Problem K. K-onstruction

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

You are given an integer K such that $1 \le K \le 10^6$. Construct any array A of numbers for which the following properties hold:

- The size of A is between 1 and 30;
- All elements are integers between -10^{16} and 10^{16};
- Let N be the size of A. Then there are exactly K subsets S (possibly empty) of set $\{1, 2, \ldots, N\}$ for which $\sum_{i \in S} A_i = 0$.

It can be shown that, under the constraints above, such array A always exists.

Input

The first line contains a single integer t ($1 \le t \le 1000$), the number of test cases.

Each of the next t lines contains a single integer K ($1 \le K \le 10^6$).

Output

For each test case, on the first line, output a single integer N ($1 \le N \le 30$), the size of your array.

On the second line, output N integers $A_1, A_2, \ldots, A_N$ ($-10^{16} \le A_i \le 10^{16}$), the elements of the array.

Example

standard input	standard output
2 3 16	5 2021 -1000 -1021 -2000 -21 4 0 0 0 0

Note

Note that the elements of the array don't have to be distinct.