String To Binary

It is an easy problem.you have a string (without any space) & you should find the Binary of sum of string ascci value.

your have to remove all duplicate character from the string.

Ex:

SSsssstttrriiinnng = Sstring

HELLO = HELO

Input

The input consists of N<=20 cases.The first line of the input contains only positive integer N. Then follow the cases. Each case consists a string S without any space.the length of the S could be around 1000>=S.include special character.

Output

For each cases you should print case number & Binary of sum of string ascci value.ex(#1 : ......) & print new line for every test cases.

Example

Input:
2

HELLO

SSSPPPOOOJJJ

Output:
#1 : 100101000

#2 : 100111100