# More Exercises: Regular Expressions

Problems for exercises and homework for the ["Programming Fundamentals" course @ SoftUni](https://softuni.bg/trainings/4220/programming-fundamentals-with-java-september-2023).

You can check your solutions in [Judge](https://judge.softuni.org/Contests/1758/Regular-Expressions-More-Exercise).

## Winning Ticket

The lottery is exciting. What is not is checking a million tickets for winnings only by hand. So, you are given the task of creating a program that automatically checks if a ticket is a winner.

You are given a **collection of tickets separated by commas and spaces**. You need to check every one of them if it has a winning combination of symbols.

**A valid ticket should have exactly 20 characters**. The winning symbols are '**@**', '**#**', '**$**' and '**^**'. But for a ticket to be a winner, the symbol should uninterruptedly repeat at least **6 times** in both the **ticket left half** and the **ticket right half**.

For example, a valid winning ticket should be something like this:

"**Cash$$$$$$Ca$$$$$$sh**"

The left half "**Cash$$$$$$**" contains "**$$$$$$**", which is also contained in the ticket right half "**Ca$$$$$$sh**". A winning ticket should contain symbols repeating up to 10 times in both halves, which is considered a Jackpot (for example: "**$$$$$$$$$$$$$$$$$$$$**").

**Input**

The input will be read from the console. The input consists of a **single line** containing all tickets **separated by commas and one or more white spaces** in the format:

* **"{ticket}, {ticket}, … {ticket}"**

**Output**

Print the result for every ticket in the order of their appearance, each on a separate line in the format:

* **"invalid ticket" -** Invalid ticket
* **"ticket "{ticket}" - no match" -** no match
* **"ticket "{ticket}" - {match length}{match symbol}" -** Match with length 6 to 9
* **"ticket "{ticket}" - {match length}{match symbol} Jackpot!" -** Match with length 10

**Constraints**

* The number of tickets will be in the range **[0 … 100].**

**Examples**

|  |  |
| --- | --- |
| **Input** | **Output** |
| Cash$$$$$$Ca$$$$$$sh | ticket "Cash$$$$$$Ca$$$$$$sh" - 6$ |
| $$$$$$$$$$$$$$$$$$$$, aabb , th@@@@@@eemo@@@@@@ey | ticket "$$$$$$$$$$$$$$$$$$$$" - 10$ Jackpot!  invalid ticket  ticket "th@@@@@@eemo@@@@@@ey" - 6@ |
| validticketnomatch:( | ticket "validticketnomatch:(" - no match |

## Rage Quit

Every gamer knows what rage-quitting means. It’s basically when you’re just not good enough and you blame everybody else for losing a game. You press the CAPS LOCK key on the keyboard and flood the chat with gibberish to show your frustration.

John is a gamer and a bad one at that. He wants to be the most annoying kid on his team, so when he rage-quits, he wants something truly spectacular. He asks for your help. He’ll give you **a series of strings followed by non-negative numbers**, e.g., "a3"; you need to print on the console **each string repeated N times**; **convert the letters to uppercase beforehand**. In the example, you need to write back "AAA".

On the output, print first a statistic of the **number of unique symbols** used (the casing of letters is irrelevant, meaning that '**a**' and '**A**' are the same); the format should be **"Unique symbols used {0}"**. Then, **print the rage message** itself.

The **strings and numbers will not be separated by anything**. The input will always start with a string, and for each string, there will be a corresponding number. The entire input will be given on a **single line**; John is too lazy to make your job easier.

### Input

* The input data should be read from the console.
* It consists of a single line holding a series of **string-number sequences**.
* The input data will always be valid and in the format described. There is no need to check it explicitly.

### Output

* The output should be printed on the console. It should consist of **exactly two lines**.
* On the first line, print the **number of unique symbols used** in the message.
* On the second line, print the **resulting rage message** itself.

### Constraints

* The count of **string-number pairs** will be in the range **[1 … 20 000]**.
* Each string will contain any character **except digits**. The **length** of each string will be in the range **[1 … 20]**.
* The **repeat count** for each string will be an integer in the range **[0 … 20]**.
* Allowed working time for your program: 0.3 seconds. Allowed memory: **64MB**.

### Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| a3 | Unique symbols used: 1  AAA | We have just one string-number pair. The symbol is 'a', convert it to uppercase and repeat 3 times: AAA.  Only one symbol is used ('A'). |
| aSd2&5s@1 | Unique symbols used: 5  ASDASD&&&&&S@ | "aSd" is converted to "ASD" and repeated twice; "&" is repeated 5 times; "s@" is converted to "S@" and repeated once.   1. symbols are used: 'A', 'S', 'D', '&' and '@'. |

## Post Office

**You read a single line of ASCII symbols**, and the message is somewhere inside it. You must find it.

The input consists of three parts separated with "**|**" like this:

"**{firstPart}|{secondPart}|{thirdPart}**"

Each word **starts with a capital letter** and **has a fixed length**; you can find those in each different input part.

