



INFORMATICS INSTITUTE OF  
TECHNOLOGY  
In collaboration with  
UNIVERSITY OF WESTMINSTER  
Programming Principles II  
4COSC010C

Coursework 2  
Online Music Store

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## Design

### Functional & Non-functional Requirements

#### Functional Requirements

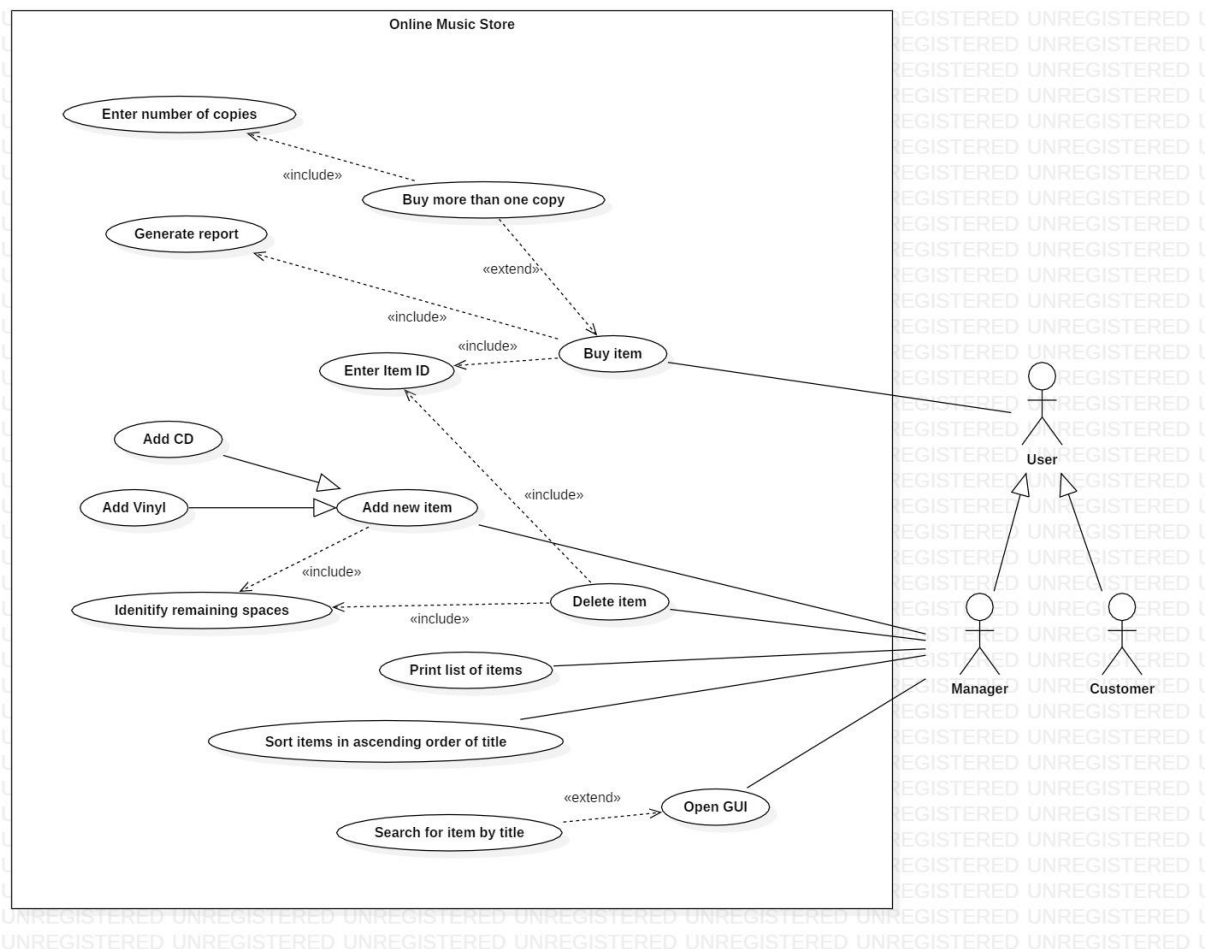
1. The system should be able to hold up to 1000 items in total.
2. The system should be able to hold information about the music items (id, title, genre, release date, artist, price, etc.).
3. The system should be able to identify the date of when the item has been released.
4. The manager should be able to insert up to 1000 items in total.
5. The manager should be able to select whether he wants to enter a CD/ a vinyl when entering records.
6. The system should be able to display the number of spaces left, whenever a manager enters an item.
7. The manager should be able to delete an item by inputting the item ID.
8. The system should be able to display the type of the item that has been deleted and the number of free spaces left, whenever a manager deletes an item.
9. The manager should be able to request to print the list of items in store.
10. The system should be able to print the list of items in store (id, type of the item, title).
11. The system should be able to sort the list of items in ascending order of title.
12. The user should be able to buy an item by selecting the item ID.
13. The user should be able to request for more than one copy of an item from the system.
14. The system should be able to display the total cost of selected items.
15. The system should be able to generate a report into a file with details of all the items that have been sold, whenever a user purchase items.
16. The user should be able to request for a GUI as an option from the menu console.
17. The system should be able to display the list of items in store with the main information, in a table.
18. The user should be able to search for a specific item by title.
19. The system should be able to display the item searched by the user.

#### Non-Functional Requirements

1. Performance – The system should be able to display all requested output within 5s.
2. Security – The user shouldn't be able to modify the records of items.
3. Accuracy –
  - a. The system should be able to accurately calculate the total cost of items selected by the user.
  - b. The system should be able to accurately chose records & options related to whatever item selected by the user/ the manager.
4. Reliability –
  - a. The system should be able to run without causing any errors.
  - b. The system should be able to store the relevant input in the relevant datatype.

5. Usability and user-friendliness –
  - a. If an incorrect parameter is entered by the user, the system should be able to handle errors.
  - b. Displaying a menu that clearly states the function of the options displayed.
  - c. Clearly displaying the output in the GUI.
6. Reusability – Ability to input purchase reports into one file.

## Use Case Diagram



## Use Case Description

### Online Music Store Management System

Use Case ID	01
Use Case Name	Add new item
Use Case Description	Adding a new item into the music store
Actors	Manager
Pre Condition	1 Display available managerial options.

