New Password (4pts, 6pts)

Attempts

7

Penalties

1

Penalty Time

00:57:17

Points

done

Points

done

Submissions

Attempt 7

Scheckcheck

00:57:17

remove\_red\_eye

Attempt 6

ScheckWA

00:49:57

remove\_red\_eye

Attempt 5

Sample Failed: WA

00:49:15

remove\_red\_eye

Attempt 4

Sample Failed: WA

00:47:58

remove\_red\_eye

Attempt 3

Sample Failed: WA

00:43:46

remove\_red\_eye

Attempt 2

Sample Failed: WA

00:42:06

remove\_red\_eye

Attempt 1

Sample Failed: WA

00:40:51

remove\_red\_eye

Last updated: May 22 2022, 22:40

Problem

A company named Gooli has issued a new policy that their employees account passwords must contain:

1. At least 77 characters.
2. At least one uppercase English alphabet letter.
3. At least one lowercase English alphabet letter.
4. At least one digit.
5. At least one special character. There are four special characters: #, @, \*, and &.

The company has asked all the employees to change their passwords if the above requirements are not satisfied. Charles, an employee at Gooli, really likes his old password. In case his old password does not satisfy the above requirements, Charles will fix it by appending letters, digits, and special characters. Can you help Charles to find the shortest possible new password that satisfies his company's requirements?

Input

The first line of the input gives the number of test cases, TT. TT test cases follow. Each test case consists of two lines. The first line of each test case contains an integer NN, denoting the length of the old password. The second line of each test case contains the old password of length NN. Old password contains only digits, letters, and special characters.

Output

For each test case, output one line containing Case #xx: yy, where xx is the test case number (starting from 1) and yy is a valid new password, obtained by possibly fixing the old password in the way that Charles wants and satisfying the company's requirements.

It is guaranteed that at least one solution exists. If there are multiple solutions, you may output any one of them.

Limits

Time limit: 20 seconds.  
Memory limit: 1 GB.  
1≤T≤1001≤T≤100.

Test Set 1

7≤N≤1047≤N≤104.  
The old password contains only digits.

Test Set 2

1≤N≤1041≤N≤104.  
The old password contains only digits, letters, and special characters.

Sample

*Note: there are additional samples that are not run on submissions down below.*

Sample Input

[save\_alt](https://codejam.googleapis.com/dashboard/get_file/AQj_6U2stfUrRT4Sv-LYXtn2Ny5z5auupdce77svjrzPyR0gl7qIzI14rXJQX7DLAaHJxZyAs5GnhlCcQ4xCatHQ50g/new_password_sample_ts1_input.txt?dl=1)

content\_copy

2

7

1234567

10

1111234567

Sample Output

[save\_alt](https://codejam.googleapis.com/dashboard/get_file/AQj_6U0AEtAIfv4LARk3EdyyuQ5_PwVGaWvqI41uO7NiOes7Z7tQ3QGUKB9So7oaemGzrqyrKtapRzTZYMD1Yvdw06vT/new_password_sample_ts1_output.txt?dl=1)

content\_copy

Case #1: 1234567aA&

Case #2: 1111234567@Rc

In Sample Case #1, the old password does not satisfy requirements 22, 33, and 55. One possible shortest new password is 1234567aA&.

In Sample Case #2, the old password does not satisfy requirements 22, 33, and 55. One possible shortest new password is 1111234567@Rc.

Additional Sample - Test Set 2

*The following additional sample fits the limits of Test Set 2. It will not be run against your submitted solutions.*

Sample Input

[save\_alt](https://codejam.googleapis.com/dashboard/get_file/AQj_6U1FitZ-N-aP16VTLwaLXBC3EDVfwJ8b80b7T-3_tEx7nAo6UZKyOLyVDT5C9osWBQuz2iy13VKpFEbzgHn1NLA/new_password_sample_ts2_input.txt?dl=1)

content\_copy

3

1

A

2

1\*

7

1234aB&

Sample Output

[save\_alt](https://codejam.googleapis.com/dashboard/get_file/AQj_6U0l-muTdWfCXQaZTQR-Qxjsf1AvLHQhkIWt2LEdLi85YbhHkqDSc4uBtaPNyEXtBcBXoaFFP4oHrWT2qlp6pKyv/new_password_sample_ts2_output.txt?dl=1)

content\_copy

Case #1: Aa1\*111

Case #2: 1\*abAA\*

Case #3: 1234aB&

In Sample Case #1, the old password does not satisfy requirements 11, 33, 44, and 55. One possible shortest new password is Aa1\*111.

In Sample Case #2, the old password does not satisfy requirements 11, 22, and 33. One possible shortest new password is 1\*abAA\*.

In Sample Case #3, the old password already meets all the requirements so Charles does not have to change his password.