# More Exercises: Objects, Classes, Files and Exceptions

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

Check your solutions [here](https://judge.softuni.bg/Contests/Compete/Index/584).

# Objects and Classes

## 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

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| --- | --- |
| **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. |

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| **Input** | **Output** |
| Maria 123456 120  Georgi 31241 50  Denis 41231 23  End | Denis with ID: 41231 is 23 years old.  Georgi with ID: 31241 is 50 years old.  Maria with ID: 123456 is 120 years old. |

### Hints

* For C#, you can use .OrderBy(…) from System.Linq to specify according to which parameter to order the people.
* For Java, you can do the same with .sorted(…)from **Stream API**.

## 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:

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| {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:

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| --- |
| 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

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| **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. |

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| **Input** | **Output** |
| Car Skoda grey 90  car Nissan black 90  car Bugatti blue 1000  End  Skoda  Close the Catalogue | Type: Car  Model: Skoda  Color: grey  Horsepower: 90  Cars have average horsepower of: 393.33.  Trucks have average horsepower of: 0.00. |

## \* Jarvis

Every kid’s dream is to have its own personal robot to be their butler and/or slave. Until now, we could not build a fully functional robot, but we can write a program, which simulates what it would be like to build. Let’s call him a code name – **Jarvis**.

Our robot will consist of **6** components – **2** arms, **2** legs, **torso** and a **head**. Make **classes** for these components and your robot should have **fields** for **each** of the **components**.

**Each** component has **different** properties:

* Arms have:
  + Energy consumption **(integer)**
  + Arm reach distance **(integer)**
  + Count of fingers **(integer)**
* Legs have:
  + Energy consumption **(integer)**
  + Strength **(integer)**
  + Speed **(integer)**
* Torso has:
  + Energy consumption **(integer)**
  + Processor size in centimeters **(double)**
  + Housing material **(string)**
* Head has:
  + Energy consumption **(integer)**
  + IQ **(integer)**
  + Skin material **(string)**

On the first line, you will receive the **maximum** **energy capacity** of the **robot**. **Until** you receive the command “**Assemble!**”, you will continuously receive lines with data for **different** components in format:

{typeOfComponent} {energyConsumption} {property1} {property2}

The properties will **always** be given in the **same** **order** as they are described above. If you receive a **component** which is more **energy** **efficient** than **previous** one – you should **delete** the old component and **replace** it with the **new** one. When **both** of the components **consume** **more** **energy** than the one, which you try to **add** 🡪 remove the **one**, which is **added** **first**.

### Input

* On the **first** line, you will receive the **maximum** **energy** **capacity** of the robot.
* Until you receive the command “**Assemble!**” you will receive components in the format:  
  {typeOfComponent} {energyConsumption} {property1} {property2}

### Output

* If you do **not** have enough **energy** **efficient** components to **assemble** the robot print:  
  “We need more power!”
* If you do not have enough parts print:  
  “We need more parts!”
* If you **can** build a **robot** with the given **components** print:

|  |
| --- |
| Jarvis:  #Head:  ###Energy consumption: {head’s energy consumption}  ###IQ: {head’s IQ}  ###Skin material: {head’s skin material}  #Torso:  ###Energy consumption: {torso’s energy consumption}  ###Processor size: {size of the processor}  ###Corpus material: {torso’s corpus material}  #Arm:  ###Energy consumption: {arm’s energy consumption}  ###Reach: {arm’s reach}  ###Fingers: {count of fingers}  #Arm:  ###Energy consumption: {arm’s energy consumption}  ###Reach: {arm’s reach}  ###Fingers: {count of fingers}  #Leg:  ###Energy consumption: {head’s energy consumption}  ###Strength: {leg’s strength}  ###Speed: {leg’s speed}  #Leg:  ###Energy consumption: {head’s energy consumption}  ###Strength: {leg’s strength}  ###Speed: {leg’s speed} |

Print the **legs** and the **feet** ordered by **energy** consumption in **ascending order**.

### Constraints

* Jarvis’ energy will be in the interval **[0…9223372036854775807]**
* Components’ energy will be in the interval **[-2147483648…2147483647]**

### Examples

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| --- | --- |
| **Input** | **Output** |
| 1000  Head 500 20 Leather  Torso 300 3 Aluminum  Leg 150 20 20  Leg 100 30 30  Arm 500 20 30  Leg 80 30 30  Arm 120 20 5  Arm 100 30 4  Head 200 20 Leather  Assemble!  1000  Arm 500 20 30  Arm 600 30 80  Arm 400 20 30  Arm 500 30 80  Assemble! | Jarvis:  #Head:  ###Energy consumption: 200  ###IQ: 20  ###Skin material: Leather  #Torso:  ###Energy consumption: 300  ###Processor size: 3.0  ###Corpus material: Aluminum  #Arm:  ###Energy consumption: 100  ###Reach: 30  ###Fingers: 4  #Arm:  ###Energy consumption: 120  ###Reach: 20  ###Fingers: 5  #Leg:  ###Energy consumption: 80  ###Strength: 30  ###Speed: 30  #Leg:  ###Energy consumption: 100  ###Strength: 30  ###Speed: 30 |

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| **Input** | **Output** |
| 5000  Leg 1000 20 30  Arm 500 30 50  Arm 500 30 20  Arm 500 30 50  Arm 300 60 80  Torso 700 30 40  Leg 200 100 100  Assemble! | We need more parts! |

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| --- | --- |
| **Input** | **Output** |
| 500  Head 500 20 Leather  Torso 300 3 Aluminum  Leg 150 20 20  Leg 100 30 30  Arm 500 20 30  Leg 80 30 30  Arm 120 20 5  Arm 100 30 4  Head 200 20 Leather  Assemble! | We need more power! |

### Hints

* You might want to override the ToString(…) method in some of your classes.