# More Exercises: Lists

Problems for exercise and homework for the "C# Fundamentals" course @ SoftUni

You can check your solutions in Judge

## 1. Messaging

You will be given a **list of numbers** and a **string**. For each element of the list you must **calculate the sum of its digits** and take the **element, corresponding to that index from the text**. If the index is **greater than the length of the text**, start counting **from the beginning** (so that you always have a valid index). After **you get that element** from the text, you must **remove the character** you have taken from it (so for the next index the text will be with one characterless).

### Example

| Input | Output |
|---|---|
| `9992 562 8933`<br>`This is some message for you` | `hey` |
| `11 2 32 43 331 522 441 2241 711 1821`<br>`69da343n44ge96rous311!` | `dangerous!` |

## 2. Car Race

Write a program to calculate the **winner of a car race**. You will receive an **array of numbers**. Each element of the array represents the **time needed to pass through that step** (the index). There are going to be **two cars**. **One** of them **starts** from the **left side** and the **other one starts from the right side**. **The middle index of the array is the finish line**. The **number of elements** in the array **will always be odd**. Calculate **the total time for each racer to reach the finish**, which is the **middle of the array**, and **print the winner with his total time** (the **racer with less time**). If you have a **zero in the array**, you have to **reduce the time of the racer that reached it by 20%** (**from his current time**).

Print the result in the following format **`"The winner is {left/right} with total time: {total time}".`**

### Example

<table>
<tr><th>Input</th><th>Output</th></tr>
<tr><td><code>29 13 9 0 13 0 21 0 14 82 12</code></td><td><code>The winner is left with total time: 53.8</code></td></tr>
<tr><th colspan="2">Comment</th></tr>
<tr><td colspan="2">The time of the left racer is (29 + 13 + 9) * 0.8 (because of the zero) + 13 = 53.8<br>The time of the right racer is (82 + 12 + 14) * 0.8 + 21 = 107.4<br>The winner is the left racer, so we print it</td></tr>
<tr><th>Input</th><th>Output</th></tr>
<tr><td><code>26 46 31 43 1 23 44</code></td><td><code>The winner is right with total time: 68</code></td></tr>
</table>

## 3. Take/Skip Rope

Write a program, which reads a **string** and **skips** through it, extracting a **hidden message**. The algorithm you have to implement is as follows:

Let's take the string "`skipTest_String044170`" as an example.

Take every **digit** from the string and **store it** somewhere. After that, **remove** all the digits from the string. After this operation, you should have **two lists of items**: the **numbers list** and the **non-numbers list**:

- Numbers list: `[0, 4, 4, 1, 7, 0]`
- Non-numbers: `[s, k, i, p, T, e, s, t, _, S, t, r, i, n, g]`

After that, take every digit in the **numbers list** and split it up into a **take list** and a **skip list**, depending on whether the digit is in an **even** or an **odd** index:

- Numbers list: `[0, 4, 4, 1, 7, 0]`
- Take list: `[0, 4, 7]`
- Skip list: `[4, 1, 0]`

Afterward, **iterate** over both lists and **skip** `{skipCount}` characters from the **non-numbers list**, then **take** `{takeCount}` characters and store it in a **result string**. Note that the skipped characters are **summed up** as they go. The process would look like this on the aforementioned **non-numbers list**:

1. Take **0** characters ➔ Taken: "", skip **4** characters (total **0**) ➔ Skipped: "**skipTest_String**"➔ Result: ""
2. Take **4** characters➔ Taken: "**Test**", skip **1** character (total **4**) ➔ Skipped: "**skip**" ➔ Result: "**Test**"
3. Take **7** characters➔ Taken: "**String**", skip **0** characters (total **9**)➔ Skipped: "" ➔ Result: "**TestString**"

After that, just print the **result string** on the console.

### Input

- First line: The **encrypted** message as a **string**

### Output

- First line: The **decrypted** message as a **string**

### Constraints

- The count of digits in the input string will **always be even**.
- The encrypted message will contain any printable ASCII character.

