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}
 - o 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	The decrypted message is: Hello
ChangeAll z l	
Insert 2 o	
Move 3	
Decode	
Comments	

ChangeAll|z|I

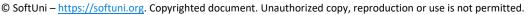
zzHe → IIHe (We replace all occurrences of 'z' with 'l')

Insert | 2 | o

IIHe \rightarrow II_OHe (We add an 'o' before the character on index 2)

Move 3



















 $HoHe \rightarrow HeHo$ (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	The decrypted message is: howareyou?
Move 2	
Move 3	
Insert 3 are	
Insert 9 ?	
Decode	

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

Comments

ChangeAll|z|l

zzHe \rightarrow IIHe (We replace all occurrences of 'z' with 'I')

Insert | 2 | o

IIHe \rightarrow IIoHe (We add an 'o' before the character on index 2)

Move | 3

lloHe \rightarrow 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
[The decrypted message is: howareyou?
'owyouh',	
'Move 2',	
'Move 3',	















```
'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

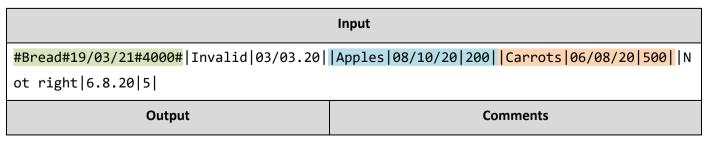
First print the amount of days you will be able to last with the food you have:

```
"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





















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

\$\$#@@%^&<mark>#Fish#24/12/20#8500#</mark>|#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,	We have three matches. The total calories are 8500 + 9000 + 2000 = 19500, which means you have food for a total of 9 days.
Nutrition: 8500 Item: Ice Cream, Best before: 03/10/21, Nutrition: 9000	Toou for a total of 9 days.
Item: Milk, Best before: 05/09/20, Nutrition: 2000	

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.

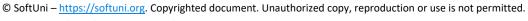
JavaScript Input

[

'#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





















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

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

JavaScript 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.

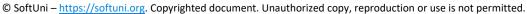
Problem 3. P!rates

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}"
 - o You have successfully attacked and plundered the town, killing the given number of people and stealing the respective amount of gold.
 - o For every town you attack print this message: "{town} plundered! {gold} gold stolen, {people} citizens killed."
 - o 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}"
 - o There has been dramatic economic growth in the given city, increasing its treasury by the given amount of gold.
 - o 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.
 - o 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!"



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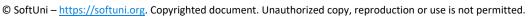
Constraints

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