	2 The manager must've selected the "add new item" option.
Post Conditions	The manager should get the option to choose between a new CS item/ a new Vinyl item.
Path	
Primary Path	1.0 The manager requests the system to add a new item 1.1 The system requests the manager to choose whether to add a CD or a Vinyl
Alternate Path	n/a (not applicable)
Exception Path	n/a (not applicable)
Assumption	n/a

Use Case ID	02
Use Case Name	Add CD
Use Case Description	Adding a new CD item into the music store
Actors	Manager
Pre Condition	The manager must've selected the "Enter CD" option.
Post Conditions	1. The system should save the added item with its information
Path	
Primary Path	2.0 The manager adds all the required information of the new CD 2.1 The system saves the information relevant to the CD. 2.2 The main menu is re-prompted.
Alternate Path	n/a (not applicable)
Exception Path	n/a (not applicable)
Assumption	n/a

Use Case ID	03
Use Case Name	Add Vinyl
Use Case Description	Adding a new Vinyl item into the music store
Actors	Manager
Pre Condition	The manager must've selected the "Enter CD" option.
Post Conditions	1. The system should save the added item with its information
Path	

Primary Path	3.0 The manager adds all the required information of the new Vinyl 3.1 The system saves the information relevant to the Vinyl. 3.2 The main menu is re-prompted
Alternate Path	n/a (not applicable)
Exception Path	n/a (not applicable)
Assumption	n/a

Use Case ID	04
Use Case Name	Delete Item
Use Case Description	Delete a selected item form the music store
Actors	Manager
Pre Condition	1. Items should have been added to the music store 2. Display available managerial options. 3. The manager should have selected the “delete item” option from the main menu 4. The main menu is prompted
Post Conditions	All the information related to the item chosen is deleted
Path	
Primary Path	4.0 The system prompts for an ‘item ID’ to be deleted 4.1 The manager enters an item ID 4.2 The system deletes the entry related to the CD 4.2 The system displays the number of remaining spaces 4.3 The system displays the type of the item that has been deleted 4.4 The system re-prompts the main menu
Alternate Path	4.0 & 4.1 have been completed 4.2 The system deletes the entry related to the Vinyl 4.3, 4.4 are executed
Exception Path	4.0 & 4.1 have been completed 4.2 The system displays that there is no related entry to the item ID entered.
Assumption	When an item is deleted, all information relevant to that item is deleted

Use Case ID	05
Use Case Name	Identify remaining spaces
Use Case Description	The manager should be able to identify the remaining number of free spaces in the music store
Actors	Manager

Pre Condition	The manager should have added an item to/ deleted an item from the music store.
Post Conditions	The main menu should be re-prompted
Path	
Primary Path	5.0 The system displays the remaining number of spaces
Alternate Path	5.0 The system displays a message that there are no available spaces
Exception Path	n/a (not applicable)
Assumption	The system can keep track of the count of the number of items entered.

Use Case ID	06
Use Case Name	Enter Item ID
Use Case Description	Entering the item ID of item to be chosen
Actors	Manager, Customer
Pre Condition	1. Items should have been added to the music store 2. Display available managerial options.
Post Conditions	1. The item chosen should be deleted with its information 2. Display the number of remaining spaces 3. Display the type of the item that has been deleted
Path	
Primary Path	4.0 The manager selects the “Delete item” option from the main menu 4.1 The system prompts for an ‘item ID’ to be deleted 4.2 The manager enters an item ID
Alternate Path	4.0 The manager selects the “Buy item” option from the main menu 4.1 The system prompts for an ‘item ID’ to be bought 4.2 The user (manager/ customer) enters an item ID
Exception Path	n/a (not applicable)
Assumption	n/a (not applicable)

Use Case ID	07
Use Case Name	Print list of items
Use Case Description	Printing the list of items in-store, with their information
Actors	Manager
Pre Condition	1. Items should have been added to the music store 2. Display available managerial options.

	3. The manager should have selected the “print list of items” option from the main menu 4. The main menu is prompted
Post Conditions	The information is clearly read and understood by the manager
Path	
Primary Path	7.0 The system displays the item ID, type of item and the title of all the items in store
Alternate Path	n/a (not applicable)
Exception Path	n/a (not applicable)
Assumption	The manager can read the information displayed

Use Case ID	08
Use Case Name	Sort items in ascending order
Use Case Description	Sorting the items in ascending order of title
Actors	Manager
Pre Condition	Items should have been entered and stored.
Post Conditions	Sorted items should be retrievable
Path	
Primary Path	8.0 The user requests to sort items 8.1 The system sorts items in ascending order.
Alternate Path	n/a (not applicable)
Exception Path	n/a (not applicable)
Assumption	Items are always sorted in ascending order

Use Case ID	09
Use Case Name	Open GUI
Use Case Description	Opening the Graphical User Interface, to see all the information for each item
Actors	Manager
Pre Condition	Items have been entered and stored.
Post Conditions	The information is clearly read and understood by the manager
Path	
Primary Path	9.0 The manager requests to open the GUI. 9.1 The GUI is opened by the system 9.2 The system shows the list of items in store with the main information.



Alternate Path	n/a (not applicable)
Exception Path	n/a (not applicable)
Assumption	All the information added to the system can be accessed by the GUI

Use Case ID	10
Use Case Name	Search for item by title
Use Case Description	Information regarding items can be searched by title
Actors	Manager
Pre Condition	1. Items have been entered and stored. 2. The GUI must be open.
Post Conditions	1. The information is clearly read and understood by the manager 2. The information relevant to the item searched remains in the system.
Path	
Primary Path	10.0 The system gives the option to search for an item's information by prompting for the item title. 10.1 The manager enters the item title of the item required to be found. 10.2 The system displays information relevant to the item chosen.
Alternate Path	n/a (not applicable)
Exception Path	n/a (not applicable)
Assumption	All the information added to the system can be accessed by the GUI

