E. Novice's Mistake

time limit per test: 3 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

One of the first programming problems by K1o0n looked like this: "Noobish_Monk has n $(1 \le n \le 100)$ friends. Each of them gave him a $(1 \le a \le 10000)$ apples for his birthday. Delighted with such a gift, Noobish_Monk returned b $(1 \le b \le \min(10000, a \cdot n))$ apples to his friends. How many apples are left with Noobish_Monk?"

K1o0n wrote a solution, but accidentally considered the value of n as a string, so the value of $n \cdot a - b$ was calculated differently. Specifically:

- when multiplying the string n by the integer a, he will get the string $s = \underbrace{n + n + \cdots + n + n}_{a \text{ times}}$
- when subtracting the integer b from the string s, the last b characters will be removed from it. If b is greater than or equal to the length of the string s, it will become empty.

Learning about this, ErnKor became interested in how many pairs (a, b) exist for a given n, satisfying the constraints of the problem, on which K1o0n's solution gives the correct answer.

"The solution gives the correct answer" means that it outputs a **non-empty** string, and this string, when converted to an integer, equals the correct answer, i.e., the value of $n \cdot a - b$.

Input

The first line contains a single integer t $(1 \le t \le 100)$ — the number of test cases.

For each test case, a single line of input contains an integer n $(1 \le n \le 100)$.

It is guaranteed that in all test cases, n is distinct.

Output

For each test case, output the answer in the following format:

In the first line, output the integer x — the number of bad tests for the given n.

In the next x lines, output two integers a_i and b_i — such integers that K1o0n's solution on the test "n a_i b_i" gives the correct answer.

Example

input Copy

```
3
2
3
10
```

output Copy

```
3
20 18
219 216
2218 2214
1
165 162
1
1262 2519
```

Note

In the first example, $a = 20$, $b = 18$ are suitable, as "2" $\cdot 20 - 18 =$ "22222222222222222222"$- 18 = 22 = 2 \cdot 20 - 18$