# More Exercise: Dictionaries

Additional exercises for the [Python Fundamentals Course @SoftUni](https://softuni.bg/trainings/4222/programming-fundamentals-with-python-september-2023).

Submit your solutions in the SoftUni judge system at <https://judge.softuni.org/Contests/1738>.

***Note: All the exercises are excluded from your homework!***

## Ranking

Here comes the final and the most interesting part – the Final ranking of the candidate-interns. The final ranking is determined by the points of the interview tasks and by the points from the exams in SoftUni. Here is your final task. You will receive some lines of input in the format **"{contest}:{password for contest}"** until you receive **"end of contests"**. Save that data because **you will need it later**. After that you will receive other type of inputs in format **"{contest}=>{password}=>{username}=>{points}"** until you receive **"end of submissions"**. Here is what you need to do.

* Check if the **contest is valid (It is considered valid if you received it in the first type of input)**
* Check if the **password is correct for the given contest**
* If the contest and the password is valid, save the user with the contest they take part in **(a user can take part in many contests)** and the points the user has in the given contest. If you receive the **same contest and the same user update the points only if the new ones are more than the older ones.**

In the end, you should print the info for the user with the **most points** (total points for all contents they participated in) in the format **"Best candidate is {user} with total {total\_points} points."**. After that print **all students ordered by their names**. **For each user print each contest with the points in descending order**. See the examples.

### Input

* Strings in format **"{contest}:{password for contest}"** until the **"end of contests"** command. There will be no case with two equal contests
* Strings in format **"{contest}=>{password}=>{username}=>{points}"** until the **"end of submissions"** command.
* **There will be no case with 2 or more users with same total points!**

### Output

* On the first line, print the best user in format **"Best candidate is {user} with total {total points} points."**.
* Then print all students ordered as mentioned above in format:

**"{user\_name1}**

**# {contest1} -> {points}**

**# {contest2} -> {points}**

**…**

**# {contestN} -> {points}"**

### Constraints

* The strings may contain any ASCII character except from **(:, =, >).**
* The numbers will be in range **[0 - 10000].**
* Second input is always valid.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| Part One Interview:success  JS Fundamentals:fundExam  C# Fundamentals:fundPass  Algorithms:fun  end of contests  C# Fundamentals=>fundPass=>Tanya=>350  Algorithms=>fun=>Tanya=>380  Part One Interview=>success=>Nikola=>120  Java Basics Exam=>wrong\_pass=>Teo=>400  Part One Interview=>success=>Tanya=>220  OOP Advanced=>password123=>Kay=>231  C# Fundamentals=>fundPass=>Tanya=>250  C# Fundamentals=>fundPass=>Nikola=>200  JS Fundamentals=>fundExam=>Tanya=>400  end of submissions | Best candidate is Tanya with total 1350 points.  Ranking:  Nikola  # C# Fundamentals -> 200  # Part One Interview -> 120  Tanya  # JS Fundamentals -> 400  # Algorithms -> 380  # C# Fundamentals -> 350  # Part One Interview -> 220 |
| Java Advanced:funpass  Part Two Interview:success  Math Concept:asdasd  Java Web Basics:forrF  end of contests  Math Concept=>ispass=>Monika=>290  Java Advanced=>funpass=>Simona=>400  Part Two Interview=>success=>Drago=>120  Java Advanced=>funpass=>Petyr=>90  Java Web Basics=>forrF=>Simona=>280  Part Two Interview=>success=>Petyr=>0  Math Concept=>asdasd=>Drago=>250  Part Two Interview=>success=>Simona=>200  end of submissions | Best candidate is Simona with total 880 points.  Ranking:  Drago  # Math Concept -> 250  # Part Two Interview -> 120  Petyr  # Java Advanced -> 90  # Part Two Interview -> 0  Simona  # Java Advanced -> 400  # Java Web Basics -> 280  # Part Two Interview -> 200 |

## Judge

You know the judge system, right?! Your job is to create a program similar to the Judge system.

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

"{username} -> {contest} -> {points}"

The "contest" and "username" are strings, the given **"points"** will be an integer number. You need to keep track of **every contest** and **points of each user**:

* If the **user** has **already participated** in the contest, **update their points** **only if the new ones are more than the older ones**.
* Otherwise, just **save the data** - contest, username, and points.

Also, you need to keep **individual statistics** for each **user** -his/her final **total points for all contests.**

You should end your program when you receive the command "no more time". At that point, you should print each contest in **order of input**, for each contest print the participants **ordered by points in descending order, then ordered by name in ascending order**. After that, you should print **individual statistics for every participant** ordered by **total points** in **descending** **order**, and **then by alphabetical order**.

### Input / Constraints

* The input comes in the form of commands in one of the formats specified above.
* Username and contest name **always will be one word**.
* Points will be an integer in the **range [0, 1000]**.
* There will be **no invalid** input lines.
* If **all sorting criteria fail**, the order should be by **order** of **input**.
* The input ends when you receive the command "no more time".

