# Final Exam Preparation – 22 March 2024

## The Imitation Game

**Link:** [**https://judge.softuni.org/Contests/Practice/Index/2525#0**](https://judge.softuni.org/Contests/Practice/Index/2525#0)

*During World War 2, you are a mathematician 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 a message.
* On the following 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? |

## Fancy Barcodes

**Link:** [**https://judge.softuni.org/Contests/Practice/Index/2303#1**](https://judge.softuni.org/Contests/Practice/Index/2303#1)

Your first task is to determine if the given sequence of characters is a **valid** barcode or **not**.

**Each line must not contain anything else but a valid barcode**. A barcode is **valid** when:

* It is surrounded by a "@" followed by one or more "#"
* It is **at least 6 characters long** (without the surrounding "@" or "#")
* **It starts** with a **capital letter**
* It contains **only letters** (lower and upper case) **and digits**
* **It ends** with a **capital letter**

Examples of valid barcodes: @###Che46sE@##, @#FreshFisH@#, @###Brea0D@###, @##Che46sE@##

Examples of invalid barcodes: **##InvaliDiteM##**, **@InvalidIteM@**, **@#Invalid\_IteM@#**

Next, you have to determine the **product group** of the item from the **barcode**. The product group is obtained by **concatenating** **all the digits** found in the barcode. If there are **no digits** present in the barcode, the **default** product group is "00".

Examples:

@#FreshFisH@# -> product group: 00

@###Brea0D@### -> product group: 0

@##Che4s6E@## -> product group: 46

### Input

On the first line, you will be given an integer **n** – the count of barcodes that you will be receiving next.

On the following **n** lines, you will receive different strings.

### Output

For each barcode that you process, you need to print a message.

If the barcode is invalid:

* "Invalid barcode"

If the barcode is valid:

* "Product group: {product group}"

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 3  @#FreshFisH@#  @###Brea0D@###  @##Che4s6E@## | Product group: 00  Product group: 0  Product group: 46 |
| 6  @###Val1d1teM@###  @#ValidIteM@#  ##InvaliDiteM##  @InvalidIteM@  @#Invalid\_IteM@#  @#ValiditeM@# | Product group: 11  Product group: 00  Invalid barcode  Invalid barcode  Invalid barcode  Product group: 00 |

## Plant Discovery

**Link:** [**https://judge.softuni.org/Contests/Practice/Index/2518#2**](https://judge.softuni.org/Contests/Practice/Index/2518#2)

*You have now returned from your world tour. On your way, you have discovered some new plants, and you want to gather some information about them and create an exhibition to see which plant is highest rated.*

On the **first line,** you will receive a number **n**. On the next **n lines**, you will be given some information about the plants that you have discovered in the format: **"{plant}<->{rarity}"**. **Store** that **information** because you will need it later. If you receive a plant **more than once**, **update** its rarity.

After that, until you receive the **command** **"Exhibition"**, you will be given some of these **commands**:

* **"Rate: {plant} - {rating}"** – **add** the given **rating** to the plant (**store all ratings**)
* **"Update: {plant} - {new\_rarity}"** – **update** the **rarity** of the plant with the **new one**
* **"Reset: {plant}"** – **remove all** the **ratings** of the given plant

**Note: If any given plant name is invalid, print "error"**

After the command **"Exhibition"**, print the information that you have about the plants in the following format:

**"Plants for the exhibition:  
- {plant\_name1}; Rarity: {rarity}; Rating: {average\_rating}**

**- {plant\_name2}; Rarity: {rarity}; Rating: {average\_rating}  
…**

**- {plant\_nameN}; Rarity: {rarity}; Rating: {average\_rating}"**

The **average rating** should be formatted to the **second decimal place.**

### Input / Constraints

* You will receive the input as described above.
* JavaScript: you will receive a list of strings.

### Output

* Print the **information** about all plants as **described above.**

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 3  Arnoldii<->4  Woodii<->7  Welwitschia<->2  Rate: Woodii - 10  Rate: Welwitschia - 7  Rate: Arnoldii - 3  Rate: Woodii - 5  Update: Woodii - 5  Reset: Arnoldii  Exhibition | Plants for the exhibition:  - Arnoldii; Rarity: 4; Rating: 0.00  - Woodii; Rarity: 5; Rating: 7.50  - Welwitschia; Rarity: 2; Rating: 7.00 |
| 2  Candelabra<->10  Oahu<->10  Rate: Oahu - 7  Rate: Candelabra - 6  Exhibition | Plants for the exhibition:  - Candelabra; Rarity: 10; Rating: 6.00  - Oahu; Rarity: 10; Rating: 7.00 |