Exercises: Stream API

This document defines the exercises for "Java Advanced" course @ Software University. Please submit your solutions (source code) of all below described problems in Judge.

1. Students by Group

Print all students from group number 2. Use a Stream query. Order the students by **First Name**.

Examples

Input	Output
Sara Mills 1 Andrew Gibson 2 Craig Ellis 1 Steven Cole 2 Andrew Carter 2 END	Andrew Gibson Andrew Carter Steven Cole

2. Students by First and Last Name

Using the same input as above print all students whose first name is before their last name lexicographically. Use a Stream query. Print them in order of appearance.

Examples

Input	Output
Sara Mills Andrew Gibson Craig Ellis Steven Cole Andrew Carter END	Andrew Gibson Craig Ellis Andrew Carter

3. Students by Age

Write a Stream query that finds the first name and last name of all students with age between 18 and 24. The query should return the **first name**, **last name** and **age**. Print them in order of appearance.

Examples

Input	Output
Sara Mills 24 Andrew Gibson 21 Craig Ellis 19	Sara Mills 24 Andrew Gibson 21 Craig Ellis 19

Steven Cole 35 Andrew Carter 15 END	

4. Sort Students

Using the lambda expressions with Stream query syntax sort the students first by **last name** in **ascending** order and then by **first name** in **descending** order.

Examples

Input	Output
Sara Gibson Andrew Gibson Craig Ellis Steven Cole Andrew Ellis END	Steven Cole Craig Ellis Andrew Ellis Sara Gibson Andrew Gibson

5. Filter Students by Email Domain

Print all students that have email **@gmail.com**. Use Stream API. Print the in order of appearance.

Examples

Input	Output
Sara Mills smills@gmail.com Andrew Gibson agibson@abv.bg Craig Ellis cellis@cs.edu.gov Steven Cole themachine@abv.bg Andrew Carter ac147@gmail.com END	Sara Mills Andrew Carter

6. Filter Students by Phone

Print all students with phones in Sofia (starting with **02** / **+3592**). Use a Stream.

Examples

Input	Output
Sara Mills 02435521 Andrew Gibson 0895223344 Craig Ellis +3592667710 Steven Cole 3242133312 Andrew Carter +001234532	Sara Mills Craig Ellis

END	

7. Excellent Students

Print all students that have **at least one mark Excellent (6)**. Use a Stream.

Examples

Input	Output
Sara Mills 6 6 6 5 Andrew Gibson 3 4 5 6 Craig Ellis 4 2 3 4 Steven Cole 5 6 5 5 Andrew Carter 5 3 4 2 END	Sara Mills Andrew Gibson Steven Cole

8. Weak Students

Write a similar program to the previous one to extract the **students with at least 2 marks under or equal to "3"**. Use a Stream.

Examples

Input	Output
Sara Mills 6 6 6 5 Andrew Gibson 3 4 5 6 Craig Ellis 4 2 3 4 Steven Cole 5 6 5 5 Andrew Carter 5 3 4 2 END	Craig Ellis Andrew Carter

9. Students Enrolled in 2014 or 2015

Extract and print the **Marks** of the students that **enrolled in 2014 or 2015** (the students from 2014 have 14 as their 5-th and 6-th digit in the **FacultyNumber**, those from 2015 have 15).

Examples

Input	Output

554214 6 6 6 5
653215 3 4 5 6
156212 4 2 3 4
324413 5 6 5 5
134014 5 3 4 2
END
	6 6 6 5
	3 4 5 6
	5 3 4 2

10. * Group by Group

Create a class **Person**. It should consists of **properties** : **name** and **group** (String, Integer). Write a program that extracts all persons (students), **grouped by GroupName** and then prints them on the console. Print all group names along with the students in each group. Use the **group by** Stream operations. You will be given an input on the console.

Output format : **{group} - {name1}, {name2}, {name3}, ...**

Examples

Input	Output
Ivaylo Petrov 10 Stanimir Svilianov 3 Indje Kromidov 3 Irina Balabanova 4 END	3 - Stanimir Svilianov, Indje Kromidov 4 - Irina Balabanova 10 - Ivaylo Petrov

11. * Students Joined to Specialties

Create a new class **StudentSpecialty** that holds **specialty name** and **faculty number**. Create a **Student** class that holds **student name** and **faculty number**. Create a list of **student specialties,** where each specialty corresponds to a certain student (via the faculty number). Print all student names alphabetically along with their faculty number and specialty name.

