# More Exercises: 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 in [Judge](https://judge.softuni.bg/Contests/1329/).

## Oldest Family Member

Create two classes – **Family** and **Person**. The **Person** class should have **name** and **age** properties. The **Family** class should have a **list of people**, a method for adding members (**addMember($member)**) and a method returning the oldest family member(**getOldestMember()**). Write a program that reads the names and ages of **N** people and **adds them to the family**. Then **print** the **name** and **age** of the oldest member.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 3  Pesho 3  Gosho 4  Annie 5 | Annie 5 |
| 5  Steve 10  Christopher 15  Annie 4  Ivan 35  Maria 34 | Ivan 35 |

## Speed Racing

Your task is to implement a program that keeps track of cars and their fuel and supports methods for moving the cars. Define a class **Car** that keeps a track of a car’s **model, fuel amount, fuel consumption for 1 kilometer** and **traveled distance**. A Car’s model is **unique** - there will never be 2 cars with the same model.

On the first line of the input you will receive a number **N** – the number of cars you need to track, on each of the next **N** lines you will receive information about a car in the following format:

**"<Model> <FuelAmount> <FuelConsumptionFor1km>**"

All **cars start at 0 kilometers traveled**. After the **N** lines, until the command **"End"** is received, you will receive commands in the following format: **"Drive <CarModel> <amountOfKm>".** Implement a method in the **Car** class to calculate whether or not a car can move that distance. If it can, the car’s **fuel amount** should be **reduced** by the amount of **used** **fuel** and its **traveled** **distance** should be increased by the number of the **traveled kilometers**. Otherwise, the car should not move (its fuel amount and the traveled distance should stay the same) and you should print on the console "**Insufficient fuel for the drive**". After the **"End"** command is received, print **each car** and its **current fuel amount** and the **traveled** **distance** in the format:

**"<Model> <fuelAmount> <distanceTraveled>"**

Print the fuel amount rounded to **two digits** after the decimal separator.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 2  AudiA4 23 0.3  BMW-M2 45 0.42  Drive BMW-M2 56  Drive AudiA4 5  Drive AudiA4 13  End | AudiA4 17.60 18  BMW-M2 21.48 56 |
| 3  AudiA4 18 0.34  BMW-M2 33 0.41  Ferrari-488Spider 50 0.47  Drive Ferrari-488Spider 97  Drive Ferrari-488Spider 35  Drive AudiA4 85  Drive AudiA4 50  End | Insufficient fuel for the drive  Insufficient fuel for the drive  AudiA4 1.00 50  BMW-M2 33.00 0  Ferrari-488Spider 4.41 97 |

## Raw Data

You are the owner of a courier company and want to make a system for tracking your cars and their cargo. Define a class **Car** that holds an information about **model, engine** and **cargo**. The **engine** and **cargo** shouldbe **separate classes**. Create a constructor that receives all of the information about the **Car** and creates and initializes its inner components (engine and cargo).

On the first line of input you will receive a number **N** – the amount of cars you have. On each of the next **N** lines you will receive an information about a car in the format where the speed, power and weight are all **integers**:

**"<Model> <EngineSpeed> <EnginePower> <CargoWeight> <CargoType>"**

After the **N** lines you will receive a single line with one of 2 commands: **"fragile"** or **"flamable"**. If the command is **"fragile"** print all cars whose **Cargo Type is "fragile"** with **cargo** whose **weight** **< 1000**. If the command is **"flamable"** print all of the cars whose **Cargo Type is "flamable"** and have **Engine Power > 250**. The cars should be printed in order of appearing in the input.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 2  ChevroletAstro 200 180 1000 fragile  Citroen2CV 190 165 900 fragile  fragile | Citroen2CV |
| 4  ChevroletExpress 215 255 1200 flamable  ChevroletAstro 210 230 1000 flamable  DaciaDokker 230 275 1400 flamable  Citroen2CV 190 165 1200 fragile  flamable | ChevroletExpress  DaciaDokker |

## Shopping Spree

Create two classes: **class** **Person** and **class** **Product**. Each person should have a **name**, **money** and a **bag** **of products**. Each product should have a **name** and a **cost**.

Create a program in which **each command** corresponds to a **person buying a product**. If the person can **afford** a product **add** it to his bag. If a person **doesn’t have enough** money, print an **appropriate** **message**:

"{Person} can't afford {Product}"

On the **first two lines** you are given **all people** and **all products**. After all purchases print **every person** in the order of **appearance** and **all products** that he has **bought** also in order of **appearance**. If **nothing was bought**, print the name of the person followed by **"Nothing bought"**.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| Pesho=11;Gosho=4  Bread=10;Milk=2  Pesho Bread  Gosho Milk  Gosho Milk  Pesho Milk  END | Pesho bought Bread  Gosho bought Milk  Gosho bought Milk  Pesho can't afford Milk  Pesho - Bread  Gosho - Milk, Milk |
| Mimi=0  Kafence=2  Mimi Kafence  END | Mimi can't afford Kafence  Mimi – Nothing bought |

## Company Roster

Define a class **Employee** that holds the following information: **name, salary**.  
Define a class **Department** that will contains all the employees of the given department, of course don’t forget to set **department name** property ;).

Your task is to write a program which takes **N** lines of employees from the console and calculates the department with the highest average salary and prints for each employee in that department his **name and salary** – **sorted by salary in descending order**. The **salary** should be printed to **two digits** after the decimal seperator.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 4  Pesho 120.00 Development  Toncho 333.33 Marketing  Ivan 840.20 Development  Gosho 0.20 Nowhere | Highest Average Salary: Development  Ivan 840.20  Pesho 120.00 |
| 6  Stanimir 496.37 Coding  Yovcho 610.13 Sales  Toshko 609.99 Sales  Venci 0.02 BeerDrinking  Andrei 700.00 Coding  Popeye 13.3333 SpinachGroup | Highest Average Salary: Sales  Yovcho 610.13  Toshko 609.99 |

### Hints:

* Use associative array to keep all departments. **{departmentName}: {department}**
* Keep in mind you must not allow to have 2 department objects with same name.
* Create function which returns average salary of the department, it will be easier to sort the associative array