Arithmetic Prank
Problem ID: arithmeticprank

Bob is just starting his career as a prankster, and his first prank is simply saying that A+B=C when in fact it isn't. While this is a simple prank, Bob understands that it's a first step towards more elaborate and satisfying ones in the future.

Bob asked your help to verify if his prank is correct.

input

The input will consist of a single line containing three integers A, B, and C, ($-10^9 \le A, B \le 10^9$, $-2 \cdot 10^9 \le C \le 2 \cdot 10^9$) separated by spaces. Your goal is to verify if $A + B \ne C$.

output

If $A + B = C$ print "Try again, Bob". Otherwise print "Good job, Bob!"

Sample Input 1	Sample Output 1
2 2 4	Try again, Bob

Sample Input 2	Sample Output 2
2 2 5	Good job, Bob!

Hidden Message
Problem ID: hiddenmessage

It's April Fools and Azi loves playing pranks on people. Azi has decided to send an email to their PhD adviser with a prank (something along the lines of "I'm leaving the program"), but as they are afraid of repercussions Azi decided to leave a hidden message so that they can prove that it was a prank.

They decided to write the email in such a way that the first letter of each line reveals that it was a prank all along. Azi needs your help extracting the hidden message.

Input

The first line of the input contains a integer N ($1 \leq N \leq 500$) containing the number of lines in the email written by Azi.

Each of the following N lines contains a line of the email. Each line will have between 1 and 300 characters. You can assume that the first character of each line will be an upper case letter.

Output

Output a single word with the first letter of each line. The output should have N characters.

Sample Input 1

```
5
Amaro,
Personally I really enjoy working with you. You are a great adviser!
Right now I am reconsidering if a PhD program is what is best in my life.
I think my passion is in baking, and opening a bakery would use all my time.
Looking forward to seeing you around.
```

Sample Output 1

```
APRIL
```

Sample Input 2

```
10
The answer to today's homework:
First shalt thou take out the Holy Pin.
Then shalt thou count to three, no more, no less.
Three shall be the number thou shalt count, and
The number of the counting shall be three.
Four shalt thou not count, neither count thou two, excepting
That thou then proceed to three.
Five is right out. Once the number three, being the third number, be reached,
Then lobbest thou thy Holy Hand Grenade of Antioch towards
Thy foe, who, being naughty in My sight, shall snuff it.
```

Sample Output 2

```
TFTTTFTFTT
```

Sample Input 3

```
4
Hamlet and Angela, two high-school students, are leaving a Java Seminar
Angela turns to Hamlet and says "So... how did you do on the exam?"
Hamlet says, "I'm not telling you. That is private."
Angela objects, "But I thought we are in the same class."
```

Sample Output 3

```
HAHA
```

Dia da mentira
Problem ID: diadamentira

In Brazil the first day of April is known as "dia da mentira" (day of the lie), where pranks are essentially about telling lies and trying to make people to believe them.

Antonio is excited to play pranks on all of his friends, but he is not very good at it, always forgetting to actually lie. To make it worse, his keyboard is broken and the only keys working are letters and the space bar.

Can you help Antonio by replacing all occurrences of "is" with "isnt" (he means "isn't", but his apostrophe key is broken) and vice versa? Please only replace those appear as full words. See the samples below for further explanation.

Input

The input will contain a single line containing only lower case letters and spaces. There will be exactly one space between words. The line will have between 1 and 10000 characters.

Output

Output a single line where you replace all the occurrences of "is" with "isnt" and vice versa.

Sample Input 1	Sample Output 1
`my hovercraft isnt full of eels`	`my hovercraft is full of eels`

Sample Input 2

`it is dia da mentira today it isnt new years eve`

Sample Output 2

`it isnt dia da mentira today it is new years eve`

Sample Input 3

`this island is cursed and my sister eilis is under hypnosis ahhh please help`

Sample Output 3

`this island isnt cursed and my sister eilis isnt under hypnosis ahhh please help`

Sample Input 4

`pardon me but your postillion has been struck by lightning`

Sample Output 4

`pardon me but your postillion has been struck by lightning`

Prank of Digits
Problem ID: prankofdigits

Shoshana just told you that $12 + 30 = 90$. After thinking about it for a while you realized that she is playing a prank on you by changing the meaning of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.

