

SCHOOL OF COMPUTING
DIPLOMA IN INFORMATION TECHNOLOGY
ST0509 JAVA PROGRAMMING
20222023 SEMESTER 2
PRACTICAL ASSIGNMENT CA2

Objective of Assignment

To allow students to practice what they have learnt in the module by enhancing the Mini Student system from Assignment 1 to add in new features by using GUI, file input/output, inheritance & polymorphism.

Instructions and Guidelines:

1. The assignment should be done individually and will account for **30%** of your final grade.
2. The assignment should be submitted by **Sunday of week 17, 12 Feb, 2023, 11:59 pm.**
3. The development platform will be in Java using NetBeans IDE.
4. **The interview will be conducted during the practical lessons on week 18.** You are expected to explain the program logic and modify the program during the interview. If you are absent from the interview, **you will be awarded zero mark for the assignment.**
5. **No marks will be awarded**, if the work is copied or you have allowed others to copy your work.
6. **50%** of the marks will be deducted for assignments that are received within **ONE (1) calendar** day after the submission deadline. No marks will be given thereafter.



Warning: Plagiarism means passing off as one's own the ideas, works, writings, etc., which belong to another person. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turning it in as your own, even if you would have the permission of that person.

Plagiarism is a serious offence, and if you are found to have **committed, aided, and/or abetted** the offence of plagiarism, disciplinary action will be taken against you. If you are guilty of plagiarism, you may **fail all modules** in the semester, or even be **liable for expulsion**.

Assignment Overview

You are tasked to develop a Java program to simulate a Comic Rental System.

Enhance the Comic Rental System that you have done in Assignment 1 to add in following features.

- 1) Design GUI for the system and write the code to handle the UI events such as to navigate Rentee's info and Comic's info, search for Rentee and Comic, print earning statistic, etc.. The following screen shot is just an example, **you are strongly suggested to design good UI for the assignment** using JLabel, JTextField/JTextArea, JButton, JRadioButton/ JCheckBox.. etc

The screenshot displays the 'Comic Rental System' GUI. It is divided into several sections:

- Comic 1 of 6:** Contains fields for ISBN-13 (978-0785199618), Title (Spider-Man: Miles Morales), Daily Rental Cost (\$0.72), and Deposit (\$15.83). There is also an 'Additional Information' text area with the text 'This is a Comic in English' and 'Previous'/'Next' buttons.
- Rentee 2 of 4:** Contains fields for Member-ID (M220622) and Name (Ariq Sulaiman). Below is a 'List of Loans' table.

ISBN-13	Title	Rental Per Day	Deposit Fee
978-0785199618	Spider-Man: Miles Morales	\$0.72	\$15.83
978-0785190219	Ms. Marvel: No Normal	\$0.80	\$17.59
978-0785198956	Secret Wars	\$1.75	\$38.49

 'Previous' and 'Next' buttons are at the bottom.
- System Message:** A large empty text area for displaying messages, with 'Get Earning Stats' and 'Clear Message' buttons below it.
- Search:** Features radio buttons for 'Comic by ISBN-13' (selected) and 'Rentee by MemberID'. Below is a 'Search:' text field and a green 'Search' button.
- Bottom:** A red 'Save & Exit' button.

Figure 1.1 When the program starts, it displays the first Rentee and firstComic's information. Take note that you should display

1. Member ID, Name, List of Loans for Rentee.
2. ISBN-13, Title, Daily Rental Cost and Deposit, Additional Information as it can be
 - Comic in English
 - Manga translate to English
 - Manga in Japanese

The title should change accordingly.

Comic Rental System

Comic 1 of 6

ISBN-13: 978-0785199618

Title: Spider-Man: Miles Morales

Daily Rental Cost: \$0.72

Deposit: \$15.83

Additional Information:
This is a Comic in English

Previous Next

Rentee 2 of 4

Member-ID: M220622

Name: Ariq Sulaiman

List of Loans:

ISBN-13	Title	Rental Per Day	Deposit Fee
978-0785199618	Spider-Man: Miles Morales	\$0.72	\$15.83
978-0785190219	Ms. Marvel: No Normal	\$0.80	\$17.59
978-0785198956	Secret Wars	\$1.75	\$38.49

Previous Next

System Message

Get Earning Stats Clear Message

Search

☒ Comic by ISBN-13 ☐ Rentee by MemberID

Search:

Search

Save & Exit

Figure 1.2 The program should allow the user to navigate the comics available by clicking the **Previous**, **Next** buttons in the **Comic** panel.

