Juggling Prediction

Juggling requires uninterrupted concentration, thorough synchronization of the hands movement with the eyes, perfect timing and keeping the rhythm. Even several studies have shown that juggling is beneficial for brain development. Considering the juggling of 3 balls, the truth is that there are at most two balls in the air simultaneously, never all three. This task is slightly less difficult, nevertheless, it still may strike the eye of a beholder as an art when done properly. Since there is a pattern it is, therefore, possible to predict it, if we assume that juggling is perfect. The process of juggling 3 balls is the following repetitive process:

1. The person starts with 2 balls in his/her dominant hand and 1 ball in the other.
2. One ball from the dominant hand is thrown to the air.
3. Once the thrown ball reaches the maximum height, then it starts falling to the other hand, and at this point, the ball in the other hand is thrown to the air and subsequently, the first ball is caught.
4. The ball from the other hand is thrown to the dominant hand the same way as described above.

We are interested in the *state of the balls* at a specific point in time. Specifically, we want to know, given k repetitions of the *throw and catch* process under the assumption of perfect juggling of 3 balls, what ball is in the air and what two balls are in the left and the right hand. All balls are identified by color (less than 10 alphabetic, lower-case characters). We assume that the person is left-handed and the ball that is thrown as first is the one given as first on the input.

For example, consider a case of balls with colors `red`, `green` and `blue`. The first two balls are in the left (dominant) hand, and the `red` ball is thrown as first. The sequence of throws at individual points in time (t) is the following:

time (t)	0	1	2	3	...	k	...
left hand	`red`, `green`	`green`	`green`	`blue`	...	`red`	...
air		`red`	`blue`	`green`	...	`green`	...
right hand	`blue`	`blue`	`red`	`red`	...	`blue`	...

Input

The input contains several test cases terminated by the end-of-file (`EOF`) character. Each test case consists of 3 colors for each ball, where the first two are placed in the left hand at $t = 0$. Then a positive integer $k \leq 10^{18}$ representing the kth iteration of the *throw and catch* process.

Output

For each test case print a single line consisting of 3 colors describing the current *state of the balls* for the left hand, air, and the right hand, in this exact order, separated by a single space.

Input sample

```
red green blue 1
turquoise magenta indigo 4
black white black 10000000000000
```

Output sample

```
green red blue
indigo turquoise magenta
black black white
```