

WOBURN CHALLENGE

2017-18 Online Round 4

Friday, April 20th, 2018

Junior Division Problems

Automated grading is available for these problems at:

wcipeg.com

For more problems from past contests, visit:

woburnchallenge.com

Problem J1: Fight or Flight

17 Points / Time Limit: 2.00s / Memory Limit: 16M

Submit online: <http://wcipeg.com/problem/wc174j1>



On their way to meet up with the remaining members of the Avengers, Captain America and Thor have fallen into an ambush set up by the evil Thanos! They have suddenly found themselves face to face with the Black Order, a fearsome group of supervillains, each with their own dangerous powers. Thanos hopes to deal a crippling blow to the Avengers by taking out two of their members before the impending Infinity War has even begun!

Despite Captain America and Thor being skillful fighters in their own right, the fact that they're outnumbered poses a serious problem. With the Black Order bearing down on them, they have only moments to decide on their course of action – should they engage in combat despite the odds, or attempt to escape?

Captain America's opinion is represented by a string C , which is equal to either "Fight" or "Run". Similarly, Thor's opinion is represented by a string T , which is also equal to either "Fight" or "Run". If the two of them have the same opinion, then it's clear what they'll do! However, if their opinions differ, then their joint indecision may be their downfall...

Given the opinions of the two heroes, determine what their course of action will be – either "Fight" or "Run" if they agree, or "Undecided" if they disagree.

Input Format

The first line of input consists of a single string, C .
The next line consists of a single string, T .

Output Format

Output a single string, either the heroes' course of action if they agree, or "Undecided" if they disagree.

Sample Input 1

Run
Run

Sample Output 1

Run

Sample Input 2

Fight
Run

Sample Output 2

Undecided

Sample Explanations

In the first case, Captain America and Thor both agree to "Run", while in the second case, their differing opinions result in their course of action being "Undecided".

Problem J2: Anger Management

23 Points / Time Limit: 2.00s / Memory Limit: 16M

Submit online: <http://wcipeg.com/problem/wc174j2>

Bruce Banner is a scientist with a bit of a problem. Whenever he becomes too angry, he transforms into a large green creature with superhuman strength, known as the Hulk! This can be very useful when he's helping the Avengers battle against the forces of evil, but isn't so useful in his daily life.

Natasha Romanova, the Black Widow, has become concerned that Bruce may be undergoing his transformation too often, so she's going to monitor his activities in secret over the course of one day. She's noticed that Bruce's mind essentially keeps track of an

"anger level", an integer which starts at 0 at the beginning of each day. During a particular day, Bruce will undergo a sequence of N ($1 \leq N \leq 100$) experiences after waking up, with the i -th one causing his anger level to increase by A_i ($-5 \leq A_i \leq 5$). Note that his anger level may become negative during the day.



Bruce takes the form of the Hulk whenever his anger level is 10 or greater. This means that he transforms into the Hulk whenever his anger level goes from being less than 10 to being greater than or equal to 10. Natasha is interested in counting the number of times that this transformation takes place (in other words, the number of experiences which cause Bruce to go from not being the Hulk to suddenly being the Hulk). Can you help her count them?

Input Format

The first line of input consists of a single integer, N .

N lines follow, the i -th of which consists of a single integer, A_i , for $i = 1..N$.

Output Format

Output a single integer, the number of times which Bruce Banner transforms into the Hulk.

Sample Input

6
4
4
3
2
-4
1

Sample Output

2

Sample Explanation

Bruce transforms into the Hulk as a result of the 3rd experience (which increases his anger level from 8 to 11), and again as a result of the 6th experience (which increases his anger level from 9 to 10).