Take note that if the Comic is a Manga, it need to display if its translated to English or in original language, which is Japanese.

Comic 5 of 6

ISBN-13: 978-1421539898

Title: Naruto Vol. 1

Daily Rental Cost: \$1.15

Deposit: \$25.31

Additional Information:
This is a Manga translated to English

Previous Next

Comic 6 of 6

ISBN-13: 978-4091400017

Title: Doremon

Daily Rental Cost: \$0.64

Deposit: \$14.17

Additional Information:
This is a Manga in Japanese

Previous Next

Figure 1.2B The comic will display whether it's a manga in additional information.

The screenshot displays the 'Comic Rental System' interface. The top section is divided into two main panels: 'Comic 1 of 6' on the left and 'Rentee 2 of 4' on the right.

Comic 1 of 6 Panel:

- ISBN-13: 978-0785190648
- Title: Spider-Man
- Daily Rental Cost: \$0.72
- Additional Information: This is a Comic in English
- Buttons: Previous, Next

Rentee 2 of 4 Panel:

- Member-ID: M220622
- Name: Ariq Sulaiman
- List of Loans:

ISBN-13	Title	Rental Per Day	Deposit Fee
978-0785199618	Spider-Man: Miles Morales	\$0.72	\$15.83
978-0785190219	Ms. Marvel: No Normal	\$0.80	\$17.59
978-0785198956	Secret Wars	\$1.75	\$38.49

Buttons: Previous, Next

System Message Panel:

- Buttons: Get Earning Stats, Clear Message

Search Panel:

- Search by: ☒ Comic by ISBN-13 ☐ Rentee by MemberID
- Search:
- Search button

Bottom Panel:

- Buttons: Save & Exit

Annotations:

- A callout box points to the 'Title' field with the text: 'The title should change accordingly.'
- A red box highlights the 'Previous' and 'Next' buttons in the 'Rentee Panel'.
- A red arrow points to the 'Search' button.

Figure 1.3 The program should allow the user to navigate the Rentees by clicking the **Previous**, **Next** buttons in **Rentee** Panel.

Comic Rental System

Comic 1 of 6

ISBN-13: 978-0785199618

Title: Spider-Man: Miles Morales

Daily Rental Cost: \$0.72

Deposit: \$15.83

Additional Information:
This is a Comic in English

Previous Next

Rentee 1 of 4

Member-ID: M220633

Name: Johnnv Seet

List of Loans:

ISBN-13	Title	Rental Per Day	Deposit Fee
978-0785199618	Spider-Man: Miles Morales	\$0.72	\$15.83
978-0785156598	Infinity Gauntlet	\$1.25	\$27.49

Previous Next

System Message

No Such Member ID "anyhow" in the data!

Get Earning Stats Clear Message

Search

☐ Comic by ISBN-13 ☒ Rentee by MemberID

Search: anyhow

Search

Save & Exit

Figure 1.4 If the user Searches by Rentee's Member ID and the ID cannot be found, it displays the message accordingly.

Comic Rental System

Comic 1 of 6

ISBN-13: 978-0785199618

Title: Spider-Man: Miles Morales

Daily Rental Cost: \$0.72

Deposit: \$15.83

Additional Information:
This is a Comic in English

Previous Next

Rentee 4 of 4

Member-ID: M220645

Name: Tan Ah Beng

List of Loans:

ISBN-13	Title	Rental Per Day	Deposit Fee
978-4091400017	Doremon	\$0.64	\$14.17
978-1421539898	Naruto Vol. 1	\$1.15	\$25.31
978-0785190219	Ms. Marvel: No Normal	\$0.80	\$17.59
978-0785198956	Secret Wars	\$1.75	\$38.49

Previous Next

System Message

Found and displayed rentee with the Member ID: M220645

Get Earning Stats Clear Message

Search

☐ Comic by ISBN-13 ☒ Rentee by MemberID

Search: M220645

Search

Save & Exit

Figure 1.5 If the user Searches by Rentee's Member ID and the ID can be found, it displays the message accordingly and shows the Rentee Info in Rentee panel.

