

Exercises: Associative Arrays

Problems for exercise for the ["PHP Fundamentals" course @ SoftUni](#).

You can check your solutions in [Judge](#).

1. Gold Miner

You are given a sequence of strings, each on a new line. Every odd line on the console is representing the type of the gold (e.g. Yellow, Rose, White, and so on), and its karats. Your task is to collect the resources while you receive **"stop"** and print each on a new line.

Print the resources and their quantities in format:

"{type} -> {karats}K"

The karats inputs will be in the range [1 ... 24 000]

Examples

Input	Output
White 18 Yellow 24 Green 10 stop	White -> 18K Yellow -> 24K Green -> 10K
Rose 14 White 24 Yellow 10 Rose 10 stop	Rose -> 24K White -> 24K Yellow -> 10K

2. Student Academy

Write a program, which keeps information about **students** and **their grades**.

You will receive **n pair of rows**. First you will receive the **student's name**, after that you will receive **his grade**. **Check if student already exists, and if not, add him**. Keep track of all grades for each student.

When you finish reading data, keep students with **average grade higher or equal to 4.50**. Order filtered students by **average grade in descending**.

Print the students and their average grade in format:

"{name} -> {averageGrade}"

Format the average grade to the **2nd decimal place**.

Examples

Input	Output
5 John 5.5 John 4.5 Alice 6 Alice 3 George 5	John -> 5.00 George -> 5.00 Alice -> 4.50
5 Amanda 3.5 Amanda 4 Rob 5.5 Christian 5 Robert 6	Robert -> 6.00 Rob -> 5.50 Christian -> 5.00

3. Courses

Write a program, which keeps information about **courses**. Each course has a name and registered students.

You will receive **course name** and **student name**, until you receive the command **"end"**. **Check if such course already exists, and if not, add the course**. Register the user into the course. When you do receive the command **"end"**, print the courses with their **names** and **total registered users**, ordered by the **count of registered users in descending order**. For each contest print registered users **ordered by name in ascending order**.

Input

- Until you receive **"end"**, the input come in the format: **"{courseName} : {studentName}"**.

Output

- Print information about **each course**, following the format:
"{courseName}: {registeredStudents}"
- Print information about each student, following the format:
"-- {studentName}"

Examples

Input	Output
Programming Fundamentals : John Smith Programming Fundamentals : Linda Johnson JS Core : Will Wilson Java Advanced : Harrison White end	Programming Fundamentals: 2 -- John Smith -- Linda Johnson JS Core: 1 -- Will Wilson Java Advanced: 1 -- Harrison White
Algorithms : Jay Moore Programming Basics : Martin Taylor Python Fundamentals : John Anderson Python Fundamentals : Andrew Robinson Algorithms : Bob Jackson Python Fundamentals : Clark Lewis end	Python Fundamentals: 3 -- Andrew Robinson -- Clark Lewis -- John Anderson Algorithms: 2 -- Bob Jackson -- Jay Moore Programming Basics: 1 -- Martin Taylor

4. Playing Cards

You are given a sequence of people and for every person what cards he draws from the deck. The input will be separate lines in the format:

- {personName}: {PT, PT, PT,... PT}

Where **P** (2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K, A) is the power of the card and **T** (S, H, D, C) is the type. The input ends when a "JOKER" is drawn. The name can contain any ASCII symbol except ':'. The input will always be valid and in the format described, there is no need to check it.

A single person **cannot have more than one** card with the **same power and type**, if they draw such a card they **discard** it. The people are playing with **multiple decks**. Each card has a value that is calculated by the **power multiplied by the type**. Powers 2 to 10 have the same value and J to A are 11 to 14. Types are mapped to multipliers the following way (S -> 4, H -> 3, D -> 2, C -> 1).

