# Exercise: Objects and Classes

Problems for exercises and homework for the ["Technology Fundamentals" course @ SoftUni](https://softuni.bg/courses/technology-fundamentals).

You can check your solutions here: <https://judge.softuni.bg/Contests/1215>

## Advertisement Message

Write a program that **generate random fake advertisement message** to extol some product. The messages must consist of 4 parts: **laudatory** **phrase** + **event** + **author** + **city**. Use the following predefined parts:

* **Phrases** – {"Excellent product.", "Such a great product.", "I always use that product.", "Best product of its category.", "Exceptional product.", "I can’t live without this product."}
* **Events** – {"Now I feel good.", "I have succeeded with this product.", "Makes miracles. I am happy of the results!", "I cannot believe but now I feel awesome.", "Try it yourself, I am very satisfied.", "I feel great!"}
* **Authors** – {"Diana", "Petya", "Stella", "Elena", "Katya", "Iva", "Annie", "Eva"}
* **Cities** – {"Burgas", "Sofia", "Plovdiv", "Varna", "Ruse"}

The format of the output message is: **{phrase} {event} {author} – {city}**.

As an input, you take the **number of messages** to be generated. Print each random message at a separate line.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 3 | Such a great product. Now I feel good. Elena – Ruse  Excelent product. Makes miracles. I am happy of the results! Katya – Varna  Best product of its category. That makes miracles. Eva - Sofia |

## Articles

Create an article class with the following properties:

* **Title** – a string
* **Content** – a string
* **Author** – a string

The class should have a constructor and the following methods:

* **Edit (new content**) – change the old content with the new one
* **ChangeAuthor (new author)** – change the author
* **Rename (new title)** – change the title of the article
* override **ToString** – print the article in the following format: **"{title} - {content}: {autor}"**

Write a program that reads an article in the following format **"{title}, {content}, {author}"**. On the next line, you will get a number **n**. On the next **n lines,** you will get one of the following commands: **"Edit: {new content}"**; **"ChangeAuthor: {new author}"**; **"Rename: {new title}"**. At the end, print the final article.

### Example

|  |  |
| --- | --- |
| **Input** | **Output** |
| some title, some content, some author  3  Edit: better content  ChangeAuthor: better author  Rename: better title | better title - better content: better author |

## Articles 2.0

Change the program, so you can store a **list of articles**. You will not need the methods any more (**except the ToString method**). On the **first line**, you will get a number **n**. On the **next n lines**, you will get some **articles in the same format** as the previous task (**"{title}, {content}, {author}"**). Finally, you will get one of the **three inputs**: **"title", "content", "author"**. You need to **order the articles** alphabetically based on the command and **print them sorted by the given criteria**.

### Example

|  |  |
| --- | --- |
| **Input** | **Output** |
| 2  Science, planets, Bill  Article, content, Johnny  title | Article - content: Johnny  Science - planets: Bill |
| 3  title1, C, author1  title2, B, author2  title3, A, author3  content | title3, A, author3  title2, B, author2  title1, C, author1 |

## Students

Write a program that receives a **n count of students** and **orders them by grade** (in **descending**). Each student should have **First name** (string), **Last name** (string) and **grade** (floating-point number).

### Input

* First line will be a number **n**
* Next n lines you will get a student info in the format **"{first name} {second name} {grade}"**

### Output

* Print each student in the following format **"{first name} {second name}: {grade}"**

### Example

|  |  |
| --- | --- |
| **Input** | **Output** |
| 4  Lakia Eason 3.90  Prince Messing 5.49  Akiko Segers 4.85  Rocco Erben 6.00 | Rocco Erben: 6.00  Prince Messing: 5.49  Akiko Segers: 4.85  Lakia Eason: 3.90 |

## Teamwork projects

It's time for teamwork projects and you are responsible for making the teams. First you will receive an integer - the **count** of the teams you will have to **register**. You will be given a **user** and a **team** (separated with “-”). The user is the **creator** of that team.

For every newly created team you should **print** a message: "Team {team Name} has been created by {user}!".

