

Problem 2: Password check

Dublin City University wants to prevent students and staff from using weak passwords. The Security Department has commissioned you to write a program that checks that some passwords meet all the quality requirements defined by the Password Guidelines Council.

These requirements are as follows. A password is considered strong enough if it has the following properties:

- At least one lowercase letter.
- At least one uppercase letter.
- At least one digit
- At least one symbol from the set `+_)(*^%$#@!./,;{}`
- Minimum length is 12.

Examples:

- The password `"Aa1_"` (without the quotes) meets the first 4 requirements but its length is less than 12.
- The password `"Aa1234567890_"` is perfectly fine.

Input

You'll have to process a batch of password in every test case.

The first line will contain an integer `N` with the number of passwords to process.

Each password will be presented in two lines. The first line will contain an integer `S` with the size of the password. The next line will contain a sequence of `S` characters, the password to check.

The password will only contain the letters from `a` to `z` (both lowercase and uppercase) the digits from 0 to 9 and the following symbols: `"+_)(*^%$#@!./,;{}"` without the quotes.

The maximum size of a password will be 30 characters. Each test case will contain at most 100 passwords to process.



Output

For each password write a line with the word “valid” if the password meets that quality requirement or “invalid” otherwise.

Example 1

Input	Output
2	invalid
4	valid
Aa1_	
13	
Aa1234567890_	

Example 2

Input	Output
5	invalid
18	valid
UtQ.iNlLgT;{f,.GR!	valid
29	invalid
yr)Z,pHQ+No,ZfP_z12D211*MSTfk	valid
23	
.p7hV/Es^aahW%B.1JJou0;	
9	
c7V!*\$11W	
26	
a^pBAAxCohQlBv7qDpVeOB%Min	

