# Exercise: Functions

This document defines the exercises for the ["C++ Fundamentals" course @ Software University](https://softuni.bg/trainings/4263/cpp-fundamentals-november-2023).

Please submit your solutions (source code) of all below-described problems in [Judge](https://judge.softuni.org/Contests/2938/CPlusPlus-Functions).

## Center Point

Write a program that:

* Read **four floating-point numbers (coordinates of two points** on a [Cartesian coordinate system](https://en.wikipedia.org/wiki/Cartesian_coordinate_system))
  + From the first line – **coordinate X of the first point**
  + From the second line – **coordinate Y of the first point**
  + From the third line – **coordinate X of the second point**
  + From the forth line – **coordinate Y of the second point**
* **Create a method** that **prints** **coordinates of the given point that is closest** to the center of the coordinate system (0, 0) in the format: **(X, Y)**

**Note:** **If the points are at the same distance from the center, print only the first point coordinates.**

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 2  4  -1  2 | (-1, 2) |
| 1  2  7  6 | (1, 2) |

## Operations

Write a program that:

* Read **two integer numbers** from the first line of the console separated by single space
* Read **symbol** (one of the following: +, -, \*, /) from the second line of the console
  + The operations are as follows:
    - + is addition
    - - is subtraction
    - \* is multiplication
    - / is division
* Create **four functions (for each operation)** and call the right one depending on the command
* Print **result from the calculation**

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 8 4  / | 2 |
| 2 3  - | -1 |
| 1 2  + | 3 |

## Factorial Division

Write a program that:

* Read **two integer numbers**
* Calculate the [factorial](https://en.wikipedia.org/wiki/Factorial) of each number
* Divide the **factorial of the first number by the factorial of the second number**
* Print the **division, formatted to the second decimal point**

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| 5  2 | 60.00 |  | 6  2 | 360.00 |

## Print Name of Numbers

Write a program that:

* Read an integer **number in the range [0, 9999]**
* Prints **the name of that number in English**

**Hints:**

* Use lowercase English letters only
* Don't place "and" (957 is nine hundred fifty-seven, NOT nine hundred and fifty-seven)
* Skip 0 digits, except for the number 0 (0 -> zero; 101 -> one hundred one; 1001 -> one thousand one)
* Don't print dashes (print 75 as seventy five, NOT seventy-five)

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 0 | zero |
| 101 | one hundred one |
| 957 | nine hundred fifty seven |

## Multiply Evens Sum by Odds

Write a program that:

* Read an **integer number**
* **Multiply the sum of all its even digits** by **the sum of all its odd digits**
* Print the **result of the multiplication**

### Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| 12345 | 54 | 12345 has **2 even digits** - 2 and 4. Even digits have a **sum of 6**.  Also, it has **3 odd digits** - 1, 3, and 5. Odd digits have a **sum of 9**.  **Multiply 6 by 9** and you get **54**. |
| -12345 | 54 |  |

## Vowels Count

Write a program that:

* Read a **text (string)** from the console
* Create a function that receives a **text**
* Find the **count of the vowels** contained in the text
* Print the **count of the vowels** in the text

## Example Input / Output

|  |  |
| --- | --- |
| **Input** | **Output** |
| SoftUni | 3 |
| Cats | 1 |
| JS | 0 |

## Password Validator

Write a program that checks if a given password is **valid**.

The password validation **rules** are:

* It should contain **6 – 10 characters (inclusive)**
* It should contain **only letters and digits**
* It should contain **at least 2 digits**

If it is **not valid**, for any unfulfilled rule **print the corresponding message**:

* "**Password must be between 6 and 10 characters**"
* "**Password must consist only of letters and digits**"
* "**Password must have at least 2 digits**"

## Example Input / Output

|  |  |
| --- | --- |
| **Input** | **Output** |
| logIn | Password must be between 6 and 10 characters  Password must have at least 2 digits |
| MyPass123 | Password is valid |
| Pa$s$s | Password must consist only of letters and digits  Password must have at least 2 digits |

## Orders

Write a program that:

* Reads a **string** on the first line from the console, representing a **product** - "**coffee**", "**water**", "**coke**" or "**snacks**"
* Reads an **integer** on the second line from the console, representing the **quantity** of the product
* Create a function that calculates and prints the total price of an order
* The function should receive two parameters: **product** and **quantity**
* The prices for a single item of each product are:
* **coffee – 1.50**
* **water – 1.00**
* **coke – 1.40**
* **snacks – 2.00**
* Print the result, **formatted to the second digit**

## Example Input / Output

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |  | **Input** | **Output** |
| water  5 | 5.00 | coffee  2 | 3.00 | snacks  6 | 12.00 |

## Greater of Two Values

Write a program that:

* Reads a **type (string)** and **two values** of this type from the console
* Entered type can be one of the following values: "**int**", "**char**" or "**string**"
* Create functions **which can compare int, char or string**
* Return the **biggest of the two values**

## Example Input / Output

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |  | **Input** | **Output** |
| int  2  16 | 16 | char  a  z | z | string  aaa  bbb | bbb |