



# 1: Reversed Wordle

**Level:** Hard

**Time limit:** 1 second

People in the Kelder like to play wordle a lot, since everyone plays it so often they became very good at it. That is why a new game was introduced called “Reverded Wordle”. In this game, you only get the colours of the wordle output and it is your job to guess what has to be put on the lines. Just like in wordle, the following is true:

- Green: The character is correct and on the right spot
- Yellow: The character is in the wordle, but not on the right spot
- Grey: The character is not in the wordle <sup>1</sup>

The kandies tried to play wordle, however, they managed never to guess a correct character and never guessed more yellow characters than in their first guess. So the number of yellow squares is the same on each row. The kandies did learn a little before the holidays so the word guessed will always match the previous clues from the previous guesses. They wanted the help of the Competition committee to find out the answer. The kandies tried sending the committee the game’s progress, but it got so compressed that only the colour of the squares remained visible. This makes it a perfect candidate for “Reversed Wordle” Given the progress, can you determine what the guesses were?

## Input

The first line of input consists of two positive integers  $N$  and  $M$  ( $1 \leq N, M \leq 100$ )  $N$  is the number of characters of the wordle and  $M$  is the number of guesses that were made. Next, there will be  $N$  lines, with  $M$  characters each, the  $i$ -th of which gives the colour of the  $i$ -th guess. Y is for yellow and G is for grey. The number of Y is constant for all lines. Then, there will

<sup>1</sup>If a character is already marked green and guessed again, it will appear grey unless the wordle solution contains another instance of that character that hasn’t been correctly guessed yet.

be a final line with one positive integer  $P$  ( $1 \leq P \leq 10^6$ ), giving the number of valid characters in the wordle

## Output

If there is no way to achieve the given colours print `Bugged!` . Otherwise print  $N + 1$  lines with  $M$  numbers each, splitted by spaces. The first  $N$  lines should give the colouring in the input if the number  $i$  denotes the  $i$ -th character in the alphabet. The final line (the  $(N + 1)$ -st line) should give a secret word that could have resulted in this guesses being valid. If there are multiple possible solutions any one of them will be accepted.

### 1 Explanation of the sample

In the first sample, there is a valid sequence of guesses. In the first move, the kandies guessed `3 1 4 2`, this shows that 1 and 2 are somewhere in the wordle. The next gues `2 5 6 1` is valid since it could have been the answer given the information of the first guess. An example of an invalid guess would be `4 1 6 5`. This is invalid since we know 4 does not occur in the password and 1 is not in the correct position.

#### Sample input 1

```
3 4
GYGY
YGGY
GYYG
26
```

#### Sample input 2

```
4 5
GYYGG
YGGGY
YGYGG
GYGGY
16
```

#### Sample output 1

```
3 1 4 2
2 5 6 1
7 2 1 8
1 9 2 10
```

#### Sample output 2

```
Bugged!
```