# Programming Fundamentals Final Exam Preparation 1

## Problem 1 - Activation Keys

**Link:** <https://judge.softuni.org/Contests/Practice/Index/2302#0>

*You are about to make some good money, but first, you need to think of a way to verify who paid for your product and who didn't. You have decided to let people use the software for a free trial period and then require an activation key to continue using the product. Before you can cash out, the last step is to design a program that creates unique activation keys for each user. So, waste no more time and start typing!*

The first line of the input will be your raw activation key. It will consist of **letters and numbers only**.

After that, until the "Generate" command is given, you will be receiving strings with instructions for different operations that need to be performed upon the raw activation key.

There are several types of instructions, split by ">>>":

* "Contains>>>{substring}":
  + If the raw activation key contains the given substring, prints: "{raw activation key} contains {substring}".
  + Otherwise, prints: "Substring not found!"
* "Flip>>>Upper/Lower>>>{startIndex}>>>{endIndex}":
  + Changes the substring **between the given indices (the end index is exclusive)** to upper or lower case and then prints the activation key.
  + All given indexes will be valid.
* **"Slice>>>{startIndex}>>>{endIndex}**":
  + **Deletes** the characters between the start and end indices (**the end index is exclusive) and** prints the activation key.
  + Both indices will be **valid**.

### Input

* The first line of the input will be a string consisting of **letters and numbers only**.
* After the first line, until the "Generate" command is given, you will be receiving **strings**.

### Output

* After the "Generate" command is received, print:
  + "Your activation key is: {activation key}"

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| (["abcdefghijklmnopqrstuvwxyz",  "Slice>>>2>>>6",  "Flip>>>Upper>>>3>>>14",  "Flip>>>Lower>>>5>>>7",  "Contains>>>def",  "Contains>>>deF",  "Generate"]) | abghijklmnopqrstuvwxyz  abgHIJKLMNOPQRstuvwxyz  abgHIjkLMNOPQRstuvwxyz  Substring not found!  Substring not found!  Your activation key is: abgHIjkLMNOPQRstuvwxyz |
| **Comments** | |
| 1. **Slice>>2>>6**   abcdefghijklmnopqrstuvwxyz becomes abghijklmnopqrstuvwxyz   1. **Flip>>>Upper>>>3>>>14**   abghijklmnopqrstuvwxyz becomes abgHIJKLMNOPQRstuvwxyz   1. **Flip>>>Lower>>>5>>>7**   abgHIJKLMNOPQRstuvwxyz becomes abgHIjkLMNOPQRstuvwxyz   1. **Contains>>>def**   abgHIjkLMNOPQRstuvwxyz does not contain def   1. **Contains>>>deF**   abgHIjkLMNOPQRstuvwxyz does not contain deF  The final activation key is abgHIjkLMNOPQRstuvwxyz | |
| **Input** | **Output** |
| (["134softsf5ftuni2020rockz42",  "Slice>>>3>>>7",  "Contains>>>-rock",  "Contains>>>-uni-",  "Contains>>>-rocks",  "Flip>>>Upper>>>2>>>8",  "Flip>>>Lower>>>5>>>11",  "Generate"]) | 134sf5ftuni2020rockz42  Substring not found!  Substring not found!  Substring not found!  134SF5FTuni2020rockz42  134SF5ftuni2020rockz42  Your activation key is: 134SF5ftuni2020rockz42 |

# Problem 2 - Emoji Detector

**Link:** <https://judge.softuni.org/Contests/Practice/Index/2302#1>

Your task is to write a program that extracts emojis from a text and find the threshold based on the input.

You have to get your **cool threshold**. It is obtained by **multiplying all** the digits found in the input. The cool threshold could be a **huge number**, so be mindful.

An emoji is valid when:

* It is surrounded by 2 characters, either "::" or "\*\*"
* It is **at least 3** characters long (**without** the surrounding symbols)
* **It starts** with a **capital letter**
* Continues with **lowercase** letters **only**

Examples of valid emojis: ::Joy::, \*\*Banana\*\*, ::Wink::

Examples of invalid emojis: ::Joy\*\*, **::fox:es:**, **\*\*Monk3ys\*\*, :Snak::Es::**

You need to count **all valid emojis** in the text and calculate their **coolness**. The coolness of the emoji is **determined** by summing all the **ASCII values of all letters** in the emoji.

Examples: ::Joy:: - 306, \*\*Banana\*\* - 577, ::Wink:: - 409

You need to print the result of the cool threshold and, after that to take all emojis out of the text, count them and print **only the cool ones** on the console.

### Input

* On the single input, you will receive a piece of string.

### Output

* On the first line of the output, print the obtained Cool threshold in the format:

**"Cool threshold: {coolThresholdSum}"**

* On the following line, **print the** **count of all emojis** found in the text in format:

"{countOfAllEmojis} emojis found in the text. The cool ones are:

{cool emoji 1}

{cool emoji 2}

…

{cool emoji N}"

### Constraints

There will always be at least one digit in the text!

