

Modified Kaprekar Numbers

A *modified Kaprekar number* is a positive whole number with a special property. If you square it, then split the number into two integers and sum those integers, you have the same value you started with.

Consider a positive whole number n with d digits. We square n to arrive at a number that is either $2 \times d$ digits long or $(2 \times d) - 1$ digits long. Split the string representation of the square into two parts, l and r . The right hand part, r must be d digits long. The left is the remaining substring. Convert those two substrings back to integers, add them and see if you get n .

Example

$n = 5$
 $d = 1$

First calculate that $n^2 = 25$. Split that into two strings and convert them back to integers 2 and 5 . Test $2 + 5 = 7 \neq 5$, so this is not a modified Kaprekar number. If $n = 9$, still $d = 1$, and $n^2 = 81$. This gives us $1 + 8 = 9$, the original n .

Note: r may have leading zeros.

Here's an explanation from Wikipedia about the **ORIGINAL Kaprekar Number** (spot the difference!):

In mathematics, a Kaprekar number for a given base is a non-negative integer, the representation of whose square in that base can be split into two parts that add up to the original number again. For instance, 45 is a Kaprekar number, because $45^2 = 2025$ and $20+25 = 45$.

Given two positive integers p and q where p is lower than q , write a program to print the modified Kaprekar numbers in the range between p and q , inclusive. If no modified Kaprekar numbers exist in the given range, print `INVALID RANGE`.

Function Description

Complete the `kaprekarNumbers` function in the editor below.

`kaprekarNumbers` has the following parameter(s):

- `int p`: the lower limit
- `int q`: the upper limit

Prints

It should print the list of modified Kaprekar numbers, space-separated on one line and in ascending order. If no modified Kaprekar numbers exist in the given range, print `INVALID RANGE`. No return value is required.

Input Format

The first line contains the lower integer limit p .
The second line contains the upper integer limit q .

Note: Your range should be inclusive of the limits.

Constraints

$$0 < p < q < 100000$$

Sample Input

```
STDIN      Function
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1          p = 1
100       q = 100
```

Sample Output

1 9 45 55 99

Explanation

1, 9, 45, 55, and 99 are the modified Kaprekar Numbers in the given range.