions, however, I do not like trivial answer, so your answer must have at least $(n * n)/2$ non-zero elements.

Input

The first line contains the number of tests t ($1 \le t \le 15$). Each case contains two lines. The first line contains an integer m ($1 \le m \le 30$). The second line contains m integers, representing $k_1, k_2, \ldots, k_m$ respectively. Absolute values of the integers are no greater than 100.

Output

For each test case, if no answer can be found, print '`-1`'. Otherwise print n, indicating that you found an $n \times n$ matrix root. The following n lines should be the matrix. It is guaranteed that if there is an answer, the smallest possible n is not greater than 50, so your n should also NOT be greater than 50. The absolute value of integers you gave should not be larger than 1000.

Sample Input

```
2
2
1 -5
2
1 -5
```

Sample Output

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