Use Case ID	11
Use Case Name	Buy item
Use Case Description	Selecting items to buy
Actors	Manager / Customer
Pre Condition	1. Items have been entered and stored. 2. The main menu is displayed by the system
Post Conditions	The required quantity of the chosen item is prompted by the system.
Path	

Primary Path	11.0 The system prompts the user to choose an option from the main menu 11.1 The user (manager/ customer) chooses the “Buy item” option. 11.2 The system prompts the user to enter the item ID of the required item. 11.3 The user (manager/ customer) enters the item ID of the required item.
Alternate Path	n/a (not applicable)
Exception Path	n/a (not applicable)
Assumption	There’s an adequate number of items in store

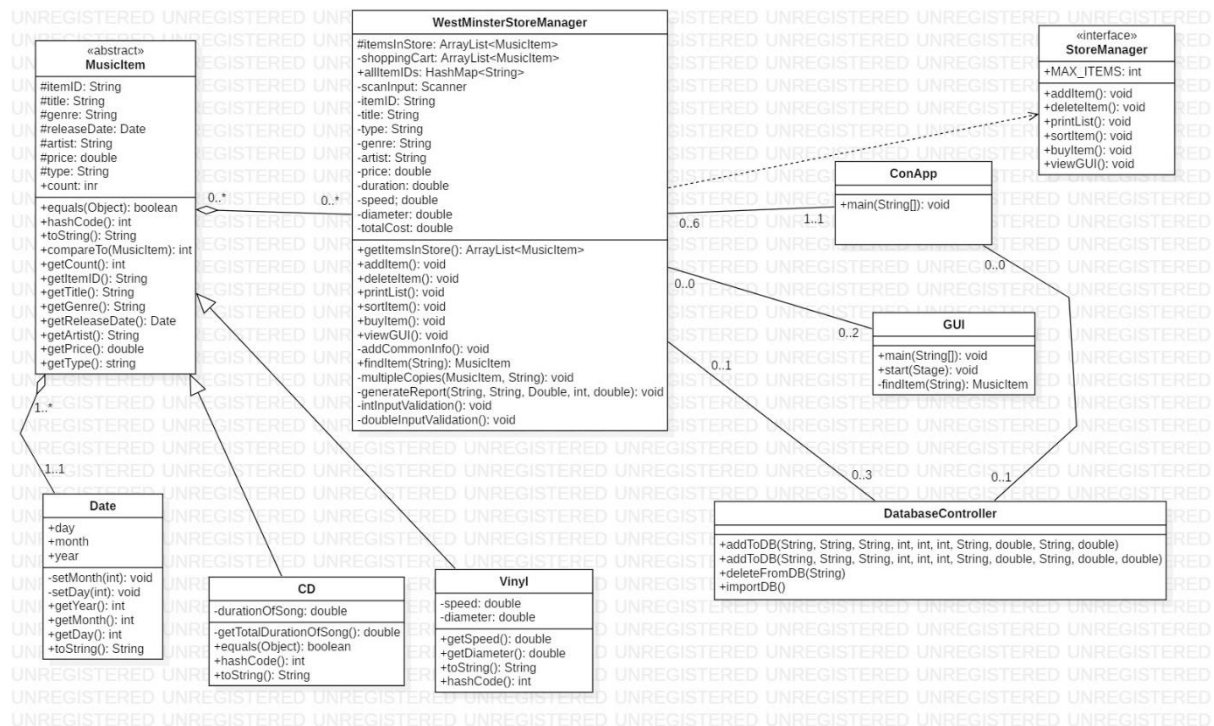
Use Case ID	12
Use Case Name	Buy more than one copy
Use Case Description	Selecting more than one copy of an item, to buy
Actors	Manager / Customer
Pre Condition	1. Items have been entered and stored. 2. The user (manager/ customer) has chosen the “Buy item” option from the main menu.
Post Conditions	The system uses the information of the purchased item, to generate a report
Path	
Primary Path	12.0 The system prompts the user whether more than one copy of the item chosen is required. 12.1 The user (manager/ customer) enters the requirement (yes/ no)
Alternate Path	n/a (not applicable)
Exception Path	n/a (not applicable)
Assumption	There’s an adequate number of items in store

Use Case ID	13
Use Case Name	Enter number of copies
Use Case Description	Entering the number of copies of the item chosen.
Actors	Manager / Customer
Pre Condition	The user (manager/ customer) has chosen the option to buy more than one copy
Post Conditions	1. The total cost of all the items chosen will be displayed.

	2. The system uses the information of the purchased item, to generate a report
Path	
Primary Path	<p>13.0 The system prompts the user to enter the number of copies required.</p> <p>13.1 The user (manager/ customer) enters the number of copies required.</p> <p>13.2 The system adds up the copies into the shopping cart.</p> <p>13.3 The system calculates the total cost of items in the shopping cart.</p>
Alternate Path	<p>13.0 has been completed.</p> <p>13.1 the user (manager/ customer) enters '1' as the number of copies required.</p> <p>13.2 The system adds one copy into the shopping cart.</p> <p>13.3 The system identifies the cost of a chosen item as the total cost.</p>
Exception Path	<p>13.0 has been completed</p> <p>13.1 The user (manager/ customer) enters '0' as the number of copies required.</p> <p>13.2 The system doesn't add any copy of the chosen item into the shopping cart</p> <p>13.3 The system assigns the total cost to be zero.</p>
Assumption	There's an adequate number of copies of the chosen item as requested, in store

