

Programming Fundamentals Final Exam Preparation 2

Problem 1. The Imitation Game

Link: <https://judge.softuni.org/Contests/Practice/Index/2525#0>

You are a mathematician during world war 2, who has joined the cryptography team to decipher the enemy's enigma code. Your job is to create a program to crack the codes.

On the first line of the input you will receive the **encrypted message**. After that, until the **"Decode"** command is given, **you will be receiving strings with instructions** for different **operations** that need to be performed upon the **concealed message to interpret it** and reveal its true content. There are several types of instructions, split by '|'

- **Move {number of letters}**
 - Moves the first n letters to the back of the string.
- **Insert {index} {value}**
 - Inserts the given value before the given index in the string.
- **ChangeAll {substring} {replacement}**
 - Changes all occurrences of the given substring with the replacement text.

Input / Constraints

- On the first line, you will receive a string with message.
- On the next lines, you will be receiving commands, split by '|'.

Output

- After the **"Decode"** command is received, print this message:
"The decrypted message is: {message}"

Examples

Input	Output
zzHe ChangeAll z l Insert 2 o Move 3 Decode	The decrypted message is: Hello
Comments	
ChangeAll z l zzHe → llHe (We replace all occurrences of 'z' with 'l') Insert 2 o llHe → lloHe (We add an 'o' before the character on index 2) Move 3	

lloHe → Hello (We take the first three characters and move them to the end of the string)

Finally, after receiving the **"Decode"** command, we print the resulting message.

Input	Output
owyouh Move 2 Move 3 Insert 3 are Insert 9 ? Decode	The decrypted message is: howareyou?

JavaScript Input	Output
['zzHe', 'ChangeAll z 1', 'Insert 2 o', 'Move 3', 'Decode']	The decrypted message is: Hello

Comments

ChangeAll|z|l

zzHe → lHe (We replace all occurrences of 'z' with 'l')

Insert|2|o

lHe → lloHe (We add an 'o' before the character on index 2)

Move|3

lloHe → Hello (We take the first three characters and move them to the end of the string)

Finally, after receiving the **"Decode"** command, we print the resulting message.

JavaScript Input	Output
['owyouh', 'Move 2', 'Move 3',]	The decrypted message is: howareyou?

'Insert 3 are', 'Insert 9 ?' 'Decode']	
--	--

Problem 2. Ad Astra

Link: <https://judge.softuni.org/Contests/Practice/Index/2525#1>

You are an astronaut who just embarked on a mission across the solar system. Since you will be in space for a long time, you have packed a lot of food with you. Create a program, which helps you identify how much food you have left and gives you information about its expiration date.

On the first line of the input you will be given a **text string**. You must extract the information about the food **and calculate the total calories**.

First you must **extract the food info**. It will always follow the same pattern rules:

- It will be surrounded by "|" or "#" (only one of the two) in the following pattern:
 #{item name}#{expiration date}#{calories}# or
 |{item name}|{expiration date}|{calories}|
- The item name will contain **only lowercase and uppercase letters and whitespace**
- The expiration date will always follow the pattern: {day}/{month}/{year}, where the day, month and year will be exactly two digits long
- The calories will be an integer between 0-10000

Calculate **the total calories of all food items** and then determine **how many days you can last with the food you have**. Keep in mind that **you need 2000kcal a day**.

Input / Constraints

- You will receive a **single string**

Output

- First print **the amount of days** you will be able to last with the food you have:
 "You have food to last you for: {days} days!"
- The output for each food item should look like this:
 "Item: {item name}, Best before: {expiration date}, Nutrition: {calories}"

Examples

Input	
#Bread#19/03/21#4000# Invalid 03/03.20 Apples 08/10/20 200 Carrots 06/08/20 500 Not right 6.8.20 5	
Output	Comments

You have food to last you for: 2 days! Item: Bread, Best before: 19/03/21, Nutrition: 4000 Item: Apples, Best before: 08/10/20, Nutrition: 200 Item: Carrots, Best before: 06/08/20, Nutrition: 500	We have a total of three matches – bread, apples and carrots. The sum of their calories is 4700. Since you need 2000kcal a day, we divide 4700/2000, which means this food will last you for 2 days. We print each item
---	---

Input

```
$$$@%&#Fish#24/12/20#8500#|#Incorrect#19.03.20#450|$5*(@!#Ice
Cream#03/10/21#9000#^#@aswe|Milk|05/09/20|2000|
```

Output	Comments
You have food to last you for: 9 days! Item: Fish, Best before: 24/12/20, Nutrition: 8500 Item: Ice Cream, Best before: 03/10/21, Nutrition: 9000 Item: Milk, Best before: 05/09/20, Nutrition: 2000	We have three matches. The total calories are 8500 + 9000 + 2000 = 19500, which means you have food for a total of 9 days.

