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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 ($1 \leq n \leq 100$) friends. Each of them gave him a ($1 \leq a \leq 10000$) apples for his birthday. Delighted with such a gift, Noobish_Monk returned b ($1 \leq b \leq \min(10000, a \cdot n)$) 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 $s = \underbrace{n + n + \dots + n + n}_{a \text{ times}}$
- 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 ($1 \leq t \leq 100$) — the number of test cases.

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

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
```

Codeforces Round 957 (Div. 3)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++20 13.2 (64 bit, wi)

Choose file: Choose File No file chosen

Submit

→ Problem tags

 brute force constructive algorithms
 math strings *1700

No tag edit access

→ Contest materials

- Announcement
- Tutorial #1
- neal's video tutorial (en)
- Shayan's Video Tutorial (en)

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

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