Project

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Course:	Object Oriented and Distributed Programming in Java Assessments	Date:	Wednesday, 5 March 2025, 11:19 PM
Book:	Project		

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1. Project

Faculty:	Information Technology
Module Code:	ITJVA3-12
Module Name:	Object Oriented and Distributed Programming in Java
Content Writer:	Mr. Thanyani Netshisumbewa
Internal Moderation:	Community of Practice
Copy Editor:	Kyle Keens
Total Marks:	100

Submission Week:	Week 6

This module is presented on NQF level 7.

5% will be deducted from the student's project mark for each calendar day the assignment is submitted late, up to a maximum of three calendar days. The penalty will be based on the official campus submission date.

Project submitted later than three calendar days after the deadline or not submitted will get 0%. [1]

This is an individual project

This project contributes 20 % towards the final mark.

[1] Under no circumstances will projects be accepted for marking after the roject of other students have been marked and returned to the students.

2. AI Checklist and Declaration

Before you submit an assignment, you should be able to confidently and honestly make all the below statements. For group work, you can also review the list, together, to hold one another accountable.

- I confirm that my submission reflects my personal learning, knowledge, skills, and understanding.

- If AI tools were employed for generating any part of this assignment (even in the drafting/research phase), I have referenced the use of AI in the text and/or declared the use of AI. I am willing to discuss the process and its contribution to my learning.

- I am aware that the lecturer may request a demonstration of my learning, such as explaining choices in approach, research, and the content I am submitting.

- I am aware that, if I did use AI in any phase of preparing this submitted work, it is recommended that I save a copy of the relevant chat history (prompts and answers), as this will help me demonstrate my writing/work process to my lecturer, if I am asked to do so.

- I have read the assignment instructions on whether AI tools are prohibited for this assignment, and if they are prohibited, I can confirm that I did not use AI tools.

- I understand that failure to agree to these terms may be deemed unethical, potentially leading to disciplinary action. I understand my responsibility for the integrity of my work, including seeking clarification from academic staff and adhering to instructions.

It is essential to acknowledge your use of ChatGPT or other generative AI in your learning. If you use ChatGPT or other generative AI to help you generate ideas or plan your process, you should still acknowledge how you used the tool, even if you don't include any AI-generated content in the assignment.

Please note: The following guiding questions that you will be asked in an AI declaration questionnaire below this assignment brief.

AI Declaration

It is compulsory to complete this AI declaration for each of your assignment submissions.

I carefully read the assignment instructions, and the extent to which AI may be used for the assignment.
I used the following AI system(s)/tool(s):

I used it for the following:
If I quoted or paraphrased an AI output, I have referenced the relevant tool, version, and the date I used the tool.
I still consider this work my own. (i.e., I have not outsourced the final product, or significant portions of it, to AI tools/systems).
If required, I can defend my argument/perspective, explain my choices and approach, and can show that I am knowledgeable about the details of my work.

For further guidance on the use of AI at Eduvos, please refer to the AI FAQ glossary. You will locate the FAQs in the Artificial Intelligence tile on the myDocuments page of myLMS.

3. Instructions to Students

1. Please ensure that your answer file (where applicable) is named as follows before submission: **Module Code – Assessment Type – Campus Name – Student Number.**
2. Remember to keep a copy of all submitted projects.
3. All work must be typed.
4. Please note that you will be evaluated on your writing skills in all your projects.
5. All work must be submitted through Turnitin. The full originality report will be automatically generated and available for the lecturer to assess. Negative marking will be applied if you are found guilty of plagiarism, poor writing skills, or if you have applied incorrect or insufficient referencing. (See the "instructions to students" book activity before this activity where the application of negative marking is explained.)
6. You are not allowed to offer your work for sale or to purchase the work of other students. This includes the use of professional assignment writers and websites, such as Essay Box. You are also not allowed to make use of artificial intelligence tools, such as ChatGPT, to create content and submit it as your own work. If this should happen, Eduvos reserves the right not to accept future submissions from you.

4. Section A

Section A

Learning Objective

Gain the knowledge and skills to design, code and implement object-oriented Java programs by integrating database and the use of thread programming.

Assignment Topic

 Project

Scope

First Block Weeks 1-7.

Marking Criteria

Marks will be awarded for a fully functional Java application based on specification. Ensure that your applications implement all required functionality for full marks.

4.1. Scenario

Scenario

TechBooks, an online bookstore, is experiencing rapid growth and needs to improve its backend system to manage book inventory, customer orders, and order processing efficiently. The current system is not capable of handling multiple orders simultaneously, which results in delayed processing and customer dissatisfaction.

Project Overview:

You are hired as a senior software developer to redesign the system using Java with a focus on Object-Oriented Programming (OOP), exception handling, and multithreading to enhance performance and reliability.

Source: Source: Netshisumbewa., T (2025)

End of Scenario

4.2. Deliverable 1

Deliverable 1   25 Marks

Book Inventory Management (10 Marks)

A class to represent a book with attributes: title, author, and price.

(5 Marks)

Methods to add books to the inventory and find books by title.

(5 Marks)

Customer and Order Management (15 Marks)

A class to represent a customer with attributes: name and email.

(5 Marks)

A class to represent an order containing a customer and a list of books.

(10 Marks)

End of Deliverable 1

4.3. Deliverable 2

Deliverable 2	35 Marks

Exception Handling

Custom Exceptions (15 Marks)

Implement BookNotFoundException for cases when a requested book is not found.

(7 Marks)

Implement InvalidOrderException for invalid order details.

(8 Marks)

Handling and Logging Exceptions (20 Marks)

Proper use of try-catch blocks to manage errors.

(10 Marks)

Logging exceptions for debugging and maintaining logs.

(10 Marks)

End of Deliverable 2

4.4. Deliverable 3

Deliverable 3	40 Marks

Deliverable 3:   Main Class

System Demonstration (20 Marks)

Creating books, customers, and orders.

(10 Marks)

Processing orders and displaying output.

(10 Marks)

Exception Handling (15 Marks)

Correctly handling BookNotFoundException and InvalidOrderException.

Meaningful error logs or messages.

Output and Clarity (5 Marks)

Clear and structured output format.

Output screen

Scenario 1: Successful Order Processing

```
Welcome to the Bookstore System!

Available Books:
Book [Title=Effective Java, Author=Joshua Bloch, Price=45.0]
Book [Title=Clean Code, Author=Robert C. Martin, Price=50.0]
Book [Title=Java Concurrency in Practice, Author=Brian Goetz, Price=55.0]

Processing Order for Alice
Order [Customer=Customer [Name=Alice, Email=alice@example.com],
 Books=[Book [Title=Effective Java, Author=Joshua Bloch, Price=45.0], Book [Title=Clean Co
 Total=95.0]

Processing Order for Bob
Order [Customer=Customer [Name=Bob, Emai    ↓  ob@example.com],
 Books=[Book [Title=Java Concurrency in Practice, Author=Brian Goetz, Price=55.0]],
```

Scenario 2: Handling Book Not Found Exception

```
Welcome to the Bookstore System!

Error: Book with title 'Unknown Book' not found.
```

Scenario 3: Handling Invalid Order Exception

```
Processing Order for Charlie
Error processing order: Invalid order - Order must contain at least one book.
```

End of Deliverable 3