Project Euler #74: Digit factorial chains

This problem is a programming version of Problem 74 from projecteuler.net

The number 145 is well known for the property that the sum of the factorial of its digits is equal to 145:

$$1! + 4! + 5! = 1 + 24 + 120 = 145$$

Perhaps less well known is 169, in that it produces the longest chain of numbers that link back to 169; it turns out that there are only three such loops that exist:

$$169 \rightarrow 363601 \rightarrow 1454 \rightarrow 169 \\ 871 \rightarrow 45361 \rightarrow 871 \\ 872 \rightarrow 45362 \rightarrow 872 $$

It is not difficult to prove that EVERY starting number will eventually get stuck in a loop. For example,

$$69 \rightarrow 363600 \rightarrow 1454 \rightarrow 169 \rightarrow 363601 (\rightarrow 1454) \\ 78 \rightarrow 45360 \rightarrow 871 \rightarrow 45361 (\rightarrow 871) \\ 540 \rightarrow 145 (\rightarrow 145) $$

Starting with 69 produces a chain of five non-repeating terms, but the longest non-repeating chain with a starting number below one million is sixty terms.

For a given length L and limit N print all the integers $\le N$ which have chain length L

Input Format
First line contains T, followed by T lines.
Each line contains N and L separated by space.

Constraints
$1 \le T \le 10$
$10 \le N \le 1000000$
$1 \le L \le 60$

Output Format
Print the integers separated by space for each testcase. Where there are no such number for a given L, print `-1`.

Sample Input

```
10
221 7
147 1
258 4
265 8
210 2
175 7
29 2
24 3
273 4
261 4
```

Sample Output

```
24 42 104 114 140 141
1 2 145
78 87 196 236
4 27 39 72 93 107 117 170 171
0 10 11 154
24 42 104 114 140 141
0 10 11
-1
78 87 196 236 263
78 87 196 236
```