Input

```
Hello|#Invalid food#19/03/20#450|$5*(@
```

Output	Comments
You have food to last you for: 0 days!	We have no matches, which means we have no food. The colored text is not a match, since it doesn't have a # at the end.

JavaScript Input

```
[
'#Bread#19/03/21#4000#|Invalid|03/03.20|Apples|08/10/20|200|Carrots|06/08/20|500|
Not right|6.8.20|5|'
]
```

Output	Comments
--------	----------

<p>You have food to last you for: 2 days!</p> <p>Item: Bread, Best before: 19/03/21, Nutrition: 4000</p> <p>Item: Apples, Best before: 08/10/20, Nutrition: 200</p> <p>Item: Carrots, Best before: 06/08/20, Nutrition: 500</p>	<p>We have a total of three matches – bread, apples and carrots.</p> <p>The sum of their calories is 4700. Since you need 2000kcal a day, we divide 4700/2000, which means this food will last you for 2 days.</p> <p>We print each item</p>
JavaScript Input	
<pre>['\$\$#@%&#Fish#24/12/20#8500# #Incorrect#19.03.20#450 \$5*(@!#Ice Cream#03/10/21#9000#^#@aswe Milk 05/09/20 2000 ']</pre>	
Output	Comments
<p>You have food to last you for: 9 days!</p> <p>Item: Fish, Best before: 24/12/20, Nutrition: 8500</p> <p>Item: Ice Cream, Best before: 03/10/21, Nutrition: 9000</p> <p>Item: Milk, Best before: 05/09/20, Nutrition: 2000</p>	<p>We have three matches. The total calories are 8500 + 9000 + 2000 = 19500, which means you have food for a total of 9 days.</p>
JavaScript Input	
<pre>['Hello #Invalid food#19/03/20#450 \$5*('@']</pre>	
Output	Comments
<p>You have food to last you for: 0 days!</p>	<p>We have no matches, which means we have no food.</p> <p>The colored text is not a match, since it doesn't have a # at the end.</p>

Problem 3. P!rates

Link: <https://judge.softuni.org/Contests/Practice/Index/2302#2>

Anno 1681. The Caribbean. The golden age of piracy. You are a well-known pirate captain by the name of Jack Daniels. Together with your comrades Jim (Beam) and Johnny (Walker), you have been roaming the seas, looking for gold and treasure... and the occasional killing, of course. Go ahead, target some wealthy settlements and show them the pirate's way!

Until the "Sail" command is given, you will be receiving:

- You and your crew have targeted **cities**, with their **population** and **gold**, separated by " | |".
- If you receive a city that has already been received, you have to increase the population and gold with the given values.

After the **"Sail"** command, you will start receiving lines of text representing events until the **"End"** command is given.

Events will be in the following format:

- **"Plunder=>{town}=>{people}=>{gold}"**
 - You have successfully attacked and plundered the town, killing the given number of people and stealing the respective amount of gold.
 - For every town you attack print this message: **"{town} plundered! {gold} gold stolen, {people} citizens killed."**
 - If any of those two values (population or gold) **reaches zero**, the town is disbanded.
 - You need to **remove it** from your collection of targeted cities and print the following message: **"{town} has been wiped off the map!"**
 - There will be no case of receiving more people or gold than there is in the city.
- **"Prosper=>{town}=>{gold}"**
 - There has been dramatic economic growth in the given city, **increasing its treasury** by the given amount of gold.
 - The gold amount **can be a negative number, so be careful**. If a negative amount of gold is given, print: **"Gold added cannot be a negative number!"** and ignore the command.
 - If the given gold is a valid amount, increase the town's gold reserves by the respective amount and print the following message:

"{gold added} gold added to the city treasury. {town} now has {total gold} gold."

