



code.sprint<sup>MT</sup>



**TASKS BOOKLET**

- Final Round -  
Secondary Category

2019



DIRECTORATE FOR LEARNING &  
ASSESSMENT PROGRAMMES



# Final Round Schedule

Time Allotted	Analysis	Task	Submit	Break
09:30 – 09:40	Task 1			
09:40 – 10:50		Task 1		
10:50 – 10:55			Task 1	
20 minutes				Break
11:15 – 11:25	Task 2			
11:35 – 12:35		Task 2		
12:45 – 12:50			Task 2	
<b>END OF CHALLENGE</b>				

## Task 1 – Point-of-Sale System (70 minutes)

POS systems have replaced most traditional cash registers due to their ability to connect to the retailer's main database system. Having all data stored and accessible within one system makes daily operations more efficient and more profitable.



Write a program that simulates a POS system. This system has a Log-In Screen and a Main Menu as shown below:

Log In Screen	
Option	Description
<b>Cashier Log In</b>	A cashier must be logged-in to proceed to the Main Menu. <i>(Details of the registered cashiers is shown in Table 2)</i>
<b>Exit</b>	Terminates the program.

Main Menu	
Option	Description
<b>Enter new transaction</b>	Allows the cashier to enter the items that the client wants to buy. <i>(A list of the stock items is shown in Table 1)</i>
<b>Issue Receipt</b>	This option displays the receipt of the last transaction carried out. <i>(A sample is shown in Figure 1)</i>
<b>Display Stock List</b>	This option displays the list of items that a client can buy. <i>(A list of the stock items is shown in Table 1)</i>
<b>Cashier Sign Out</b>	Allows a logged-in cashier to sign out and return to the Log-In Screen. <i>(Details of the current registered cashiers is shown in Table 2)</i>

Stock List	
Items	Price
Printer	€67.99
Monitor	€138.00
Keyboard	€12.50
Graphics Card	€114.99
Soundbar	€249.00
Hard Disk	€66.95
Headset	€17.55
Smartwatch	€135.00
Camcorder	€329.00
Drone	€449.99

Table 1

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<< EASY-SAVE SUPERMARKET >>
102, Flower Street, Filfla
*****
Sun Jan 20 11:48:45 CET 2019
Receipt: 66432020
Cashier: mallia.amy
*****
MONITOR                Eur 138.00
HEADSET                 Eur 17.55
SOUNBAR                 Eur 249.00

SUBTOTAL:              EUR 404.55
VAT:                   Eur 72.82
TOTAL:                 Eur 477.37

*****
FISCAL RECEIPT
THANK YOU
----- CUT-HERE -----

```

Figure 1: Sample Generated Receipt

Registered Cashiers	
Username	Password
borg.steve	Borg87max
zammit.rita	RitPopSing!
agius.john	ToyotaBeSt
vella.carlos.02	Rock!n!Roll
mallia.amy	\$Gaga\$Lady\$

Table 2

Name the class containing the main method **RunApp1**

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Submit your program in a folder called **TASK1\_INDEXNUM**  
e.g. TASK1\_0025 or TASK1\_0004

## Assessment Rubric

Program Functionality	User Friendly Interface	Code Efficiency	Proper use of In-line Text (Comments)	Use of Proper Conventions (Camel Case, meaningful variable names etc.)
Name of Folder & Class/es	User Input	Suitable Prompts / Messages displayed	Options Validation (Login Screen, Main Menu & New Transaction)	Functionality Validation (Issuing of Receipt)
Ignoring Case Sensitivity (when searching for username & item)	Proper Use of Data Structure (such as Arrays)	Searching of Records (Stock & Cashiers)	Arithmetic Calculations (Subtotal, VAT & Total)	Generating Receipt Number (8-digit Number)
Display Receipt (simulating a real receipt as much as possible)	Display list of items in stock (including formatting)	Other Features (not listed in the task)	<b>Maximum Score: 34 + 2 for every extra feature</b>	
0 – Not Satisfactorily   1- Partly Satisfactorily   2- Entirely Satisfactorily				

### Program Rules:

- A cashier must be logged in to be able to record transactions and issue receipts. To log in, the cashier must enter the username and password. *A proper message is displayed when the username and/or password are not correct.*
- The username **IS NOT** case sensitive, and the password **IS** case sensitive; *follow hints below.*
- If there is a transaction already recorded, the program asks the cashier whether to record another transaction or not. The new transaction will overwrite the previous one.
- While recording a transaction:
  - a proper message should be displayed when an item is not in stock list.
  - the cashier must enter character **X** as an item to stop the transaction.
- A receipt is issued only if a transaction exists. *A proper message is displayed if there are no transactions.*
- The receipt should resemble a real receipt as much as possible, *as the sample in Figure 1:*
  - the receipt number is an 8-digit random generated number.
  - ideally the date when the receipt was issued is shown; *follow hints below.*
  - The Subtotal, VAT (at 18%) and Total are automatically calculated and shown on receipt.
- To sign out, the cashier must enter the cashier's password. *A proper message is displayed if password is not correct.*

### Hints:

1. To ignore case sensitivity of the username (String), the user's input can be changed into its uppercase equivalent. For example, if the user enters username 'borg.joe', it can be changed to 'BORG.JOE'. This can be done using the code: `userInput = userInput.toUpperCase();`
2. When comparing a String variable in a conditional statement the `.equals()` method should be used.
  - ⇒ `if (userInput == "BORG.JOE") {}` will not work because a String variable cannot be compared using `==`.
  - ⇒ The correct version is: `if (userInput.equals("BORG.JOE")) {}`
3. To display the date:
  - a. the library `java.util.Date` needs to be imported
  - b. an instance of class Date should be created: `Date myDate = new Date();`
  - c. display the date: `System.out.println(myDate.toString());`

## Task 2 – Mastermind (100 minutes)

Mastermind is a code-breaking game invented in 1970 by Mordecai Meirowitz, an Israeli postmaster and telecommunications expert.



In this version of MASTERMIND, the computer has the role of **codemaker** and the player that of **codebreaker**. The codemaker randomises a pattern of four coloured pins from six available colours. This colour pattern is hidden from the codebreaker. The colour pattern can contain colour duplicates; for instance, the pattern could be four of the same colour! The available colours are:

**BLUE – GREEN – PURPLE – RED – YELLOW – WHITE**

The codebreaker tries to guess the pattern, in both order and colour, within ten turns. With every guess the codemaker provides feedback by displaying the number of correct coloured pins guessed and the number of correct pin positions, as shown in the examples below:

<b>Code</b>
<b>User Guess</b>
<b>Feedback</b>

Example 1			
RED	BLUE	PURPLE	BLUE
RED	WHITE	BLUE	BLUE
Pins Guessed: 3			
Correct Pin Positions: 2			

Example 2			
WHITE	BLUE	YELLOW	RED
RED	RED	GREEN	YELLOW
Pins Guessed: 2			
Correct Pin Positions: 0			