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| [("In the Sofia Zoo there are 311 animals in total! ::Smiley:: This includes 3 \*\*Tigers\*\*, 1 ::Elephant:, 12 \*\*Monk3ys\*\*, a \*\*Gorilla::, 5 ::fox:es: and 21 different types of :Snak::Es::. ::Mooning:: \*\*Shy\*\*"]) | Cool threshold: 540  4 emojis found in the text. The cool ones are:  ::Smiley::  \*\*Tigers\*\*  ::Mooning:: |
| **Comments** | |
| You can see all the valid emojis in green. There are various reasons why the rest are not valid, examine them carefully. The "cool threshold" is 3\*1\*1\*3\*1\*1\*2\*3\*5\*2\*1 = 540.  ::Smiley:: -> 83 + 109 + 105 + 108 + 101 + 121 = 627 > 540 -> cool  \*\*Tigers\*\* -> 84 + 105 + 103 + 101 + 114 + 115 = 622 > 540 -> cool  ::Mooning:: -> 77 + 111 + 111 + 110 + 105 + 110 + 103 = 727 > 540 -> cool  \*\*Shy\*\* -> 83 + 104 + 121 = 308 < 540 -> not cool  In the end, we print the count of all valid emojis found and each of the cool ones on a new line. | |
| **Input** | **Output** |
| (["5, 4, 3, 2, 1, go! The 1-th consecutive banana-eating contest has begun! ::Joy:: \*\*Banana\*\* ::Wink:: \*\*Vali\*\* ::valid\_emoji::"]) | Cool threshold: 120  4 emojis found in the text. The cool ones are:  ::Joy::  \*\*Banana\*\*  ::Wink::  \*\*Vali\*\* |
| **Input** | **Output** |
| (["It is a long established fact that 1 a reader will be distracted by 9 the readable content of a page when looking at its layout. The point of using ::LoremIpsum:: is that it has a more-or-less normal 3 distribution of 8 letters, as opposed to using 'Content here, content 99 here', making it look like readable \*\*English\*\*."]) | Cool threshold: 17496  1 emojis found in the text. The cool ones are: |
| **Comments** | |
| You can see \*\*English\*\* is a valid emoji, but the sum of ASCII **is not** **bigger** than the cool threshold. That's why we **don't** print anything in the end. | |

## Problem 3 - Plant Discovery

**Link:** <https://judge.softuni.org/Contests/Practice/Index/2518#2>

*You have now returned from your world tour. On your way, you have discovered some new plants, and you want to gather some information about them and create an exhibition to see which plant is highest rated.*

On the **first line,** you will receive a number **n**. On the next **n lines**, you will be given some information about the plants that you have discovered in the format: **"{plant}<->{rarity}"**. **Store** that **information** because you will need it later. If you receive a plant **more than once**, **update** its rarity.

After that, until you receive the **command** **"Exhibition"**, you will be given some of these **commands**:

* **"Rate: {plant} - {rating}"** – **add** the given **rating** to the plant (**store all ratings**)
* **"Update: {plant} - {new\_rarity}"** – **update** the **rarity** of the plant with the **new one**
* **"Reset: {plant}"** – **remove all** the **ratings** of the given plant

**Note: If any given plant name is invalid, print "error"**

After the command **"Exhibition"**, print the information that you have about the plants in the following format:

**"Plants for the exhibition:  
- {plant\_name1}; Rarity: {rarity}; Rating: {average\_rating}**

**- {plant\_name2}; Rarity: {rarity}; Rating: {average\_rating}  
…**

**- {plant\_nameN}; Rarity: {rarity}; Rating: {average\_rating}"**

The **average rating** should be formatted to the **second decimal place.**

### Input / Constraints

* You will receive the input as **described above**
* **JavaScript**: you will receive a **list of strings**

### Output

* Print the **information** about all plants as **described above**

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| (["3",  "Arnoldii<->4",  "Woodii<->7",  "Welwitschia<->2",  "Rate: Woodii - 10",  "Rate: Welwitschia - 7",  "Rate: Arnoldii - 3",  "Rate: Woodii - 5",  "Update: Woodii - 5",  "Reset: Arnoldii",  "Exhibition"]) | Plants for the exhibition:  - Arnoldii; Rarity: 4; Rating: 0.00  - Woodii; Rarity: 5; Rating: 7.50  - Welwitschia; Rarity: 2; Rating: 7.00 |
| (["2",  "Candelabra<->10"  "Oahu<->10",  "Rate: Oahu - 7",  "Rate: Candelabra - 6",  "Exhibition"]) | Plants for the exhibition:  - Candelabra; Rarity: 10; Rating: 6.00  - Oahu; Rarity: 10; Rating: 7.00 |