The **first part** carries the capital letters for each word inside the message. You must find those capital letters **1 or more** **from A to Z**. The capital letters should be surrounded from both sides with any of the following symbols – **"#, $, %, \*, &".** And those symbols **should match on both sides.** This means that **$AOTP$ - is a valid** pattern for the capital letters. **$AKTP% - is invalid since the symbols do not match.**

The **second part** of the data contains the **starting letter ASCII code and words** **length** /**between 1 – 20 characters/**, in the following format: "**{asciiCode}:{length}**".For example,"**67:05**" – means that '67' - **ASCII code** **equal to the capital letter** "**C**"**,** represents a word starting with "C" with the following 5 characters: like "**Carrot**"**.** The **ASCII code** should be a **capital letter equal to a letter from the first part**. Word's length **should be exactly 2 digits**. Length **less than** **10 will always have a padding zero**. Y**ou don't need to check that.**

The **third part of the message** are **words separated by spaces.** Those **words have to start with the Capital letter [A…Z] equal to the ASCII code and have exactly the length for each capital letter you have found in the second part. Those words can contain any ASCII symbol without spaces.**

When you find the **valid word**, you must **print it on a new line**.

### Input / Constraints

* In the first line – the text is in the form of three different parts separated by "**|**"**. Any ASCII character can be inside the input, except** '**|**'**.**
* Input will always be valid - you don’t need to check it.
* The input will always have three different parts that will always be separated by "|".

### Output

* Print all extracted words, each on a new line.
* Allowed working **time** / **memory**: **100ms** / **16MB.**

### Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comment** |
| **sdsGGasAOTPWEEEdas$AOTP$|a65:1.2s65:03d79:01ds84:02! -80:07++ABs90:1.1|adsaArmyd Gara So La Arm Armyw21 Argo O daOfa Or Ti Sar saTheww The Parahaos** | **Argo**  **Or**  **The**  **Parahaos** | **The capital letters are "AOTP"**  **Then we look for the additional length of the words for each capital letter. For A(65) -> it's 4. For O(79) -> it's 2 For T(84) -> it's 3 For P(80) -> it's 8.**  **Then we search in the last part for the words. First, start with the letter 'A' and we find "Argo". With the letter 'O' we find "Or". With the letter 'T' we find "The" and with the letter 'P' we find "Parahaos".** |
| **Urgent"Message.TO$#POAML#|readData79:05:79:0!2reme80:03--23:11{79:05}tak{65:11ar}!77:!23--)77:05ACCSS76:05ad|Remedy Por Ostream :Istream Post sOffices Office Of Ankh-Morpork MR.LIPWIG Mister Lipwig** | **Post**  **Office**  **Ankh-Morpork**  **Mister**  **Lipwig** | **The first capital letters are "POAML"**  **Then we look for the additional length of the words for each capital letter.**  **P(80) -> it's 4.**  **O(79) -> it's 6**  **A(65) -> it's 12**  **M(77) -> it's 6**  **L(76) -> it's 6.**  **Then we search the last part for the words. First, start with the letter 'P' and we find "Post". With the letter 'O' we find "Office". With the letter 'A' we find "Ankh-Morpork". With the letter 'M' we find "Mister" and with the letter 'L' we find "Lipwig".** |

## Santa's Secret Helper

After the successful second Christmas, Santa needs to gather information about children's behavior to plan the presents for next Christmas. He has a secret helper who is sending him **encrypted** information. Your task is to **decrypt it** and create a list of the good children.

You will receive an **integer**, which represents **a key,** and afterward some **messages**, which you **must decode** by **subtracting the key** from the **value** of **each** **character**. After the decryption, to be considered a valid match, a message should:

* Have a name that **starts after** **'@'** and contains **only letters from the Latin alphabet**
* Have a behavior type - "**G**" **(good) or** "**N**" **(naughty)** and must be **surrounded by** "**!**"(exclamation mark).

The order in the message should be the **child’s name -> child’s behavior.** They can be separated from the others by **any character except: '@', '-', '!', ':' and '>'.**

You will be receiving messages until you are given the "**end**" command. Afterward, print the names of the children who will receive a present on a new line.

### Input / Constraints

* The **first line** **holds n** – the number you must subtract from the characters – **integer in the range [1…100].**
* On the next lines, you will be receiving encrypted messages.

### Output

Print the **names of the children**, each on a new line.

### Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| 3  CNdwhamigyenumje$J$  CEreelh-nmguuejn$J$  CVwdq&gnmjkvng$Q$  end | Kate  Bobbie | We receive three messages, and to decrypt them, we use the key:  The first message has a decryption key 3. So we subtract from each characters code 3, and we receive:  @Kate^jfdvbkrjgb!G!  @Bobbie\*kjdrrbgk!G!  @Stan#dkjghskd!N!  **They are all valid,** and contain a child’s name and behavior – G for good and N for naughty. |
| 3  N}eideidmk$'(mnyenmCNlpamnin$J$  ddddkkkkmvkvmCFrqqru-nvevek$J$nmgievnge  ppqmkkkmnolmnnCEhq/vkievk$Q$  yyegiivoguCYdohqwlqh/kguimhk$J$  end | Kim  Connor  Valentine | We receive four messages.  They are with key 3:  Kzbfabfajh!$%jkvbkj@Kim^jkfk!G!  aaaahhhhjshsj@Connor\*ksbsbh!G!kjdfbskdb  mmnjhhhjklijkk@Ben,shfbsh!N!  vvbdffsldr@Valentine,hdrfjeh!G! |