



**NATIONAL PRACTICAL EXAMINATIONS FOR TSS
LEVEL 5,
SCHOOL YEAR 2022-2023**

**SECTOR: ICT AND MULTIMEDIA
TRADE: SOFTWARE PROGRAMMING AND EMBEDDED
SYSTEMS**

**INTEGRATED ASSESSMENT FOR DATA STRUCTURES
AND ALGORITHMS USING C AND C++**

Modules combined:

1. SFPPF301-PROGRAMMING FUNDAMENTALS USING C
2. SFPAJ401-DATA STRUCTURES AND ALGORITHMS WITH C++

1. INTEGRATED SITUATION:

Rwanda Coding Academy (RCA) is a Special School which teaches coding to young people who has completed O level to become good software engineers not only on Rwandan market but also abroad.

It wants to develop an inventory system in which there is a module of recording items which get in and out of its store.

The data entered on local device are saved in CSV file so that they can be moved to the RCA server after.

TASK

Suppose you are in the team to work on this project, using C/C++ programming language, develop the features specified in the next list of requirements:

Requirements:

1. The software should allow user to add new item recorded at the first time in RCA inventory using "**itemadd**" command. The item's record is made of **item_id**, **item_name**, **item_quantity**, **item_registration_date** and their values are given at once, separated by spaces as arguments of **itemadd** command.

1.1: Define a function **addItem()** which receives values for **item_id**, **item_name**, **item_quantity** and **item_registration_date** as argument and put them in the created CSV value.

2. The software should allow user to list items in the stock in alphabetically sorted order. using the "**itemslist**" command.

2.1: Define a function **listItems()** which displays all items from the CSV file on console as indicated below:

Item ID:1	Item Name:Mattress	Quantity :10	Reg Date :2023-01-01
Item ID:2	Item Name:BedCover	Quantity :23	Reg Date :2023-01-01
Item ID:3	Item Name:Computer	Quantity :16	Reg Date :2023-01-01
Item ID:4	Item Name:Projector	Quantity :20	Reg Date :2023-01-01
Item ID:5	Item Name:Chalks	Quantity :25	Reg Date :2023-01-01
Item ID:6	Item Name:MarkerPen	Quantity :30	Reg Date :2023-01-01
Item ID:7	Item Name:RimOfPaper	Quantity :35	Reg Date :2023-01-01

3. **"help"** command is entered, the software should display the help for defined commands and the format to use them as indicated below:

```
-----  
*      Commands syntaxes      *  
-----  
itemadd <item_id> <item_name> <quantity> <registration_date>  
itemslist
```

4. The software should continue running (without stopping) until the "exit" command is entered to stop the process.
5. The used commands and entered data should not be case sensitive.
6. If the entered command doesn't exist, the user should be notified by the software.

Time:

The allocated timing is 4hours.