Finally print out the total value each player has in his hand in the format:

- {personName}: {value}

Examples

Input	Output
Pesho: 2C, 4H, 9H, AS, QS Slav: 3H, 10S, JC, KD, 5S, 10S Peshoslav: QH, QC, QS, QD Slav: 6H, 7S, KC, KD, 5S, 10C Peshoslav: QH, QC, JS, JD, JC	Pesho: 167 Slav: 175 Peshoslav: 197

Pesho: JD, JD, JD, JD, JD, JD JOKER	
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5. SoftUni Parking

SoftUni just got a new **parking lot**. It's so fancy, it even has online **parking validation**. Except, the online service doesn't work. It can only receive users' data, but doesn't know what to do with it. Good thing you're on the dev team and know how to fix it, right?

Write a program, which validates parking for an online service. Users can **register** to park and **unregister** to leave.

The program **receives 2 commands**:

- **"register {username} {licensePlateNumber}"**:
 - The system only supports **one car per user** at the moment, so if a user tries to register **another license plate**, using the **same username**, the system should print:
"ERROR: already registered with plate number {licensePlateNumber}"
 - If the aforementioned checks pass successfully, the plate can be registered, so the system should print:
"{username} registered {licensePlateNumber} successfully"
- **"unregister {username}"**:
 - If the user is **not present** in the database, the system should print:
"ERROR: user {username} not found"
 - If the aforementioned check passes successfully, the system should print:
"{username} unregistered successfully"

After you execute all of the commands, **print** all the currently **registered users** and their **license plates** in the format:

- **"{username} => {licensePlateNumber}"**

Input

- First line: **n – number of commands – integer**
- Next **n** lines: **commands** in one of **two** possible formats:
 - Register: **"register {username} {licensePlateNumber}"**
 - Unregister: **"unregister {username}"**

The input will **always** be **valid** and you **do not need** to check it explicitly.

Examples

Input	Output
5 register John CS1234JS register George JAVA123S register Andy AB4142CD register Jesica VR1223EE unregister Andy	John registered CS1234JS successfully George registered JAVA123S successfully Andy registered AB4142CD successfully Jesica registered VR1223EE successfully Andy unregistered successfully John => CS1234JS George => JAVA123S Jesica => VR1223EE

4 register Jony AA4132BB register Jony AA4132BB register Linda AA9999BB unregister Jony	Jony registered AA4132BB successfully ERROR: already registered with plate number AA4132BB Linda registered AA9999BB successfully Jony unregistered successfully Linda => AA9999BB
6 register Jacob MM1111XX register Anthony AB1111XX unregister Jacob register Joshua DD1111XX unregister Lily register Samantha AA9999BB	Jacob registered MM1111XX successfully Anthony registered AB1111XX successfully Jacob unregistered successfully Joshua registered DD1111XX successfully ERROR: user Lily not found Samantha registered AA9999BB successfully Anthony => AB1111XX Joshua => DD1111XX Samantha => AA9999BB

6. Company Users

Write a program which keeps information about companies and their employees.

You will receive **company name** and **employee's id**, until you receive the command "End". Add each employee to the given company. Keep in mind that a company cannot have two employees with the same id.

When you finish reading data, **order the companies by the name in ascending order**.

Print the company name and each employee's id in the following format:

{companyName}

-- {id1}

-- {id2}

-- {idN}

Input / Constraints

- Until you receive "End", the input come in the format: "{companyName} -> {employeeId}".
- The input always will be valid.

Examples

Input	Output
SoftUni -> AA12345	HP
SoftUni -> BB12345	-- BB12345
Microsoft -> CC12345	Microsoft
HP -> BB12345	-- CC12345
End	SoftUni
	-- AA12345
	-- BB12345
SoftUni -> AA12345	Lenovo
SoftUni -> CC12344	-- XX23456

Lenovo -> XX23456	Movement
SoftUni -> AA12345	-- DD11111
Movement -> DD11111	SoftUni
End	-- AA12345
	-- CC12344

7. Legendary Farming

You've beaten all the content and the last thing left to accomplish is own a legendary item. However, it's a tedious process and requires quite a bit of farming. Anyway, you are not too pretentious – any legendary will do.