You will recieve several specialties in format :

{specialty name} {specialty name} {faculty number}

Until you reach "Students:" , you should add specialties to the collection. After you reach "Students:", you should start reading students in format :

{faculty number} {student's first name} {student's second name}

You should add the students untill you recieve "END" command.

Examples

Student Specialties	
SpecialtyName	**FacNum**
Web Developer	203314
Web Developer	203114
PHP Developer	203814
PHP Developer	203914
QA Engineer	203314
Web Developer	203914

join

Students	
FacNum	**Name**
215314	Milena Kirova
203114	Stefan Popov
203314	Asya Manova
203914	Diana Petrova
203814	Ivan Ivanov

→

Result (Joined Students with Specialties)		
Name	**FacNum**	**Specialty**
Asya Manova	203314	Web Developer
Asya Manova	203314	QA Engineer
Diana Petrova	203914	PHP Developer
Diana Petrova	203914	Web Developer
Ivan Ivanov	203814	PHP Developer
Stefan Popov	203114	Web Developer

Input	Output
Web Developer 203314 Web Developer 203114 PHP Developer 203814 PHP Developer 203914 QA Engineer 203314 Web Developer 203914 Students: 215314 Milena Kirova 203114 Stefan Popov 203314 Asya Manova 203914 Diana Petrova 203814 Ivan Ivanov END	Asya Manova 203314 Web Developer Asya Manova 203314 QA Engineer Diana Petrova 203914 PHP Developer Diana Petrova 203914 Web Developer Ivan Ivanov 203814 PHP Developer Stefan Popov 203114 Web Developer

12. * Little John

This problem is originally from the PHP Basics Exam (3 May 2015). You may check your solution here.

As you probably know Little John is the right hand of the famous English hero - Robin Hood. A little known fact is that Little John can't handle Math very well. Before Robin Hood left to see Marry Ann, he asked John to **count** his hay of arrows and send him an **encrypted** message containing the arrow's count**.** The message should be encrypted since it can be intercepted by the Nottingham's evil Sheriff. Your task is to help Little John before it is too late (0.10 sec).

You are given **4 input** strings (hay). Those strings **may or may not** contain arrows. The arrows can be of different type as follows:

- ">----->" – a small arrow
- ">>----->" – a medium arrow
- ">>>----->>" – a large arrow

Note that the **body** of each arrow will always be **5 dashes long**. The **difference** between the arrows is in their **tip** and **tail**. The given 3 types are the only ones you should count, the **rest should be ignored** (Robin Hood does not like them). You should start searching the hays **from the largest** arrow type down **to the smallest** arrow type.

After you find the **count** of each arrow type you should **concatenate** them into one number in order: small, medium, large arrow (even if the arrow count is 0). Then you **convert** the number in **binary** representation, **reverse** it and **concatenate it again** with the initial binary representation of the number. You **convert** the final binary number again **back to decimal**. This is the encrypted message you should send to Robin Hood.

Input

The input will be read from the console. The **data** will be received from 4 input **lines containing strings**.

Output

The output should be a decimal number, representing the encrypted count of arrows.

Constraints

- The input strings will contain any ASCII character.
- Allowed working time: 0.1 seconds. Allowed memory: 16 MB.

Examples

Input	Output

`>>>----->>abc>>>----->>`
`>>----->>`
`>----->s`
`>>----->`
	`14535`
	
	The count is: 1 small, 1 medium and 3 large arrows
	113(dec) = 1110001(bin) -> reversed is 1000111(bin)
	11100011000111(bin) = 14535(dec)

13. * Office Stuff

This problem is from the Java Basics Exam (21 Sept 2014 Evening). You can test your solution here.

