1329 – Playing Cards

In a regular card set there are 52 cards, each card has two parts, the value and the suit. The values are one of **2, 3, 4, 5, 6, 7, 8, 9, T, J, Q, K, A** and the suit is one of **H, S, D, C**. Cards are represented first by their value and then by their suit. For example, **7H, 2C, JD** etc are some cards.

Now from the regular card set, you removed some of the cards (probably 0). Your task is to find the number of ways you can place the cards in a line such that no two adjacent cards have the same value. You have to use all the cards (of course the remaining cards).

For example, **2H, 3C, 5C** is a valid solution, but **5H, 5C, 7S** is not.

Input

Input starts with an integer **T (≤ 20000)**, denoting the number of test cases.

Each case starts with a line containing an integer **n (1 ≤ n ≤ 52)** denoting the number of **remaining** cards, followed by **n** remaining cards (a single space precedes every card). Assume that the cards are from the regular set and no card is reported more than once. Also assume that the cards will be represented as stated above.

Output

For each case, print the case number and the number of ways to place the cards in a line such that no two adjacent cards have the same value. Print the result modulo 2^{64}.

Sample Input	Output for Sample Input
5 1 TC 2 TC TS 5 2C AD AC JC JH 4 AC KC QC JC 6 AC AD AS JC JD KD	Case 1: 1 Case 2: 0 Case 3: 48 Case 4: 24 Case 5: 120