### Output

* The output format for the contests is:

"{constest\_name}: {number\_participants} participants

1. {username1} <::> {points}

2. {username2} <::> {points}

…

{N}. {usernameN} <::> {points}"

* After you print all contests, print the **individual statistics for every participant.**
* The output format is:

"Individual standings:

1. {username1} -> {total\_points}
2. {username} -> {total\_points}

…

{N}. {username} -> {total\_points}"

### Examples

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| --- | --- |
| **Input** | **Output** |
| Peter -> Algo -> 400  George -> Algo -> 300  Simo -> Algo -> 200  Peter -> DS -> 150  Mariya -> DS -> 600  no more time | Algo: 3 participants  1. Peter <::> 400  2. George <::> 300  3. Simo <::> 200  DS: 2 participants  1. Mariya <::> 600  2. Peter <::> 150  Individual standings:  1. Mariya -> 600  2. Peter -> 550  3. George -> 300  4. Simo -> 200 |
| Peter -> OOP -> 350  George -> OOP -> 250  Simo -> Advanced -> 600  George -> OOP -> 300  Prakash -> OOP -> 300  Prakash -> Advanced -> 250  Ani -> JSCore -> 400  no more time | OOP: 3 participants  1. Peter <::> 350  2. George <::> 300  3. Prakash <::> 300  Advanced: 2 participants  1. Simo <::> 600  2. Prakash <::> 250  JSCore: 1 participants  1. Ani <::> 400  Individual standings:  1. Simo -> 600  2. Prakash -> 550  3. Ani -> 400  4. Peter -> 350  5. George -> 300 |

## MOBA Challenger

You are a pro MOBA player, you are struggling to become а master of the Challenger tier. So, you carefully watch the statistics in the tier.

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

"{player} -> {position} -> {skill}"

"{player} vs {player}"

The **"**player**"** and **"**position**"** are strings, and the given **"skill"** will be an integer number. You need to keep track of **every player**.

When you receive a **player with his position and skill**, add him to the players' pool, if he isn`t present, **else add** his position and skill **or update** his skill, only if the current position skill is lower than the new value.

If you receive **"{player} vs {player}"** and **both players exist** in the tier, **they duel** with the following rules:

* **If they got at least one position in common**, the player with better **total skill points** wins and the other is **demoted** from the tier -> remove him.
* If they have same total skill points at the same positions, **the duel is tie** and they both continue in the Season.
* If they don`t have positions in common, **the duel isn`t happening** and both continue in the Season.

You should end your program when you receive the command "Season end". At that point you should print the players, **ordered by total skill in descending order, then ordered by player name in ascending order**. **For each** player print their position and skill, **ordered descending by skill, then ordered by position name in ascending order.**

### Input / Constraints

* The input comes in the form of commands in one of the formats specified above.
* Player and position **will always be one word string, containing no whitespaces**.
* Skill will be an **integer** in the **range [0, 1000]**.
* There will be **no invalid** input lines.
* The program ends when you receive the command "Season end".

### Output

* The output format for each player is:

"{player}: {total\_skills} skill"

- {position1} <::> {skill}

- {position2} <::> {skill}

…

- {positionN} <::> {skill}"

### Examples

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| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| Peter -> Adc -> 400  George -> Jungle -> 300  Simon -> Mid -> 200  Simon -> Support -> 250  Season end | Simon: 450 skill  - Support <::> 250  - Mid <::> 200  Peter: 400 skill  - Adc <::> 400  George: 300 skill  - Jungle <::> 300 | We order the players by total skill points descending, then by name. We print every position along its skill ordered descending by skill, then by position name. |
| Peter -> Adc -> 400  Bush -> Tank -> 150  Frank -> Mid -> 200  Frank -> Support -> 250  Frank -> Tank -> 250  Peter vs Frank  Frank vs Bush  Frank vs Hide  Season end | Frank: 700 skill  - Support <::> 250  - Tank <::> 250  - Mid <::> 200  Peter: 400 skill  - Adc <::> 400 | Frank and Peter don`t have common position, so the duel isn`t valid.  Frank wins vs Bush /common position: "Tank". Bush is demoted.  Hide doesn`t exist so the duel isn`t valid.  We print every player left in the tier. |

## Snow White

*Snow White loves her dwarfs, but there are so many, and she doesn't know how to order them. Does she order them by name? Or by color of their hat? Or by physics? She can't decide, so it's up to you to write a program that does it for her.*

You will be receiving **several input lines** which contain **data** about each **dwarf** in the following format:

{dwarf\_name} <:> {dwarf\_hat\_color} <:> {dwarf\_physics}

The "dwarf\_name" and the "dwarf\_hat\_color" are **strings**. The "dwarf\_physics" is an **integer**.

You must **store** the data about the **dwarfs** in your program. There are several rules though:

* If **2 dwarfs** have the **same name** but **different color**, they should be **considered different dwarfs**, and you should store them **both**.
* If **2 dwarfs** have the **same name** and the **same color**, **store** the **one** with the **higher physics**.

