**Exercise: Objects and Classes**

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

You can check your solutions in [Judge.](https://judge.softuni.bg/Contests/1327)

* **Advertisement Message**

Write a program that **generates 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 on 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}:{author}"**

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 |

* **Opinion Poll**

Using the Person class, write a program that reads from the console **N** lines of personal information and then prints all people whose **age** is **more than 30** years, **sorted in alphabetical order**.

**Note**: you can use **stream()** to filter people.

**Examples**

|  |  |
| --- | --- |
| **Input** | **Output** |
| 3  Pesho 12  Stamat 31  Ivan 48 | Ivan - 48  Stamat – 31 |
| 5  Nikolai 33  Yordan 88  Tosho 22  Lyubo 44  Stanislav 11 | Lyubo - 44  Nikolai - 33  Yordan – 88 |

* **Articles 2.0**

Change the program from the second problem, so you can store a **list of articles**. You will not need the methods anymore (**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 **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 |

* **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 an 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** which 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. |