

An Industrial Spy

Industrial spying is very common for modern research labs. I am such an industrial spy – don't tell anybody! My recent job was to steal the latest inventions from a famous math research lab. It was hard to obtain some of their results but I got their waste out of a document shredder. I have already reconstructed that their research topic is fast factorization. But the remaining paper snippets only have single digits on it and I cannot imagine what they are for. Could it be that those digits form prime numbers? Please help me to find out how many prime numbers can be formed using the given digits.

Input

The first line of the input contains an integer t . t test cases follow.

Each test case consists of a single line. This line contains one integer n , and a sequence m consisting of n digits that are on the paper snippets.

Output

For each test case, print one line containing "Case # i : x " where i is its number, starting at 1, and x is the number of different primes that can be reconstructed by shuffling the digits of m . You may ignore digits while reconstructing the primes (e.g., if you get the digits 7 and 1, you can reconstruct three primes 7, 17, and 71). Reconstructed numbers that (regarded as strings) differ just by leading zeros are considered identical (see the fourth case of the sample input).

Constraints

- $1 \leq t \leq 20$
- $1 \leq n \leq 7$
- $0 \leq m_i \leq 9$ for all $1 \leq i \leq n$

Sample Input 1

```
4
2 17
7 1276543
7 9999999
3 011
```

Sample Output 1

```
Case #1: 3
Case #2: 1336
Case #3: 0
Case #4: 2
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