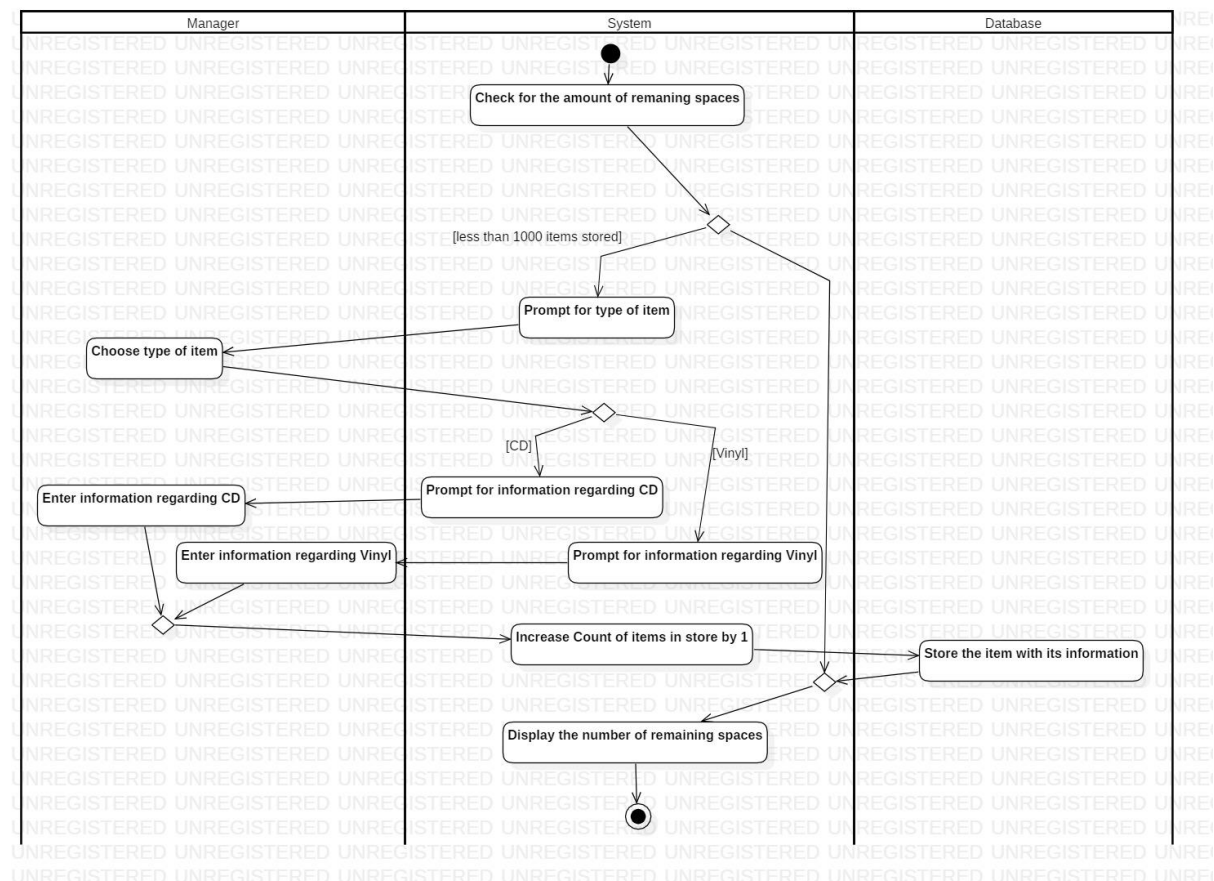
Use Case ID	14
Use Case Name	Generate report
Use Case Description	Generating a report of the items bought
Actors	Manager/ customer
Pre Condition	The user (manager/ customer) should have purchased at least one item
Post Conditions	A file is written with the information provided to generate the report.
Path	
Primary Path	<p>14.0 The user (manager/ customer) buys an item</p> <p>14.1 The system writes the title, ID, price &amp; selling time/date into a file</p>
Alternate Path	n/a (not applicable)
Exception Path	n/a (not applicable)
Assumption	All the information added to the system can be accessed by the GUI

