

# IFE2 – Final exam

Duration: 1h00

*Only one double-sided handwritten A4 sheet is allowed as a document.*

*All other documents or any other electronic devices are prohibited.*

*Scale given as an indication ( $\pm 1$ )*

## Exercise 1 – Structures and sorting (8 points)

In a video game, a character has an inventory of items, each item is defined by its name, its weight, its rarity level (1 = common, 2 = rare, 3 = legendary) and its resale price.

An example of an item description is:

- Two-handed axe
- Rare
- 3.5 kg
- 1500 gold coins

Write the C code for the following statements:

1. Define a structure type representing an object, choose the appropriate data types wisely.
2. Write a function that takes as parameter an array of objects of fixed size (representing the inventory) and sorts this array by decreasing weight; the choice of the sorting algorithm is free.

## Exercise 2 – Character strings and files (12 points)

A CSV file is a file containing lines of values separated by commas. In this exercise we will work on such a file *"inventory.txt"*, whose content is as follows:

```
Two-handed axe,2,3.5,1500
Basic sword,2,4.5,1000
Large shield,1,8.2,500
```

Write the C code for the following statements:

1. Write a function that, given a string containing a line from the file (e.g. `"Two-handed axe,2,3.5,1500"`), returns an integer representing the price of the item (the price being the number after the third decimal point)
2. Write the code that calculates the sum of the price of the items in the *"inventory.txt"* file. You may call the function written in the previous question.

**Hints (common function prototypes, as defined in the C language reference):**

```
int atoi( const char * theString );
FILE * fopen( const char * filename, const char * accessMode );
int fclose( FILE * stream );
int fprintf( FILE * stream, const char *format, ... );
int fscanf( FILE * stream, const char *format, ... );
char * strcpy( char * destination, const char * source );
unsigned int strlen( const char * theString );
char * fgets( char * string, int maxLength, FILE * stream );
char * gets( char * string );
```