Next you will receive user with team (separated with "*->*") which means that the user wants to **join** that **team**. Upon receiving the command: “end of assignment”, you should print **every team**, **ordered** by the **count** of its **members** (**descending**) and then by **name** (**ascending**). For each team (disband teams as well), you have to print its members **sorted** by name (**ascending**). However, there are several **rules**:

* If user tries to **create** a team more than once a message should be displayed:
  + "Team {teamName} was already created!*"*
* Creator of a team cannot **create** another team - message should be thrown:
  + "{user} cannot create another team!"
* If user tries to **join** currently non-existing team a message should be displayed:
  + "Team {teamName} does not exist!*"*
* Member of a team cannot **join** another team - message should be thrown:
  + "Member {user} cannot join team {team Name}!"
* In the **end** (*after teams' report*) teams with **zero** members (with **only a creator**) should **disband ordered by name in ascending other**.
* Every **valid** team should be printed ordered by **name** (ascending) in this format:

|  |
| --- |
| "{teamName}:  - {creator}  -- {member}…" |

### Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| 2  Didi-PowerPuffsCoders  Toni-Toni is the best  Petq->PowerPuffsCoders  Toni->Toni is the best  end of assignment | Team PowerPuffsCoders has been created by Didi!  Team Toni is the best has been created by Toni!  Member Toni cannot join team Toni is the best!  PowerPuffsCoders  - Didi  -- Petq  Teams to disband:  Toni is the best | Toni created a team in which he tried later to join. So message was shown. Since there is no one other who is trying to join his team the team have to **disband**. |
| 3  Tatyana-CloneClub  Helena-CloneClub  Trifon-AiNaBira  Pesho->aiNaBira  Pesho->AiNaBira  Tatyana->Leda  PeshO->AiNaBira  Cossima->CloneClub  end of assignment | Team CloneClub has been created by Tatyana!  Team CloneClub was already created!  Team AiNaBira has been created by Trifon!  Team aiNaBira does not exist!  Team Leda does not exist!  AiNaBira  - Trifon  -- Pesho  -- PeshO  CloneClub  - Tatyana  -- Cossima  Teams to disband: | Note that when you join a team you should check **first** if it exists, **then** check if the user is already in a team:  Tatyana has created CloneClub, then she tries to join a non-existing team – so message for non-existing team is shown. |

## Vehicle Catalogue

You have to make a catalogue for vehicles. You will receive two types of vehicle – **car** or **truck**.

Until you receive the command “**End**” you will receive **lines** of **input** in the format:

|  |
| --- |
| {typeOfVehicle} {model} {color} {horsepower} |

After the “**End**” command, you will start receiving **models** of **vehicles**. Print for every received vehicle its **data** in the format:

|  |
| --- |
| Type: {typeOfVehicle}  Model: {modelOfVehicle}  Color: {colorOfVehicle}  Horsepower: {horsepowerOfVehicle} |

When you receive the command “**Close the Catalogue**”, stop receiving input and print the **average** **horsepower** for the **cars** and for the **trucks** in the format:

{typeOfVehicles} have average horsepower of {averageHorsepower}.

The **average** **horsepower** is calculated by **dividing** the **sum** of **horsepower** for **all** vehicles of the type by the **total** **count** of **vehicles** from the **same** **type**.

Format the answer to the **2nd decimal point**.

### Constraints

* The type of vehicle will always be **car** or **truck**.
* You will not receive the **same** **model** **twice**.
* The received horsepower will be integer in the interval **[1…1000]**
* You will receive at most **50** vehicles.
* **Single** whitespace will be used for **separator**.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| truck Man red 200  truck Mercedes blue 300  car Ford green 120  car Ferrari red 550  car Lamborghini orange 570  End  Ferrari  Ford  Man  Close the Catalogue | Type: Car  Model: Ferrari  Color: red  Horsepower: 550  Type: Car  Model: Ford  Color: green  Horsepower: 120  Type: Truck  Model: Man  Color: red  Horsepower: 200  Cars have average horsepower of: 413.33.  Trucks have average horsepower of: 250.00. |

## Order by Age

You will receive an **unknown** number of lines. On each line, you will receive array with **3** elements. **The first** element will be string and represents the name of the person. **The second** element will be a **string** and will represent the **ID** of the person. **The last** element will be an **integer** and represents the **age** of the person.

When you receive the command “**End**”, stop taking input and print **all the** **people**, **ordered** by **age**.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| Georgi 123456 20  Pesho 78911 15  Stefan 524244 10  End | Stefan with ID: 524244 is 10 years old.  Pesho with ID: 78911 is 15 years old.  Georgi with ID: 123456 is 20 years old. |