The possible items are:

- **Shadowmourne** – requires **250 Shards**;
- **Valanyr** – requires **250 Fragments**;
- **Dragonwrath** – requires **250 Motes**;

Shards, **Fragments** and **Motes** are the **key materials**, all else is **junk**. You will be given lines of input, such as **2 motes 3 ores 15 stones**. Keep track of the **key materials** - the **first** that reaches the **250 mark wins the race**. At that point, print the corresponding legendary obtained. Then, print the **remaining** shards, fragments, motes, ordered by **quantity** in **descending** order, then by **name** in **ascending** order, each on a new line. Finally, print the collected **junk** items, in **alphabetical** order.

Input

- Each line of input is in format **{quantity} {material} {quantity} {material} ... {quantity} {material}**

Output

- On the first line, print the obtained item in format **{Legendary item} obtained!**
- On the next three lines, print the remaining key materials in descending order by quantity
 - All materials are printed in format **{material}: {quantity}**
 - If two key materials have the same quantity, print them in alphabetical order
- On the final several lines, print the junk items in alphabetical order
 - All materials are printed in format **{material}: {quantity}**
 - All output should be **lowercase**, except the first letter of the legendary

Examples

Input	Output
3 Motes 5 stones 5 Shards 6 leathers 255 fragments 7 Shards	Valanyr obtained! fragments: 5 shards: 5 motes: 3 leathers: 6 stones: 5
123 silver 6 shards 8 shards 5 motes 9 fangs 75 motes 103 MOTES 8 Shards 86 Motes 7 stones 19 silver	Dragonwrath obtained! shards: 22 motes: 19 fragments: 0 fangs: 9 silver: 123

8. Orders

Write a program, which keeps information about **products** and their **prices**. Each product has a **name**, a **price** and its **quantity**. If the product **doesn't exist** yet, **add** it with its **starting quantity**.

If you receive a product, which **already exists** **increase** its quantity by the input quantity and if its **price** is different, **replace** the price as well.

You will receive products **names**, **prices** and **quantities** on **new lines**. Until you receive the command "**buy**", keep adding items. When you do receive the command "**buy**", print the items with their **names** and **total price** of all the products with that name.

Input

- Until you receive "**buy**", the products come in the format: "{name} {price} {quantity}".
- The product data is **always** delimited by a **single space**.

Output

- Print information about **each product**, following the format: "{productName} -> {totalPrice}"
- **Format** the average grade to the **2nd decimal place**.

Examples

Input	Output
Beer 2.20 100 IceTea 1.50 50 NukaCola 3.30 80 Water 1.00 500 buy	Beer -> 220.00 IceTea -> 75.00 NukaCola -> 264.00 Water -> 500.00
Beer 2.40 350 Water 1.25 200 IceTea 5.20 100 Beer 1.20 200 IceTea 0.50 120 buy	Beer -> 660.00 Water -> 250.00 IceTea -> 110.00
CesarSalad 10.20 25 SuperEnergy 0.80 400 Beer 1.35 350 IceCream 1.50 25 buy	CesarSalad -> 255.00 SuperEnergy -> 320.00 Beer -> 472.50 IceCream -> 37.50

9. *ForceBook

The force users are struggling to remember which side are the different forceUsers from, because they switch them too often. So you are tasked to create a web application to manage their profiles. You should store information for every **unique forceUser**, registered in the application.

You will receive **several input lines** in one of the following formats:

{forceSide} | {forceUser}

{forceUser} -> {forceSide}

The **forceUser** and **forceSide** are strings, containing any character.

If you receive **forceSide | forceUser** you should **check if such forceUser already exists**, and **if not, add** him/her to the corresponding side.

If you receive a **forceUser -> forceSide** you should check if there is such **forceUser** already and if so, **change his/her side**. If there is no such **forceUser**, add him/her to the corresponding **forceSide**, treating the command as **new registered forceUser**.

