# Exercises: Strings and Text Processing

This document defines the **exercise assignments** for the ["Programming Fundamentals" course @ Software University](https://softuni.bg/courses/programming-fundamentals). Please submit your solutions (source code) of all below described problems in [Judge](https://judge.softuni.bg/Contests/321/Strings-and-RegEx-Exercise).

## Convert from Base-10 to Base-N

Write a program that takes a base-10 number (0 to 1050) and converts it to a base-N number, where 2 <= N <= 10.  
The input consists of 1 line containing two numbers separated by a single space. The first number is the base N to which you should convert. The second one is the base 10 number to be converted. **Do not use any built in converting functionality, try to write your own algorithm.**

### Hints

About the algorithm (from base-10 to base-2) you can read this [article](https://interactivepython.org/runestone/static/pythonds/BasicDS/ConvertingDecimalNumberstoBinaryNumbers.html).

The algorithm for converting from base-10 to base-N is similar: instead of “% 2”, use “% N”.

### Examples

|  |  |
| --- | --- |
| **Base-10** | **Base-N** |
| 7 10 | 13 |
| 3 154 | 12201 |
| 5 123 | 443 |
| 4 1000 | 33220 |
| 9 3487 | 4704 |

## Convert from Base-N to Base-10

Write a program that takes a base-N number and converts it to a base-10 number (0 to 1050), where 2 <= N <= 10.  
The input consists of 1 line containing two numbers separated by a single space. The first number is the base N to which you have to convert. The second one is the base N number to be converted. **Do not use any built in converting functionality, try to write your own algorithm.**

### Hints

See [this](http://4.bp.blogspot.com/-_ozWsmbO7-g/VMj49QivTWI/AAAAAAAACbg/b5BxEpJqAQ4/s1600/Algorithm%2Bto%2Bconvert%2BBinary%2Bto%2BDecimal%2Bin%2BJava.gif) picture for more clarity about base-2 to base-10. Again, the algorithm for N-base is similar.

### Examples

|  |  |
| --- | --- |
| **Base-N** | **Base-10** |
| 7 13 | 10 |
| 3 12201 | 154 |
| 5 443 | 123 |
| 4 33220 | 1000 |
| 9 4704 | 3487 |

## Unicode Characters

Write a program that converts a string to a sequence of Unicode character literals.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| Hi! | \u0048\u0069\u0021 |
| What?!? | \0057\0068\0061\0074\003f\0021\003f |
| SoftUni | \0053\006f\0066\0074\0055\006e\0069 |

## Character Multiplier

Create a **method** that takes two strings as arguments and returns the sum of their character codes multiplied (multiply str1.charAt (0) with str2.charAt (0) and add to the total sum). Then continue with the next two characters. If one of the strings is longer than the other, add the remaining character codes to the total sum without multiplication.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| Gosho Pesho | 53253 |
| 123 522 | 7647 |
| a aaaa | 9700 |

## Magic Exchangeable Words

Write a **method** that takes as input two strings, and returns Boolean if they are exchangeable or not. Exchangeable are words where the characters in the first string can be replaced to get the second string. Example: "**egg"** and "**add"** are exchangeable, but "aabbccbb**"** and "nnooppzz**"** are not. (First '**b'** corresponds to '**o'**, but then it also corresponds to '**z'**). The two words may not have the same length, if such is the case they are exchangeable only if the longer one doesn't have more types of characters then the shorter one ("Clint**"** and"Eastwaat" are exchangeable because '**a'** and **'t'** are already mapped as '**l'** and **'n'**, but "Clint**"** and **"**Eastwood" aren't exchangeable because '**o'** and '**d'** are not contained in "**Clint"**).

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| gosho hapka | true |
| aabbaa ddeedd | true |
| foo bar | false |
| Clint Eastwood | false |

## Sum Big Numbers

You are given two lines - each can be a really big number (0 to 1050). You must display the sum of these numbers.

Note: do not use the BigIntegeror BigDecimal classes for solving this problem.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| 23  23 | 46 | 9999  1 | 10000 |

|  |  |
| --- | --- |
| **Input** | **Output** |
| 923847238931983192462832102  934572893617836459843471846187346 | 934573817465075391826664309019448 |

## Multiply Big Number

You are given two lines – the first one can be a really big number (0 to 1050). The second one will be a single digit number (0 to 9). You must display the product of these numbers.

Note: do not use the BigIntegeror BigDecimal classes for solving this problem.

### Examples

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |  | **Input** | **Output** |
| 23  2 | 46 | 9999  9 | 89991 | 923847238931983192462832102  4 | 934573817465075391826664309019448 |