## Class Diagram

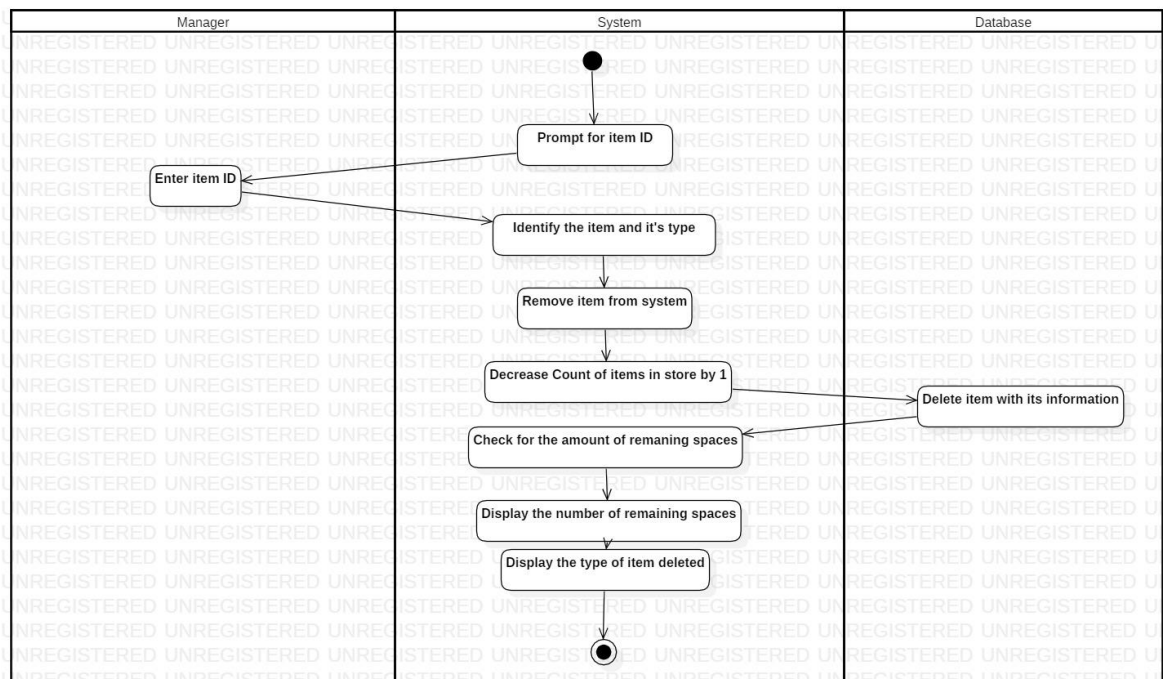


## Activity Diagrams

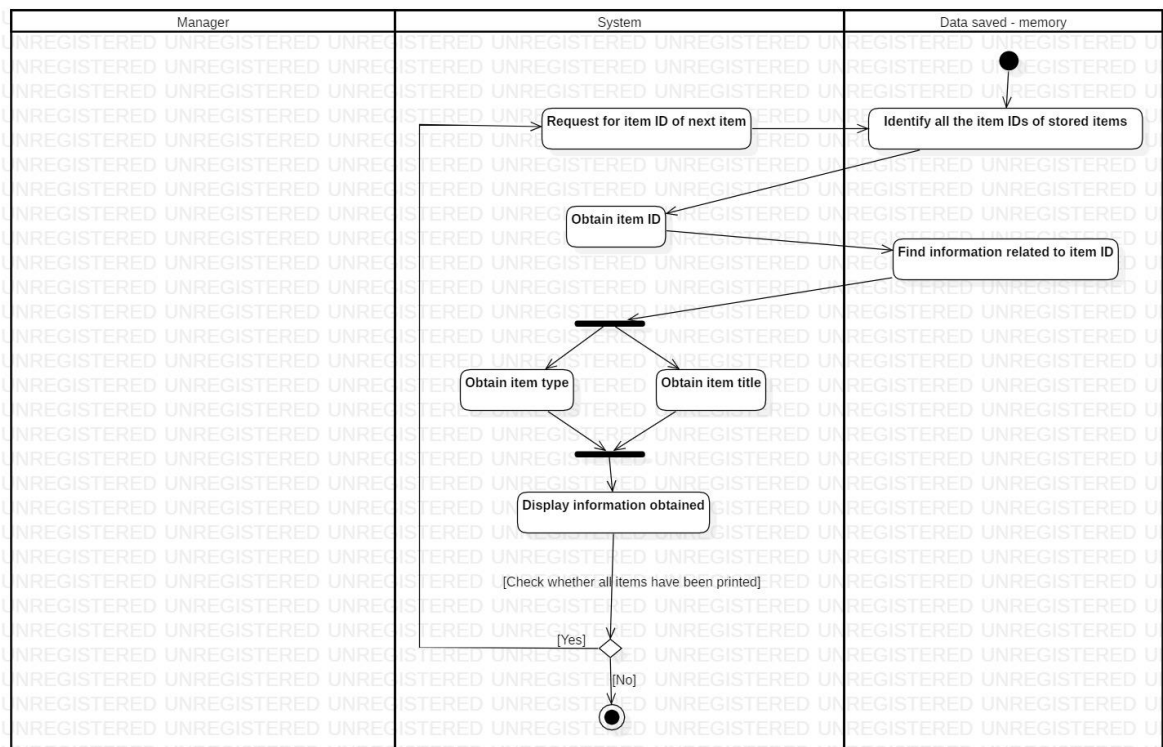
### Add item



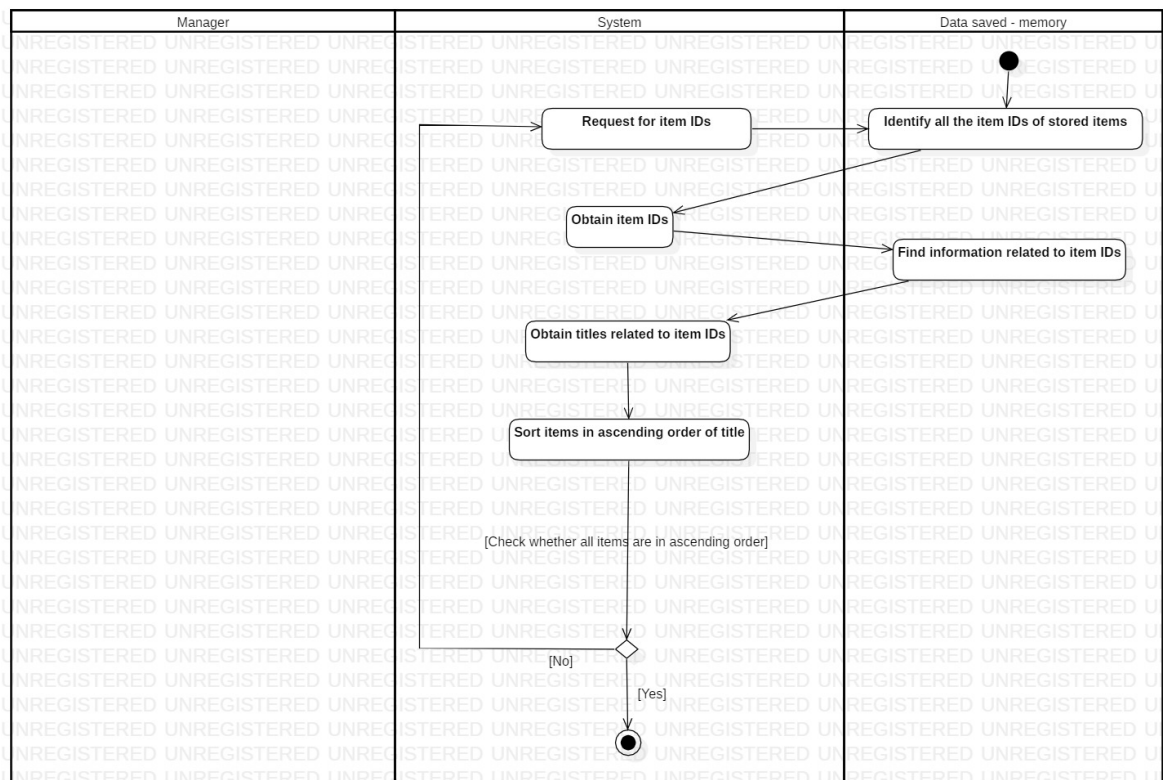
Delete item



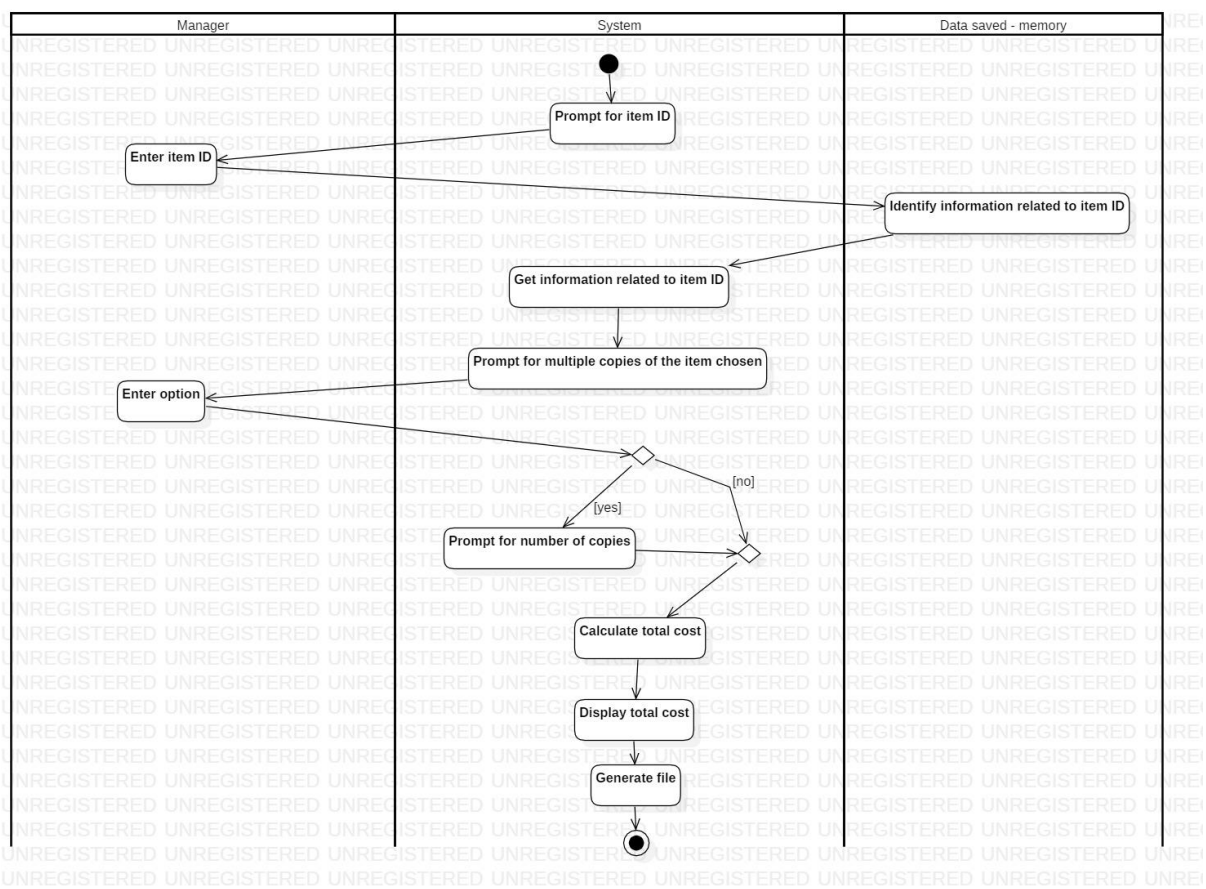
Print list of items



Sort list of items

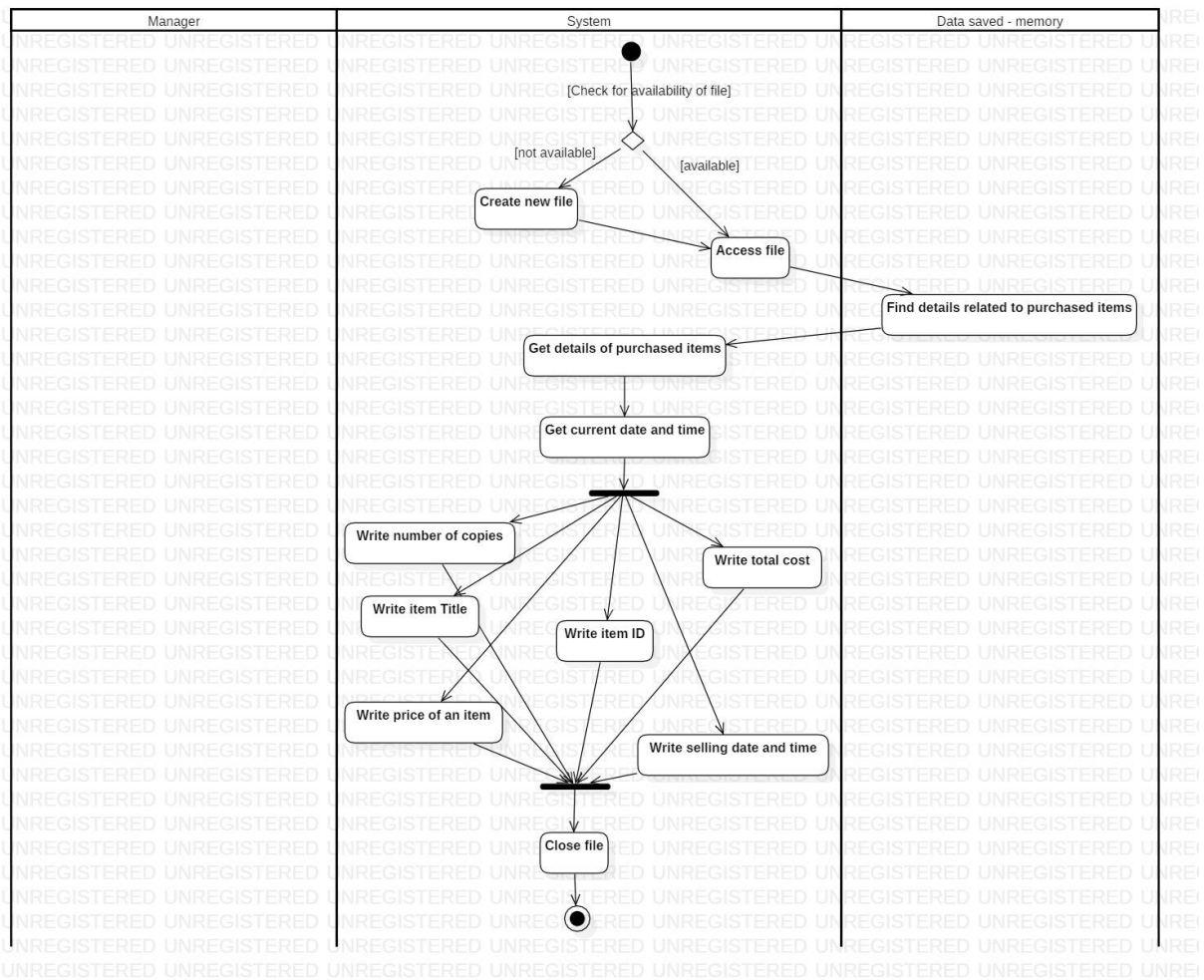


Buy items



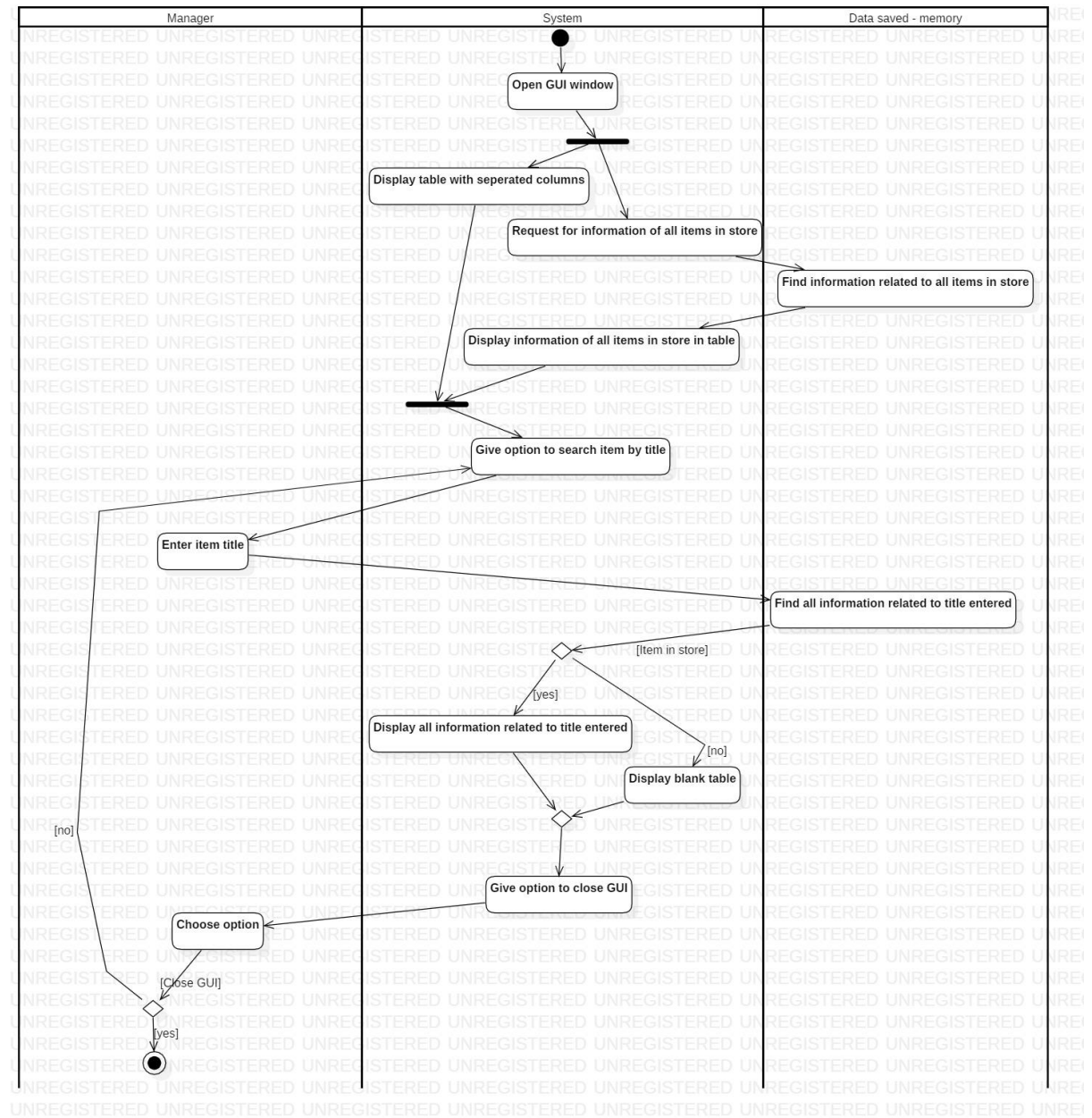


Generate File





# GUI



## Testing

### Black-box testing

Test Case ID	Test Case	Input	Expected Output	Observed Output	Status
1	Add item	1	Prompt to choose an item type	Prompt to choose an item type	Pass
		2	Prompt to enter an item ID	Prompt to enter an item ID	Pass