Problem J3: The Infinity Stones

26 Points / Time Limit: 2.00s / Memory Limit: 16M

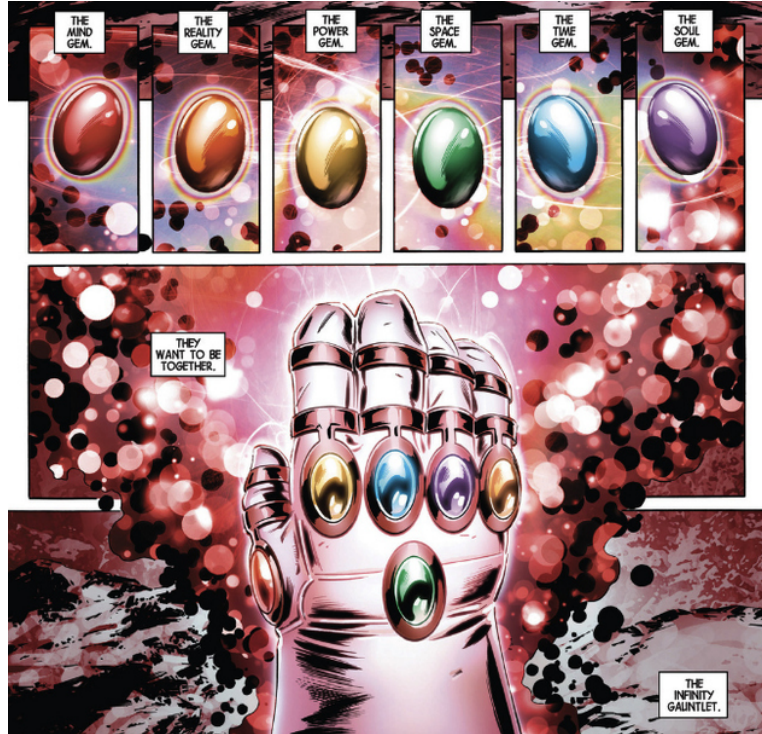
Submit online: <http://wcipeg.com/problem/wc174j3>

The Infinity Stones... A set of six ancient gems with unrivaled power, scattered across the galaxy. Possessing all six would surely grant one the power to rule over all life with no opposition. Which is exactly what Thanos intends to do!

The six Infinity Stones are referred to by the following names in alphabetical order:

Mind
Power
Reality
Soul
Space
Time

Thanos is already in possession of N ($0 \leq N \leq 6$) of the Infinity Stones, the i -th of which is S_i . Each stone is guaranteed to be one of the six mentioned above, the stones may be listed in any order, and no stone is listed multiple times.



Thanos intends to wage a war against the Avengers and anyone else foolish enough to try to stop him, while finishing his search for the remaining Infinity Stones. Determine the names of the $6 - N$ remaining stones which Thanos doesn't yet possess, in alphabetical order.

Subtask: In test cases worth 12/26 of the points, $N = 1$.

Input Format

The first line of input consists of a single integer, N .
 N lines follow, the i -th of which consists of a single string, S_i , for $i = 1..N$.

Output Format

Output $6 - N$ lines, the i -th of which consists of a single string corresponding to the name of the i -th stone (in alphabetical order) which Thanos doesn't possess.

Sample Input

1
Soul

Sample Output

Mind
Power
Reality
Space
Time

Sample Explanation

Thanos already has the Soul Stone, so he still needs the other five.

Problem J4: Efficiency

34 Points / Time Limit: 2.00s / Memory Limit: 16M

Submit online: <http://wcipeg.com/problem/wc174j4>

An invasion of Earth is underway, marking the beginning of the Infinity War! Thanos has dispatched a legion of cybernetically enhanced Chitauri soldiers to a field in rural America, ordering them to stand by for further instructions. As luck would have it, the Avengers' expert archer Hawkeye happens to be standing in the same field! Though perhaps he's not so lucky after all, as he's only stocked with a single arrow.

Looking at the field from above, it can be represented as a grid with R rows and C columns ($1 \leq R, C \leq 50$), aligned with the four cardinal directions (North/East/South/West). The contents of each of the grid's cells can then be represented by one of three characters:

- "H": Hawkeye's location
- "C": A Chitauri soldier's location
- ".": Empty space

Note that the grid contains exactly one "H".

Thinking quickly, Hawkeye has realized that he'll need to be as efficient as possible with his single arrow. He can choose to fire it in a straight line from his location, exactly in one of the four cardinal directions (North, East, South, or West). Upon releasing the arrow, it will travel through all of the cells in the chosen direction until it reaches the edge of the field, even freely passing through (and killing) any Chitauri soldiers along the way.

Assuming that Hawkeye chooses the best cardinal direction to fire his arrow in, what's the largest number of Chitauri soldiers which he can kill?



Input Format

The first line of input consists of two space-separated integers, R and C . R lines follow, the i -th of which consists of C characters representing the i -th row of the grid, for $i = 1..R$.

Output Format

Output a single integer, the maximum number of Chitauri soldiers which Hawkeye can kill.

Sample Input

```
4 5
.CCC.
C....
C.CHC
..C..
```

Sample Output

2

Sample Explanation

Hawkeye will kill two soldiers if he fires his arrow to the West.