The screenshot displays the 'Comic Rental System' interface. It is divided into several sections:

- Comic 5 of 6:** Contains input fields for ISBN-13 (978-1421539898), Title (Naruto Vol. 1), Daily Rental Cost (\$1.15), and Deposit (\$25.31). There is also an 'Additional Information' text area with the text 'This is a Manga translated to English' and 'Previous'/'Next' buttons.
- Rentee 1 of 4:** Contains input fields for Member-ID (M220633) and Name (Johnny Seet). Below is a 'List of Loans' table.
- System Message:** A message box stating 'Found and displayed item with the ISBN-13: 978-1421539898'. It has 'Get Earning Stats' and 'Clear Message' buttons.
- Search:** A section with radio buttons for 'Comic by ISBN-13' (selected) and 'Rentee by MemberID'. A search input field contains '978-1421539898' and a green 'Search' button.
- Buttons:** At the bottom right is a red 'Save & Exit' button.

Red arrows indicate the flow of information: one arrow points from the ISBN-13 input field in the 'Comic 5 of 6' section to the 'Comic by ISBN-13' radio button in the 'Search' section, and another arrow points from the search input field to the 'System Message' box.

ISBN-13	Title	Rental Per Day	Deposit Fee
978-0785199618	Spider-Man: Miles Morales	\$0.72	\$15.83
978-0785156598	Infinity Gauntlet	\$1.25	\$27.49

Figure 1.6 If the user Searches by Comic's ISBN-13 and found it, it displays the message accordingly and the comic info in the comic panel.

Comic Rental System

Comic 5 of 6

ISBN-13: 978-1421539898

Title: Naruto Vol. 1

Daily Rental Cost: \$1.15

Deposit: \$25.31

Additional Information:
This is a Manga translated to English

Previous Next

Rentee 1 of 4

Member-ID: M220633

Name: Johnny Seet

List of Loans:

ISBN-13	Title	Rental Per Day	Deposit Fee
978-0785199618	Spider-Man: Miles Morales	\$0.72	\$15.83
978-0785156598	Infinity Gauntlet	\$1.25	\$27.49

Previous Next

System Message

No Such ISBN-13 "anyhow" in the data!

Get Earning Stats Clear Message

Search

☒ Comic by ISBN-13 ☐ Rentee by MemberID

Search: anyhow

Search

Save & Exit

Figure 1.6B If the user Searches by Comic's ISBN-13 and not found, it displays the message accordingly.

System Message

Earning Per Day:

There are 4 Rentees in total.

Average earning per day based on numbers of rentees is \$3.03.

Total earning per day is \$12.13.

Get Earning Stats Clear Message

Figure 1.7 If the user clicks **Get Earning Statistic**, the program displays:

- i) the number of rentees in total
- ii) average earning per day based on numbers of rentees.
- iii) total earning per day.

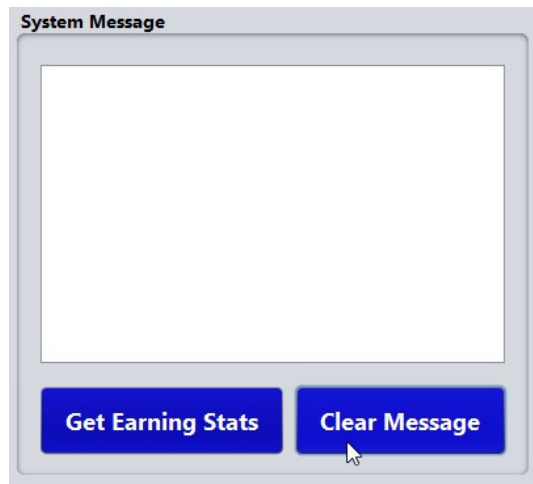


Figure 1.8 Reset System Message when the user clicks **Clear Message** button.