When you receive the command "Once upon a time", the input ends. You must **order** the **dwarfs** by **physics** in **descending order** and thenby **total** **count** of **dwarfs** with the **same hat color** in **descending order**.   
Then you must print them all.

### Input

* The input will consist of **several input lines**, containing **dwarf data** in the format, specified above.
* The input **ends** when you receive the command "Once upon a time".

### Output

* As output, you must print the **dwarfs**, **ordered** in the way, specified above.
* The output format is: "({hat\_color}) {name} <-> {physics}"

### Constraints

* The "dwarf\_name" will be a **string** which may contain **any ASCII** character except ' ' (space), '<', ':', '>'.
* The "dwarf\_hat\_color" will be a **string** which may contain **any ASCII** character except ' ' (space), '<', ':', '>'.
* The "dwarf\_physics" will be an **integer** in **range [0, 231 – 1]**.
* There will be **no invalid** input lines.
* If **all sorting criteria fail**, the order should be by **order** of **input**.
* Allowed working **time** / **memory**: **100ms** / **16MB**.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| Peter <:> Red <:> 2000  Teodor <:> Blue <:> 1000  George <:> Green <:> 1000  Simon <:> Yellow <:> 4500  Dopey <:> Simon <:> 1000  Once upon a time | (Yellow) Simon <-> 4500  (Red) Peter <-> 2000  (Blue) Teodor <-> 1000  (Green) George <-> 1000  (Simon) Dopey <-> 1000 |
| Grumpy <:> Red <:> 5000  Grumpy <:> Blue <:> 10000  Grumpy <:> Red <:> 10000  Happy <:> Blue <:> 10000  Once upon a time | (Blue) Grumpy <-> 10000  (Blue) Happy <-> 10000  (Red) Grumpy <-> 10000 |

## Dragon Army

*Heroes III is the best game ever. Everyone loves it and everyone plays it all the time. Simon is no exclusion to this rule. His favorite units in the game are all* ***types*** *of dragons – black, red, gold, azure etc. He likes them so much that he gives them* ***names*** *and keeps logs of their* ***stats****:* ***damage, health,*** *and* ***armor****. The process of aggregating all the data is quite tedious, so he would like to have a program doing it. Since he is no programmer, it's your task to help him.*

You need to categorize dragons by their **type**. For each dragon, identified by **name,** keep information about his **stats (damage, health,** and **armor)**. Type is **preserved** as in the order of input, but dragons are **sorted** alphabetically by their name. For each type, you should also print the average **damage**, **health,** and **armor** of the dragons. For each dragon, print **his own stats**.

There **may** be **missing** stats in the input, though. If a stat is missing you should assign it default values. Default values are as follows: health **250**, damage **45**, and armor **10**. Missing stat will be marked by **"null"**.

The input is in the following format **"{type} {name} {damage} {health} {armor}"**.

The "type" and the "name" are **strings**. The "damage", the "**health**", and the "**armor**" are **integers**. Any of the integers may be assigned **"null"** value. See the examples below for better understanding of your task.

If the same dragon is added a second time, the new stats should **overwrite** the previous ones. Two dragons are considered **equal** if they match by **both** **name** and **type**.

### Input

* On the **first** line, you are given **number N** -> the number of dragons to follow.
* On the **next N** lines, you are given input in the above-described format. There will be a **single space** separating each element.

### Output

* Print the aggregated data on the console.
* For each **type**, print **average stats** of its **dragons** in format "**{type}::({damage}/{health}/{armor})"**.
* **Damage**, **health**, and **armor** should be rounded to **two digits** after the decimal separator.
* For each **dragon**, print **its stats** in format **"-{Name} -> damage: {damage}, health: {health}, armor: {armor}"**.

### Constraints

* N is in range [1…100].
* The dragon type and name are one word only, starting with capital letter.
* Damage health and armor are integers in range [0 … 100000] or **null.**

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 5  Red Bazgargal 100 2500 25  Black Dargonax 200 3500 18  Red Obsidion 220 2200 35  Blue Kerizsa 60 2100 20  Blue Algordox 65 1800 50 | Red::(160.00/2350.00/30.00)  -Bazgargal -> damage: 100, health: 2500, armor: 25  -Obsidion -> damage: 220, health: 2200, armor: 35  Black::(200.00/3500.00/18.00)  -Dargonax -> damage: 200, health: 3500, armor: 18  Blue::(62.50/1950.00/35.00)  -Algordox -> damage: 65, health: 1800, armor: 50  -Kerizsa -> damage: 60, health: 2100, armor: 20 |
| 4  Gold Zzazx null 1000 10  Gold Traxx 500 null 0  Gold Xaarxx 250 1000 null  Gold Ardrax 100 1055 50 | Gold::(223.75/826.25/17.50)  -Ardrax -> damage: 100, health: 1055, armor: 50  -Traxx -> damage: 500, health: 250, armor: 0  -Xaarxx -> damage: 250, health: 1000, armor: 10  -Zzazx -> damage: 45, health: 1000, armor: 10 |