		8	Error message and re-prompt for input	Error message and re-prompt for input	Pass
		0			Pass
		-3			Pass
		g			Pass
2	Choose item type to add	@	Error message and re-prompt for input	Error message and re-prompt for input	Pass
		j			Pass
		9.0			Pass
3	Choose item type to add	1	User is prompted to input information about a CD	User is prompted to input information about a CD	Pass
		2	User is prompted to input information about a Vinyl	User is prompted to input information about a Vinyl	Pass
		h	Error message and re-prompt for input	Error message and re-prompt for input	Pass
		5			Pass
		-3			Pass
		#			
4	Enter Date	32/1/2019	Day is set to 1 Date entered is: 1/1/2019	Day is set to 1 Date entered is: 1/1/2019	Pass
		31/1/2019	Date entered is: 31/1/2019	Date entered is: 31/1/2019	Pass
		29/2/2019	Day is set to 1	Day is set to 1	Pass
		29/2/2020	Date entered is: 29/2/2020	Date entered is: 29/2/2020	Pass
5	Enter day OR month OR year of date	7.6	Display Error message and re-prompt for input	Display Error message and re-prompt for input	Pass
6	Buy item	7, No	Display total cost	Display total cost	Pass
7	Choose number of copies to buy	3.0	Display Error message	Display Error message	Pass
		3	Display total cost	Display total cost	Pass
8	Generate file upon purchase	Item ID = 7,	Write item ID =7, title, price, copies,	Write item ID =7, title, price, copies,	Pass