Input

- On the first lines, until the **"Sail"** command, you will be receiving strings representing the cities with their gold and population, separated by " | |"
- On the following lines, until the **"End"** command, you will be receiving strings representing the actions described above, separated by "=>"

Output

- After receiving the **"End"** command, if there are any existing settlements on your list of targets, you need to print all of them, in the following format:

"Ahoy, Captain! There are {count} wealthy settlements to go to:

{town1} -> Population: {people} citizens, Gold: {gold} kg

{town2} -> Population: {people} citizens, Gold: {gold} kg

...

{town...n} -> Population: {people} citizens, Gold: {gold} kg"

- If there are no settlements left to plunder, print:

"Ahoy, Captain! All targets have been plundered and destroyed!"

Constraints

- The initial population and gold of the settlements will be valid 32-bit integers, never negative, or exceed the respective limits.
- The town names in the events will always be valid towns that should be on your list.

Examples

Input	Output
Tortuga 345000 1250 Santo Domingo 240000 630 Havana 410000 1100 Sail Plunder=>Tortuga=>75000=>380 Prosper=>Santo Domingo=>180 End	Tortuga plundered! 380 gold stolen, 75000 citizens killed. 180 gold added to the city treasury. Santo Domingo now has 810 gold. Ahoy, Captain! There are 3 wealthy settlements to go to: Tortuga -> Population: 270000 citizens, Gold: 870 kg Santo Domingo -> Population: 240000 citizens, Gold: 810 kg Havana -> Population: 410000 citizens, Gold: 1100 kg
Input	Output
Nassau 95000 1000 San Juan 930000 1250 Campeche 270000 690 Port Royal 320000 1000 Port Royal 100000 2000 Sail Prosper=>Port Royal=>-200 Plunder=>Nassau=>94000=>750 Plunder=>Nassau=>1000=>150 Plunder=>Campeche=>150000=>690 End	Gold added cannot be a negative number! Nassau plundered! 750 gold stolen, 94000 citizens killed. Nassau plundered! 150 gold stolen, 1000 citizens killed. Nassau has been wiped off the map! Campeche plundered! 690 gold stolen, 150000 citizens killed. Campeche has been wiped off the map! Ahoy, Captain! There are 2 wealthy settlements to go to: San Juan -> Population: 930000 citizens, Gold: 1250 kg Port Royal -> Population: 420000 citizens, Gold: 3000 kg

JS Examples

Input	Output
<pre>(["Tortuga 345000 1250", "Santo Domingo 240000 630", "Havana 410000 1100", "Sail", "Plunder=>Tortuga=>75000=>380", "Prosper=>Santo Domingo=>180", "End"])</pre>	<p>Tortuga plundered! 380 gold stolen, 75000 citizens killed.</p> <p>180 gold added to the city treasury. Santo Domingo now has 810 gold.</p> <p>Ahoy, Captain! There are 3 wealthy settlements to go to:</p> <p>Tortuga -> Population: 270000 citizens, Gold: 870 kg</p> <p>Santo Domingo -> Population: 240000 citizens, Gold: 810 kg</p> <p>Havana -> Population: 410000 citizens, Gold: 1100 kg</p>
Input	Output
<pre>(["Nassau 95000 1000", "San Juan 930000 1250", "Campeche 270000 690", "Port Royal 320000 1000", "Port Royal 100000 2000", "Sail", "Prosper=>Port Royal=>-200", "Plunder=>Nassau=>94000=>750", "Plunder=>Nassau=>1000=>150", "Plunder=>Campeche=>150000=>690", "End"])</pre>	<p>Gold added cannot be a negative number!</p> <p>Nassau plundered! 750 gold stolen, 94000 citizens killed.</p> <p>Nassau plundered! 150 gold stolen, 1000 citizens killed.</p> <p>Nassau has been wiped off the map!</p> <p>Campeche plundered! 690 gold stolen, 150000 citizens killed.</p> <p>Campeche has been wiped off the map!</p> <p>Ahoy, Captain! There are 2 wealthy settlements to go to:</p> <p>San Juan -> Population: 930000 citizens, Gold: 1250 kg</p> <p>Port Royal -> Population: 420000 citizens, Gold: 3000 kg</p>