Problem A. Lingering Echo

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 megabytes

Recently, Little Cyan Fish has become interested in a way of encrypting strings. By encrypting a string containing digits, Latin letters, and special symbols in the following way, it becomes difficult for readers to easily figure out its original meaning:

- All Latin letters (case-insensitive) are replaced, in the order of their first appearance in the string, with letters from the beginning of the alphabet, while preserving their original case. For example, "`Qingyu`" becomes "`Abcdef`" after encryption; and for the string "`xtqqwq`", the encrypted result is "`abccdc`".
- All digits are replaced according to the order of their first appearance in the string, with digits from 0 to 9. Equal digits are replaced by the same digit. For example, "`1318`" is encrypted as "`0102`".
- All other special symbols remain unchanged. For example, "`>_<`" remains "`>_<`" after encryption, while "`djq_cpp`" becomes "`abc_dee`".

Little Cyan Fish likes this way of encrypting strings very much. Whether it is their best friend or worst enemy, something they love or hate, all of them can be expressed in this way. So Qingyu wants you to do a simple task: given an encrypted string S, you need to find any original string that can be encrypted into S.

Input

Each test case contains multiple sets of input data. The first line of the input contains an integer T ($1 \le T$), the number of sets of input data.

For each set of input data, the input contains only one line with a string S ($1 \le |S| \le 10^6$).

It is guaranteed that the string contains only the following kinds of characters:

- Uppercase Latin letters ("`A`" to "`Z`").
- Lowercase Latin letters ("`a`" to "`z`").
- Arabic digits ("`0`" to "`9`").
- Special symbols: underscore "`_`", exclamation mark "`!`", question mark "`?`", less-than sign "`<`", greater-than sign "`>`", percent sign "`%`", equals sign "`=`", and hyphen "`-`".

It is guaranteed that S is the encrypted result of some string.

It is guaranteed that the sum of $|S|$ over all sets of input data does not exceed 10^6.

Output

For each set of input data, output one line containing a string, representing any original string you construct.

Example

standard input	standard output
12 Ababcd0112 AbcdeAa Abcdefg AbcabadeFdghiajkd_af_Lemab010223 abcc01 Abcdefg abcda0122 abccde ab0c abcade ========== Abacde?	Cocoly1990 CleinCc Reliauk InfiniteStarlight_is_Kevin090228 cmll02 Lynkcat alpha1022 dottle le0n apiadu ========== Apathy?