Shri Dattathreya Ramachandra Kaprekar was an Indian mathematician, whose name is associated with a number of concepts in number theory. He was born in Dahanu, near Mumbai, in India. Even as a small child, he was already interested in numbers.

Among his numerous contributions are the so called *Kaprekar numbers*. These are non-negative integer numbers such that the representation of their square can be split into two parts that add up to the original number again. For example, 55 is a *Kaprekar number*, because $55^2 = 3025$, which can be split into 30 and 25, and $30 + 25 = 55$. There is one special rule: both parts of this sum must be positive. This means that, for example, 10 is not a *Kaprekar number*, even when $10^2 = 100$ and 10+0=10 (but the second part of the sum is zero — not positive).

Given a range of numbers, your task is to discover and print all *Kaprekar numbers* within that range.

Input

The first line of input contains a single number N, representing the number of test cases that follow ($1 \leq N \leq 1000$).

Than follow exactly N lines (one for each test case), each one containing two positive integers separated by a single space: INF and SUP ($2 \leq INF \leq SUP \leq 40000$), indicating that the range to consider is the number interval $[INF, SUP]$ (this means that the limits are included in the interval to consider).

Output

For each test case you should start by printing a line in the format '`case #`NUM' where NUM is the test case number (starting in one).

Then, you must print all the *Kaprekar numbers* that appear in the respective range, in ascending order, one per line. If there are no *Kaprekar numbers* in the specified interval, you should print '`no kaprekar numbers`'.

There should also be a blank line between test cases.

Sample Input

```
3
2 90
30 35
50 55
```

Sample Output

```
case #1
9
45
55

case #2
no kaprekar numbers

case #3
55
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