

Vaccine Efficacy

Problem ID: vaccineefficacy

To determine the efficacy of a vaccine against a disease, a clinical trial is needed. Some participants are given the real vaccine, while others are given a placebo as the control group. The participants are tracked to determine if they are infected by three different strains (A, B, and C) of a virus. The efficacy of the vaccine against infection by a particular strain is simply the percentage reduction of the infection rate of the vaccinated group compared to the control group.

For example, suppose that there are 40 people in the vaccinated group, 8 of which are infected by strain B. Then the infection rate is 20%. Further suppose that 50 people are in the control group, and 30 people are infected by strain B. Then the infection rate for the control group is 60%. Thus the vaccine efficacy against infection is approximately 66.67% (since 20% is a 66.67% percentage reduction of 60%). If the infection rate for a particular strain in the vaccinated group is not lower than that of the control group, the vaccine is not effective against infection by that strain.

What is the vaccine efficacy against infection by the three strains?

Input

The first line of input contains an integer N ($2 \leq N \leq 10\,000$) containing the number of participants in the clinical trial.

The next N lines describe the participants. Each of these lines contains a string of length four. Each letter is either 'Y' or 'N'. The first letter indicates whether the participant is vaccinated with the real vaccine, and the remaining three letters indicate whether the participant is infected by strain A, B, and C, respectively.

There is at least one participant in the vaccinated group and the control group. There is at least one participant in the control group infected by each strain (but they may be different participants).

Output

Display the vaccine efficacy against infection by strain A, B, and C in that order. If the vaccine is not effective against infection by a particular strain, display `Not Effective` for that strain instead. Answers with an absolute error or relative error of at most 10^{-2} will be accepted.

Sample Input 1

```
10
NYYN
NNYY
NYYY
NYYN
NNNY
YYNN
YYYN
YYNY
YYNN
YYNY
```

Sample Output 1

```
Not Effective
66.666667
50.000000
```

Sample Input 2

```
8
NYYY
NYYY
NYYY
NYYY
YNNN
YNNN
YNNN
YNNN
```

Sample Output 2

```
100.000000
100.000000
100.000000
```