While usually they appear in this order, with 0 standing for "zero", 1 for "one", etc., if we use 2371904856 as the meaning of the symbols (by that we mean that 2 means "zero", 3 means "one", 7 means "two", 1 means "three", 9 means "four", 0 means "five", 4 means "six", 8 means "seven", 5 means "eight", and 6 means "nine"), then Shoshana's message ($12 + 30 = 90$) means "thirty plus fifteen equals forty five", which is true.

You've decided to write a program to help you decide what Shoshana means. Because of the nature of the prank, it is considered valid to have any numbers of leading zeros in any of the numbers the might appear. The inputs guarantee there is at least one solution.

Input

The input will contain a single line with an expression of the form A+B=C, where A, B, and C are numbers with up to 9 digits each.

Output

The output should be formed by a single line containing the ten symbols in order of their meaning (starting with the symbol that means "zero" and ending with the symbol that means "nine") to make Shoshana's expression valid. If there are several possibilities output any of them.

Sample Input 1
```
12+30=90
```

Sample Output 1
```
2371904856
```

Sample Input 2
```
123+654=777
```

Sample Output 2
```
0123456789
```

Knights and Knaves
Problem ID: knightsandknaves

Saketh is on the island of Knights and Knaves[1], but since today is April Fools' Day he thinks that all the people in this island will behave as Knaves today and always lie.

Each person tells Saketh a sentence of the form "A and B", or "A and not B" or "not A and not B". A person is lying if either part (or both parts) of their statement is false. For example, if someone says "A and B" then they are lying if either A is false, or B is false (or both are false).

Saketh asked your help to know if it is possible that everybody lied to him.

Input

The input will start with a line containing a single number N ($1 \leq N \leq 1000$) indicating the number of people in the island.

Each of the following N lines will contain a sentence that a person told you. Each of these lines will have one of these forms:

- "X and Y"

- "X and not Y"

- "not X and not Y"

where "X" and "Y" is any letter of the alphabet (lower or upper case). Each letter represents a different statement (there are 52 total statements).

Output

The output should contain a single line with either the word "IMPOSSIBLE" indicating that it's impossible for all the sentences to be lies, or with a list containing all true statements. If there is more than one such list output any of them. The order of the letters in the list doesn't matter. Both "Ak" and "kA" represent the same list in which only statements "A" and "k" are true and all other 50 statements are false.

Explanation of the samples

In the first sample we can make both sentences to be lie by making A and k being true and all other 50 statements being false. The first sentence is false because b is false, and the second is false because A is true. Another possible answer is having only A being true.

The second sample makes it impossible for all four people to be lying, because for all four possible assignments of True and False to the statements w and T we will have at least one of them telling the truth.

Sample Input 1	Sample Output 1
2 A and b not A and not Y	Ak

Sample Input 2	Sample Output 2
4 w and T w and not T not w and not T T and not w	IMPOSSIBLE

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[1]https://en.wikipedia.org/wiki/Knights_and_Knaves

Prank of Bases
Problem ID: prankofbases

Zhumin was confused to get to school today and seeing everybody agreeing that $6 * 9 = 42$. After a while she realized that most likely everybody decided to use a base (also known as radix[1]) that is not the decimal base as a prank to people who got to school late (like Zhumin). In this case they are using base 13 (the expression $6 * 9 = 42$ is a true statement in base 13).

Zhumin is afraid that they may use other bases throughout the day, so she decided to ask your help to write a program to determine in which bases a particular expression can be written on.

Input

The input will contain a single line in the format EXPR1=EXPR2, where EXPR1 and EXPR2 are arithmetic expressions containing only numbers, $+$, and $*$. The expressions will not start with $+$. EXPR1 and EXPR2 have at most 17 characters each.

It is guaranteed that the input will only contain digits of $0-9$. And $*$ should be treated as having higher precedence over $+$.

Output

Output a single line with one of three possibilities:

- If there are no bases where the expression is valid the line should read "IMPOSSIBLE".

- If the expression is valid in an infinite number of bases, the line should read "X+" where X is the smallest base that makes the expression valid.

- If the expression is valid in finitely many bases, output all bases that makes it valid in increasing order.

Note that the smallest valid base is 2 (see sample 5).

Sample Input 1	Sample Output 1
`6*9=42`	`13`

Sample Input 2	Sample Output 2
`10000+3*5*334=3*5000+10+0`	`6 10`

Sample Input 3	Sample Output 3
`2+2=3`	`IMPOSSIBLE`

Sample Input 4	Sample Output 4
`2+2=4`	`5+`

Sample Input 5	Sample Output 5
`0*0=0`	`2+`

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[1] https://en.wikipedia.org/wiki/Radix