Magic 12 Months

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

It's New Year's Eve, and it's also the best time of the year to play the card game *Magic* 12 *Months* to pray for good luck of the coming year. BaoBao has just found a deck of standard 52 playing cards (without Jokers) in his pocket and decides to play the game. The rules are as follows:

1. **Setup**
   1.1. Remove the four 'K's from the 52 cards.
   1.2. Shuffle the remaining 48 cards and divide them face down into 12 piles (4 cards per pile) with equal probability.
2. **Gameplay**
   2.1. Let $p = 1$.
   2.2. Flip the card on the top of the p-th pile, check its rank r, and discard the card.
   2.3. If r is a number, let $p = r$; If $r =$ 'A', let $p = 1$; If $r =$ 'J', let $p = 11$; If $r =$ 'Q', let $p = 12$.
   2.4. If the p-th pile is empty, the game ends; Otherwise go back to step 2.2.

When the game ends, having all the 4 cards of rank m flipped and discarded indicates that the m-th month in the coming year is a lucky month.

BaoBao is in the middle of the game and has discarded n cards. He wants to know the probability that the i-th month of the coming year is a lucky month for all $1 \le i \le 12$ when the game ends. Given these n cards, please help him calculate the answer.

Input

There are multiple test cases. The first line of input contains an integer T (about 100) – the number of test cases. For each test case:

The first and only line contains an integer n ($0 \le n \le 48$) – the number of flipped cards, followed by the rank of the n cards $r_1, r_2, \ldots, r_n$ ($r_i \in$ {A, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q}) separated by a space in the order they are flipped. It's guaranteed that the input describes a valid and possible situation of the game.

Output

For each test case output one line containing 12 numbers separated by a space, where the i-th number indicates the probability that the i-th month of the coming year is a lucky month.

You should output a probability in its simplest fraction form A/B where A and B are coprime. Specifically, if the probability equals 0, you should output 0; If the probability equals 1, you should output 1.

Please, DO NOT output extra spaces at the end of each line, or your answer may be considered incorrect!

Example

standard input
3 30 9 Q 10 J Q 10 J 10 J J 8 5 7 6 5 7 6 7 6 6 3 A 2 4 A 2 4 2 4 4 0 7 2 A 3 A 4 A A
standard output
1 2/3 2/5 1 1/2 1 2/3 2/5 2/5 2/3 1 1/2 1 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1 0 0 0 0 0 0 0 0 0 0 0