Then you should print on the console: "{forceUser} joins the {forceSide} side!"

You should end your program when you receive the command **"Lumpawaroo"**. At that point you should print each force side, **ordered descending by forceUsers count, than ordered by name**. For each side print the **forceUsers, ordered by name**.

In case there are **no forceUsers in a side**, you **shouldn't print** the side information.

Input / Constraints

- The input comes in the form of commands in one of the formats specified above.
- The input ends when you receive the command **"Lumpawaroo"**.

Output

- As output for each **forceSide**, **ordered descending by forceUsers count, then by name**, you must print all the **forceUsers, ordered by name alphabetically**.
- The output format is:

Side: {forceSide}, Members: {forceUsers.Count}

! {forceUser}

! {forceUser}

! {forceUser}

- In case there are **NO forceUsers**, don't print this side.

Examples

Input	Output	Comments
Light Gosho Dark Pesho Lumpawaroo	Side: Dark, Members: 1 ! Pesho Side: Light, Members: 1 ! Gosho	We register Gosho in the Light side and Pesho in the Dark side. After receiving "Lumpawaroo" we print both sides, ordered by membersCount and then by name.

Lighter Royal Darker DCay Ivan Ivanov -> Lighter DCay -> Lighter Lumpawaroo	Ivan Ivanov joins the Lighter side! DCay joins the Lighter side! Side: Lighter, Members: 3 ! DCay ! Ivan Ivanov ! Royal	Although Ivan Ivanov doesn't have profile, we register him and add him to the Lighter side. We remove DCay from Darker side and add him to Lighter side. We print only Lighter side because Darker side has no members .
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10. SoftUni Exam Results

Judge statistics on the last Programming Fundamentals exam was not working correctly, so you have the task to take all the submissions and analyze them properly. You should collect all the submission and print the final results and statistics about each language that the participants submitted their solutions in.

You will be receiving lines in the following format: **"{username}-{language}-{points}"** until you receive **"exam finished"**. You should store each username and his submissions and points.

You can receive a **command to ban** a user for cheating in the following format: **"{username}-banned"**. In that case, you should **remove** the user from the contest, but **preserve his submissions in the total count of submissions for each language**.

After receiving **"exam finished"** print each of the participants, ordered descending by their max points, then by username, in the following format:

Results:

{username} | {points}

...

After that print each language, used in the exam, ordered descending by total submission count and then by language name, in the following format:

Submissions:

{language} - {submissionsCount}

...

Input / Constraints

Until you receive "exam finished" you will be receiving participant submissions in the following format: **"{username}-{language}-{points}"**.

You can receive a ban command -> **"{username}-banned"**

The points of the participant will always be a **valid integer in the range [0-100]**;

Output

- Print the exam results for each participant, ordered descending by max points and then by username, in the following format:

Results:

{username} | {points}

...

- After that print each language, ordered descending by total submissions and then by language name, in the following format:

Submissions:

{language} - {submissionsCount}

...

- Allowed working time / memory: 100ms / 16MB.

Examples

Input	Output	Comment
Pesho-Java-84 Gosho-C#-70 Gosho-C#-84 Kiro-C#-94 exam finished	Results: Kiro 94 Gosho 84 Pesho 84 Submissions: C# - 3 Java - 1	When receiving Gosho for second time, we keep the better result. We order the participant descending by max points and then by name, printing only the username and the max points. After that we print each language along with the count of submissions, ordered descending by submissions count, and then by language name.
Pesho-Java-91 Gosho-C#-84 Kiro-JavaScript-90 Kiro-C#-50 Kiro-banned exam finished	Results: Pesho 91 Gosho 84 Submissions: C# - 2 Java - 1 JavaScript - 1	Kiro is banned so he is removed from the contest, but he's submissions are still preserved in the languages submissions count. So althou there are only 2 participants in the results, there are 4 submissions in total.