You are given a sequence of **n** companies in format **|<company> - <amount> - <product>|**. Example:

- |SoftUni - 600 - paper|
- |Vivacom - 600 - pen|
- |XS - 20 - chair|
- |Vivacom - 200 - chair|
- |SoftUni - 40 - chair|
- |XS - 40 - chair|
- |SoftUni - 1 - printer|

Write a program that prints **all companies** in **alphabetical** order. For each company print the product type and their aggregated ordered amounts. Order the products by **order of appearance**. **Print** the result in the following format: **<company>: <product>-<amount>, <product>-<amount>,…** For the orders above the output should be:

- SoftUni: paper-600, chair-40, printer-1
- Vivacom: pen-600, chair-200
- XS: chair-60

Input

The input comes from the console. At the first line the number **n** stays alone. At the next **n** lines, we have **n** orders in format **|<company> - <amount> - <product>|**.

The input data will always be valid and in the format described. There is no need to check it explicitly.

Output

Print **one line for each company**. Company lines should be ordered in **alphabetical order**. For each company print the **products** ordered by this company in **order** of **appearance**, along with the total amount for the given product. Each line should be in format **<company>: <product>-<amount>, <product>-<amount>, … <product>-<amount>**

Constraints

- The **count** of the lines **n** will be in the range [1 … 100].
- The **<company>** and **<product>** will consist of only of **Latin characters**, with length of [1 … 20].
- The **<amount>** will be an integer number in the range [1 … 1000].
- Time limit: 0.1 sec. Memory limit: 16 MB.

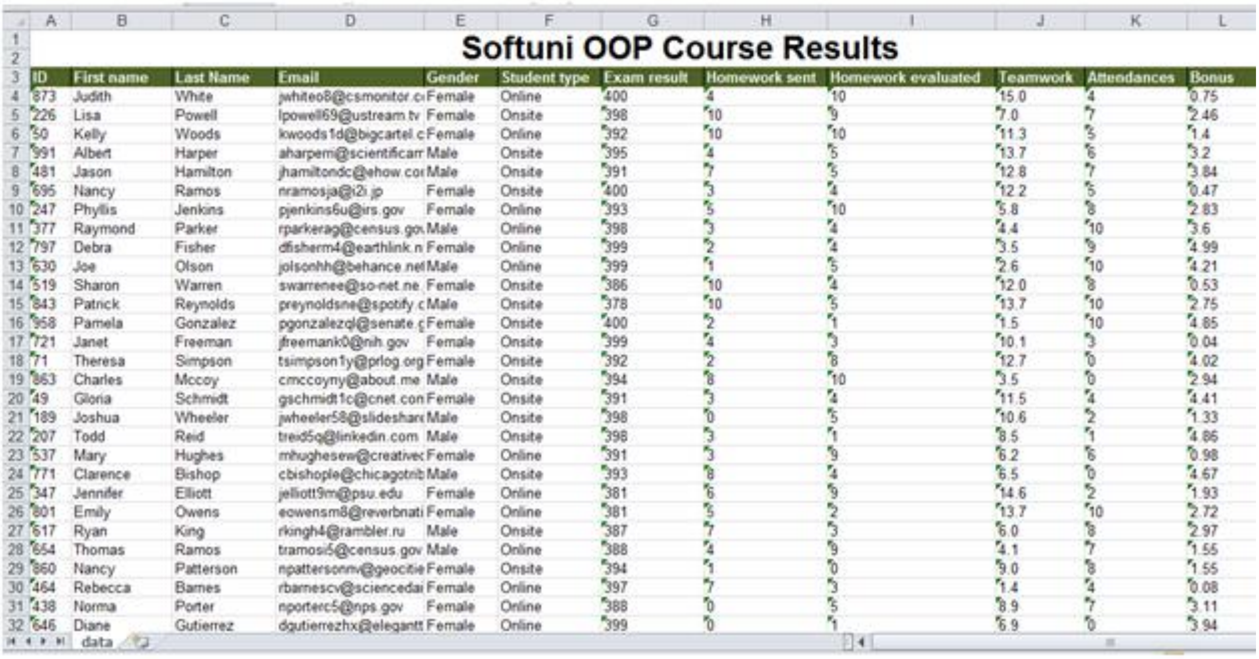
Examples

Input	Output		Input	Output
7 |SoftUni - 600 - paper| |Vivacom - 600 - pen| |XS - 20 - chair| |Vivacom - 200 - chair| |SoftUni - 40 - chair| |XS - 40 - chair| |SoftUni - 1 - printer|	SoftUni: paper-600, chair-40, printer-1 Vivacom: pen-600, chair-200 XS: chair-60		5 |SoftUni - 200 - desk| |SoftUni - 40 - PC| |SoftUni - 200 - desk| |SoftUni - 600 - paper| |SoftUni - 600 - textbook|	SoftUni: desk-400, PC-40, paper-600, textbook-600

14. ** Export to Excel

Write a program to create an Excel file like the one below using an external library. Such as Apache POI for Java.