		No. of copies= 2	total cost and selling date/time in the specified file	total cost and selling date/time in the specified file	
9	Search item in GUI by title	Hello	Display all information relevant to this item in the table, if available in store	Display all information relevant to this item in the table, if available in store	Pass

*Second run*

Visual Studio Code interface showing the Coverage Summary for the 'controller' package. The browser address bar displays the file path: C:\Users\Delhi\OneDrive\Documents\IT\20Work\Semr202\Programming\20Principles\202\Programming\PP2-CW\PP2-CW2\CW\20Docs\Testing\WhiteBox\20testing... The coverage summary table shows 100% coverage for the 'controller' package and its classes: DatabaseController, GUI, and WestminsterMusicStoreManager.

Package	Class, %	Method, %	Line, %
controller	100% (5/ 5)	96.6% (28/ 29)	93.1% (299/ 321)

Class	Class, %	Method, %	Line, %
DatabaseController	100% (1/ 1)	80% (4/ 5)	98.6% (70/ 71)
GUI	100% (3/ 3)	100% (8/ 8)	100% (63/ 63)
WestminsterMusicStoreManager	100% (1/ 1)	100% (16/ 16)	88.8% (166/ 187)

generated on 2019-08-05 03:27

Coverage Report :: model

File | C:\Users\Del\%20XP515\Documents\IT\%20Work\Sem%202\Programming\%20Principles%202\Programming\PP2-CW\PP2-CW2\CW%20Docs\Testing\WhiteBox%20testing...

Apps | GitHub | Social Media | Entertainment | CodeEdu | Tech | UOW | Usage Meter | Toastmasters Intern... | Banking | Forbes | Quora | Events | Royal Colle... | BWF Calendar | Other bookmarks

[ all classes ] [ model ]

### Coverage Summary for Package: model

Package	Class, %	Method, %	Line, %
model	100% (4/ 4)	90.3% (28/ 31)	81% (64/ 79)

**CD** ▾

	Class, %	Method, %	Line, %
Date	100% (1/ 1)	80% (4/ 5)	72.7% (8/ 11)
MusicItem	100% (1/ 1)	100% (7/ 7)	95.7% (22/ 23)
Vinyl	100% (1/ 1)	92.9% (13/ 14)	81.2% (26/ 32)
	100% (1/ 1)	80% (4/ 5)	61.5% (8/ 13)

generated on 2019-08-05 03:27

## First-run

The screenshot displays the IntelliJ IDEA IDE with a code coverage report for the 'ConApp' class. The project tree on the left shows the file structure, including 'src', 'controller', and 'model' packages. The central pane shows the coverage data for 'ConApp' and its dependencies. The bottom status bar indicates the current file is up-to-date.

Element	Class, %	Method, %	Line, %
com			
controller	100% (5/5)	96% (25/26)	84% (269/320)
java			
javafx			
javax			
jdk			
META-INF	100% (0/0)	100% (0/0)	100% (0/0)
model	100% (4/4)	90% (28/31)	74% (59/79)
netstage			
oracle			
org			
sun			
view			
ConApp	100% (1/1)	100% (1/1)	89% (34/38)

14:14 CRLF UTF-8 4 spaces Git: master

## White-box testing chart

Test ID	Test Case	Status
1	The cloud database gets connected to the program when the program starts.	Pass
2	Import items saved in the database, when the program starts	Pass
3	Display main menu	Pass
4	Prompt user to choose an option from the main menu	Pass
5	Add item option prompts the user to choose the type of the item to be added	Pass
6	If CD type was chosen to be added; item ID, title, genre, release date, artist, price and duration are prompted sequentially	Pass
7	If Vinyl type was chosen to be added; item ID, title, genre, release date, artist, price, speed and diameter are prompted sequentially	Pass
8	When an item is added to the system, its information gets saved in the cloud database as a document (noSQL – MongoDB Atlas)	Pass
9	When adding items, if an item ID that already exists in store is entered, the user is notified that the item ID has already been taken and the user is prompted for a different item ID.	Pass
10	Once the chosen task is completed, the main menu is re-prompted	Pass
11	Delete item option prompts the user to enter an item ID that the user requires to delete	Pass
12	If item ID entered is of an item in store, all the information related to the item gets deleted from the system and the cloud database (MongoDB Atlas)	Pass
13	Whenever an item is added to/ deleted from the system, the number of free spaces left in the store is displayed	Pass
14	Print list of items option displays all the items in store with their item IDs, types and titles in a table format.	Pass
15	Sort items option sorts the stored items in ascending order of title and saves all the items in this order	Pass
16	When printing the list of items/ displaying them in the GUI, items are displayed in the sorted order, after sort items option is chosen.	Pass
17	Whenever new items are added, they are added to the end of these tables	
18	Buy item option prompts the user to enter an item ID of the item that the user desires to purchase	Pass
19	If the item that the user requests exists in store, the user is prompted whether more than one copy of the item chosen is required	Pass
20	If the user chooses to buy more than one item, the number of required copies is prompted	Pass
21	Once the user enters the number of copies required, the total cost of all purchased items is calculated and displayed	Pass

22	When a purchase is completed through the buy item option, a report is generated in file.	Pass
23	The title, item ID, price, total cost, selling date/time are saved in the file generated upon completion of purchase.	Pass
24	If the item ID entered in delete item and buy item options isn't found in the system, the user is notified that there's no such item in store.	Pass
25	Open GUI option opens the Graphical User Interface in a separate window	Pass
26	All the information of the items in store are displayed in a JavaFX table component format	Pass
27	Items can be searched by Title in a search box displayed in the GUI	Pass
28	When Reset button is clicked in the GUI, all the items in store are displayed in the table and the search field is emptied	Pass
29	If the user tries to enter more than 1000 items, the system notifies the user that there're no available spaces to store new items	Pass
30	Exit program option in the main menu, ends the program	Pass