# Exercises: Lists and Matrices

Problems for exercises and homework for the [“Programming Fundamentals” course @ SoftUni](https://softuni.bg/courses/programming-fundamentals).

You can check your solutions here: <https://judge.softuni.bg/Contests/173/Lists-and-Matrices-Lab>

## Remove Negatives and Reverse

Read a **list of integers**, **remove all negative numbers** from it and print the list in **reversed order**.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 10 -5 7 9 -33 50 | 50 9 7 10 |
| 7 -2 -10 1 | 1 7 |
| -1 -2 -3 | empty |

## Append Lists

Write a program to **append several lists** of numbers.

* Lists are separated by ‘|’
* Values are separated by space (‘ ’, one or more)
* Order the lists from **last** to **first**, and their values from **left** to **right**

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 1 2 3 |4 5 6 | 7 8 | 7 8 4 5 6 1 2 3 |
| 7 | 4 5|1 0| 2 5 |3 | 3 2 5 1 0 4 5 7 |
| 1| 4 5 6 7 | 8 9 | 8 9 4 5 6 7 1 |

## Sum Adjacent Equal Numbers

Write a program to **sum all adjacent equal numbers** in a list of decimal numbers, starting from **left to right**.

* After two numbers are summed, the obtained result could be equal to some of its neighbors and should be summed as well

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 3 3 6 1 | 12 1 |
| 8 2 2 4 8 16 | 16 8 16 |
| 5 4 2 1 1 4 | 5 8 4 |

## Split by Word Casing

Read a **text**, split it into words and distribute them into 3 lists.

* Lower-case words; Mixed-case words; Upper-case words
* Use the following separators: , ; : . ! ( ) “ ‘ \ / [ ] space

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| Learn programming at SoftUni: Java, PHP, JS, HTML 5, CSS, Web, C#, SQL, databases, AJAX, etc. | Lower-case: programming, at, databases, etc  Mixed-case: Learn, Softuni, Java, 5, Web, C#  Upper-case: PHP, JS, HTML, CSS, SQL, AJAX |

## Sort Numbers

Read a **list of decimal numbers** and **sort** them.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 8 2 7 3 | 2 <= 3 <= 7 <= 8 |
| 2 4 -9 | -9 <= 2 <= 4 |

## Count Numbers

Read a **list of integers** in range [0…1000] and **print them in ascending order** along with their **number of occurrences**.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 8 2 2 8 2 2 3 7 | 2 -> 4  3 -> 1  7 -> 1  8 -> 2 |
| 10 8 8 10 10 | 8 -> 2  10 -> 3 |

## Square Numbers

Read a **list of integers** and **extract square numbers** from it and print them in **descending order**. A square number is an integer which is the square of any integer. For example, 1, 4, 9, 16 are square numbers.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 3 4 5 6 8 9 | 9 4 |
| 1 2 9 4 16 25 49 36 | 49 36 25 16 9 4 1 |

## Build a Matrix of Letters

Build a **matrix** of capital Latin letters of size **rows** x **cols** like at the example below.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 2  2 | A B  C D |
| 3  7 | A B C D E F G  H I J K L M N  O P Q R S T U |

## Rotate a Matrix

Write a program to read a **matrix of words** (space separated) and **rotate** it on the right as shown in the examples.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 3  4  A B C D  E F G H  I J K L | I E A  J F B  K G C  L H D |
| 3  3  Hi PHP Java  C# SQL JSON  HTML CSS JS | HTML C# Hi  CSS SQL PHP  JS JSON Java |