18 - INCREMENTING PW

A password scheme accepts passwords that contain combinations of upper-case letters and digits. The scheme restricts passwords to ones in which letters appear in alphabetical order. The digits 0, ..., 9 are treated as coming after Z in alphabetical order; lower digits are treated as coming before higher digits alphabetically. Passwords must contain at least one character (letter or digit) and no duplicate characters are allowed.

For example:

- BIO14 is a valid password;
- OLYMPIAD is not a valid password (letters are not in alphabetical order).

The passwords have been put into an ordered list. If two passwords contain a different number of characters, the password with the fewer characters comes first. If they both have the same number of characters then they are sorted alphabetically.

The ordered list of passwords looks like this: A, B, ..., Z, 0, 1, ... 9, AB, AC, ..., A9, BC, ...

Task

Write a program to determine the nth password in the ordered list. Your program should read in a single integer, $(1 \le n \le 1,000,000,000)$. You should output the string which represents the nth password.

Test cases

1	A
21	U
321	JP
4321	HPQ
54321	LNOV
654321	AHJSVW
7654321	EHJK025
87654321	CEILRU059
234234234	BEHJPVX267
987654321	MNOPQTUX026