You are given as **input** course data about **1000 students** in a **.txt** file (tab-separated values). Each line in the input holds **ID**, **first name**, **last name**, **email**, **gender**, **student type**, **exam result**, **homework sent**, **homework evaluated**, **teamwork score**, **attendances count**, **bonus**.



Softuni OOP Course Results

ID	First name	Last Name	Email	Gender	Student type	Exam result	Homework sent	Homework evaluated	Teamwork	Attendances	Bonus
873	Judith	White	jwhiteo8@csmonitor.c	Female	Online	400	4	10	15.0	4	0.75
226	Lisa	Powell	lpowell69@ustream.tv	Female	Onsite	398	10	9	7.0	7	2.46
50	Kelly	Woods	kwoods1d@bigcartel.c	Female	Online	392	10	10	11.3	5	1.4
991	Albert	Harper	aharperri@scientificam	Male	Onsite	395	4	5	13.7	6	3.2
481	Jason	Hamilton	jhamiltondc@ehow.co	Male	Onsite	391	7	5	12.8	7	3.84
695	Nancy	Ramos	nramosja@i2i.jp	Female	Onsite	400	3	4	12.2	5	0.47
247	Phyllis	Jenkins	pjenkins6u@irs.gov	Female	Online	393	5	10	5.8	8	2.83
377	Raymond	Parker	rparkerag@census.go	Male	Online	398	3	4	4.4	10	3.6
797	Debra	Fisher	dfisherm4@earthlink.n	Female	Online	399	2	4	3.5	9	4.99
630	Joe	Olson	jolsonhh@behance.ne	Male	Online	399	1	5	2.6	10	4.21
519	Sharon	Warren	swarrenee@so-net.ne	Female	Onsite	386	10	4	12.0	8	0.53
843	Patrick	Reynolds	preynoldsne@spotify.c	Male	Onsite	378	10	5	13.7	10	2.75
958	Pamela	Gonzalez	pgonzalezql@senate.g	Female	Onsite	400	2	1	1.5	10	4.85
721	Janet	Freeman	jfreemank0@nih.gov	Female	Onsite	399	4	3	10.1	3	0.04
71	Theresa	Simpson	tsimpson1y@prlog.org	Female	Onsite	392	2	8	12.7	0	4.02
863	Charles	Mccoy	cmccoyny@about.me	Male	Onsite	394	8	10	3.5	0	2.94
49	Gloria	Schmidt	gschmidt1c@cnet.con	Female	Onsite	391	3	4	11.5	4	4.41
189	Joshua	Wheeler	jwheeler58@slideshar	Male	Onsite	398	0	5	10.6	2	1.33
207	Todd	Reid	treid5q@linkedin.com	Male	Onsite	398	3	1	8.5	1	4.86
537	Mary	Hughes	mhughesew@creative	Female	Online	391	3	9	6.2	6	0.98
771	Clarence	Bishop	cbishople@chicagotrib	Male	Onsite	393	8	4	6.5	0	4.67
347	Jennifer	Elliott	jelliott9m@psu.edu	Female	Online	381	6	9	14.6	2	1.93
801	Emily	Owens	eowensm8@reverbnati	Female	Online	381	5	2	13.7	10	2.72
617	Ryan	King	rkingh4@rambler.ru	Male	Onsite	387	7	3	6.0	8	2.97
654	Thomas	Ramos	tramosi5@census.gov	Male	Online	388	4	9	4.1	7	1.55
860	Nancy	Patterson	npattersonmv@geocitie	Female	Onsite	394	1	0	9.0	8	1.55
464	Rebecca	Barnes	rbarnescv@sciencedai	Female	Online	397	7	3	1.4	4	0.08
438	Norma	Porter	nporterc5@nps.gov	Female	Online	388	0	5	8.9	7	3.11
646	Diane	Gutierrez	dgutierrezhx@elegantt	Female	Online	399	0	1	6.9	0	3.94