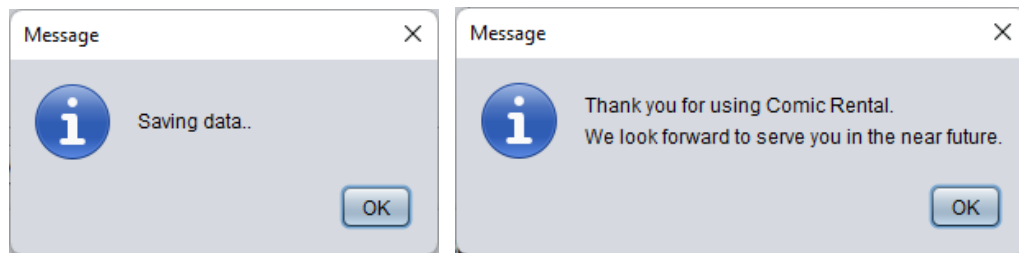


Figure 1.9. If the user clicks Exit button, it saves the **all Student objects** in a file, displays a thank you message and terminates the program.

- 2) Read the rentee information from the **rentees.txt** file to create the 4 **Rentee** objects.
(You are free to amend the text file contents below).

rentees.txt

M220633;Johnny Seet;978-0785199618#978-0785156598	
M220622;Ariq Sulaiman;978-0785199618#978-0785190219#978-0785198956	
M220644;Ganesh Parvin;978-0785190219#978-0785198956	
M220645;Tan Ah Beng;978-4091400017#978-1421539898#978-0785190219#978-0785198956	

- i) Member ID
- ii) Rentee Name
- iii) ISBN of Comics Rented, separated by #

- 3) Read the comics information from the **comics.txt** file to create the 6 comics objects.
(You are free to amend the text file contents below).

comics.txt

978-0785199618;Spider-Man: Miles Morales;112;14.39;Comic;EN	
978-0785190219;Ms. Marvel: No Normal;120;15.99;Comic;EN	
978-0785198956;Secret Wars;312;34.99;Comic;EN	
978-0785156598;Infinity Gauntlet;256;24.99;Comic;EN	
978-1421539898;Naruto Vol. 1;600;23.01;Manga;EN	
978-4091400017;Doremon;191;12.88;Manga;JP	

- i) ISBN-13
- ii) Title Name
- iii) Number of Pages
- iv) Cost Price of Stock
- v) Type: Comic or Manga
- vi) Language

- 4) Implement inheritance feature by creating subclasses of **Comic** class for Manga
- 5) Save all **Rentee** objects in a file (e.g. **rentees.dat**) before the application terminates.

Technical Requirements and Assessment Guidelines

Your assignment will be graded based on the following:

- 1) All features and UI you have implemented.
- 2) You are given two text file ***rentees.txt*** and ***comics.txt*** for the details of the rentees and comics, create a method to read in the information from the text file, process the data and create ***Rentee and Comic*** objects. You are required to implement another class file to handle all file input/output.
- 3) Implement inheritance and polymorphism feature for the system, creating at least a classes that is the subclass of ***Comic*** to meet the different type of Comic. E.g. Manga translated or not translated.
- 4) Stores **all *Rentee* objects** in a file (e.g. ***rentees.dat***) before the application terminates using Object Serialization.
- 5) Good Java class design by using appropriate methods, objects and arrays to perform the tasks.
- 6) Any program design enhancements for classes created in CA1.
- 7) Any advanced features that enhances the application.
- 8) Code efficiency and Program readability (e.g. meaningful identifiers and meaningful comments).
- 9) Independent work and the understanding of the concepts & methodology
- 10) Question & Answer during interview

Please keep in mind that advanced features are just bonus features. The main bulk of marks are allocated to the completion of a workable program that meets the assignment requirements. You should ensure that the minimum requirements are fulfilled before you attempt to include any advance features.

Assignment Submission

You are **REQUIRED** to use the **Github Classroom repository** provided to commit all your progress and changes. It will be reviewed for marking.

Submit the softcopy of your complete **Netbeans Project** in Brightspace by **Sunday of week 17, 12 Feb, 2023, 11:59pm**. Provide your Class, Admission Number and Name in comments at the beginning of **each** Java file.

-- End --