

Melodiniq

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

Uni and her teammates are unlocking a high-difficulty song through Linked VERSE. During the unlocking process, four players simultaneously play a song containing n notes.

Each player starts with a Gauge of 2000. For every note, each player receives one of five judgements:

- JUSTICE HEAVEN (H): This judgement does not decrease the player's Gauge.
- JUSTICE CRITICAL (C): This judgement does not decrease the player's Gauge.
- JUSTICE (J): This judgement decreases the player's Gauge by 50.
- ATTACK (A): This judgement decreases the player's Gauge by 100.
- MISS (M): This judgement decreases the player's Gauge by 200.

Meanwhile, each player has an independent combo counter. When a player receives a JUSTICE HEAVEN judgement, their own combo count increases by 1; receiving any other judgement resets only their own combo count. When a player's combo count reaches 100, they increase the Gauge of each of the other three players by 30 and reset their own combo count.

For each note, the corresponding judgements of all players are resolved **simultaneously**; that is, each player's Gauge changes directly to the value obtained after all changes are applied at once. After the resolution, if a player's Gauge is ≥ 2000 , it is set to 2000.

However, *Uni* notices that after the judgements for all notes have been resolved, if a player's Gauge was ≤ 0 at **any** point, their Gauge is forcibly set to 0 before the game ends. Can you help her find each player's Gauge at the end of the game?

Input

This problem contains multiple test cases.

The first line contains a positive integer T ($1 \leq T \leq 10^4$), representing the number of test cases.

For each test case:

- The first line contains an integer n ($1 \leq n \leq 10^5$).
- Each of the next four lines contains a string s of length n , where the i -th character represents that player's judgement on the i -th note.

It is guaranteed that the sum of n over all test cases does not exceed 10^5 , and that every string contains only the five characters H, C, J, A, and M.

Output

For each test case, output four integers representing the final Gauge values of the four players, in input order.

Example

standard input	standard output
3	2000 1750 1500 1000
5	1300 2000 900 1050
CCCCC	0 2000 830 1930
JJJJJ	
AAAAA	
MMMMM	
10	
HCJAMHCJAM	
CHCHCHCHCH	
JAMJAMJAMJ	
MAJHAMMACH	
103	
MMMMMMMMMMCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCC	
CCC	
HHHHHHHHHHHHHHHHHHHHHH	
HHHHHHHHHHHHHHHHHHHHHH	
HHHHHHHHHHHHHHHHHHHHHH	
HHHHHHHHHHHHHHHHHHHHHH	
HHHHHHHHHHHHHHHHHHHHHH	
HHH	
CJJCJCJCJHHHHHHHHHHHHHH	
HHHHHHHHHHHHHHHHHHHHHH	
HHHHHHHHHHHHHHHHHHHHHH	
HHHHHHJJJCJCJCJCJCJCJCJ	
CJCJCJCJCJCJCJCJCJCJCJ	
CJC	
HHHHHHHHHHHHHHHHHHHHHH	
HHHHHHHHHHHHHHHHHHHHHH	
HHHHHHHHHHHHHHHHHHHHHH	
HHHHHHHHHHHHHHHHHHHHHH	
HHHHHHHHHHHHHHHHHHHHHH	
HHH	

Note

To ensure that the PDF is displayed correctly, several blank lines have been inserted into the last sample. You can download the original sample from Domjudge.



Thank you for solving

Illustrator: *Nagisa11*