### Examples

| Input | Output |
|---|---|
| `T2exs15ti23ng1_3cT1h3e0_Roppe` | `TestingTheRope` |
| `O{1ne1T2021wf312o13Th111xreve!!@!` | `OneTwoThree!!!` |
| `this forbidden mess of an age rating 0127504740` | `hidden message` |

## 4. *Mixed Up Lists

Write a program that **mixes up two lists** by some rules. You will receive **two lines of input**, each one being a **list of numbers**. The **mixing rules** are:

- Start from the **beginning of the first** list and the **ending of the second.**
- **Add** element **from the first** and element **from the second.**
- In the end, there will always be a list, in which there are **2 elements are remaining.**
- These elements will be the **range of the elements you need to print.**
- **Loop through the result list** and take **only the elements that fulfill the conclusion.**
- Print the elements **ordered in ascending** order and **separated by a space.**

## Example

<table>
<tr><th>Input</th><th>Output</th></tr>
<tr><td><code>1 5 23 64 2 3 34 54 12</code><br><code>43 23 12 31 54 51 92</code></td><td><code>23 23 31 34 43 51</code></td></tr>
<tr><th colspan="2">Comment</th></tr>
<tr><td colspan="2">After looping through the two of the arrays we get:<br><code>1 92 5 51 23 54 64 31 2 12 3 23 34 43</code><br>The constraints are <code>54</code> and <code>12</code> (so we take only the numbers between them): <code>51 23 31 23 34 43.</code><br>We print the result sorted.</td></tr>
<tr><th>Input</th><th>Output</th></tr>
<tr><td><code>87 30 65 23 39</code><br><code>41 85 41 72 46 78 10</code></td><td><code>46 65 72 78</code></td></tr>
</table>

# 5. *Drum Set

Gabsy is Orgolt's Final Revenge charming drummer. She has a drum set but the different drums have different origins – some she bought, some are gifts, so they are all of **different quality**. Every day she practices on each of them, so she does damage and reduces the drum`s quality. Sometimes a drum breaks, so she needs to buy a new one. Help her keep her drum set organized.

You will receive Gabsy's **savings**, the money she can spend on new drums. Next, you will receive a **sequence of integers,** which represents the **initial quality** of each drum in Gabsy's drum set.

Until you receive the command **`"Hit it again, Gabsy!"`**, you will be receiving an integer: the **hit power** Gabsy applies **on each drum** while practicing. When the power is applied, you should **decrease** the value of the drum's quality with the **current power**.

When a certain drum **reaches 0 quality**, it breaks. Then Gabsy should buy a replacement. She needs to buy the same model. Therefore, its quality will be **the same as the initial quality** of the broken drum. The price is calculated by the formula: `{`**`initialQuality`**`} * 3`. Gabsy will always replace her broken drums **until the moment she can no longer afford them**. If she doesn't have enough money for a replacement, the broken drum is **removed** from the drum set.

When you receive the command **`"Hit it again, Gabsy!"`**, the program ends and you should print the current state of the drum set. On the second line you should print the **remaining money** in Gabsy's savings account.

## Input

- On the **first line,** you will receive the **savings** – a floating-point number.
- On the **second line,** you will receive the **drum set**: a **sequence** of **integers**, **separated** by **spaces**.

- Until you receive the command **`"Hit it again, Gabsy!"`**, you will be receiving **integers** – the hit power Gabsy applies on each drum.

## Output

- On the first line, you should print **each drum** in the drum set, **separated** by **space**.
- Then you must print the **money** that is left on the **second line** in the format **`"Gabsy has {money left}lv."`**, formatted with two digits after the decimal point.

## Constraints

- The **savings – a floating-point number in the range [0.00…10000.00].**
- The **quality of each drum in the drum set** – an integer in the range **[1…1000].**
- The **hit power** will be in the **range [0…1000].**
- Allowed working **time** / **memory**: **100ms** / **16MB.**

## Examples

| Input | Output | Comment |
|---|---|---|
| `1000.00`<br>`58 65 33`<br>`11`<br>`12`<br>`18`<br>`10`<br>`Hit it again, Gabsy!` | `7 14 23`<br>`Gabsy has 901.00lv.` | DrumSet – `58 65 33`.<br>Day 1: hit power applied = `11` => `47 54 22`;<br>Day 2: hit power applied = `12` => `35 42 10`;<br>Day 3: hit power applied = `18` => `17 24 -8`;<br>The third drum breaks. But Gabsy has enough savings, so she replaces it => `17 24 33`;<br>Day 4: hit power applied = `10` => `7 14 23`;<br>We print the current state of the drum set and what's left in Gabsy's bank account. |
| `154.00`<br>`55 111 3 5 8 50`<br>`2`<br>`50`<br>`8`<br>`23`<br>`1`<br>`Hit it again, Gabsy!` | `27 2 4 7`<br>`Gabsy has 10.00lv.` | |