ASSIGNMENT

CE/CZ2002: Object-Oriented Design & Programming

Building an OO Application

2013/2014 SEMESTER 1

SCHOOL OF COMPUTER ENGINEERING
NANYANG TECHNOLOGICAL UNIVERSITY

1. OBJECTIVE

The main objective of this assignment is

- to apply the Object-Oriented (OO) concepts you have learnt in the course,
- to model, design and develop a quality OO application.
- to gain familiarity with using Java as an object oriented programming language.
- to work collaboratively as a group to achieve a common goal.

2. LABORATORY

Computing Lab II (Location: N4-B2b-04).

3. EQUIPMENT

Hardware:	PC (or Laptop)
Software:	Your prefered Java IDE or simply notepad and Java Development ToolKits (JDK)

4. THE ASSIGNMENT

The assignment for your group will be to design and develop a :

MOvie Booking and LIsting Management Application (MOBLIMA)

MOBLIMA is an application to computerize the processes of making online booking and purchase of movie tickets, listing of movies and sale reporting. It will be used by the movie-goers and cinema staff.

The following are information about the application:

a) The application act as a centralized 'location' for making bookings for all the Cineplexes in different location managed by the vendor.
b) Each Cineplex will have 3 or more cinemas.
c) **The movie ticket price can be charged according to the following type** :
    a. type of movie (3D,Blockbuster,etc),
    b. class of cinema (eg Platinum Movie Suites)
    c. age of movie-goer (eg adult, senior citizen, child)
    d. day of the week or public holiday.

    An example is extracted from http://www.cathaycineplexes.com.sg/faqs.aspx is shown in Appendix A.
d) Movie listings and showtimes can be queried and booking can be made.
e) A layout of each cinema will be presented for seat selections upon booking.
    [the layout will contain aisle and main stairway. Refer to Appendix A for reference]
f) Upon booking, the application will capture the movie-goer's name, mobile number and email address. Each payment will have a transaction id (TID). The TID is of the format XXXYYYYMMDDhhmm (Y : year, M : month, D : day, h : hour, m : minutes, XXX : cinema code in letters). *[you will decide on cinema code]*
g) Movie-goer can check their booking status or past history of bookings.

h) For cinema staff only :
    a. Cinema staff need to login to access its functions
    b. Cinema staff can configure the system settings (eg, ticket prices, holidays, etc)

c. Cinema staff can enter the forthcoming movies, its type (Blockbuster/3D,etc), rating (eg PG), show times, the cinema, status (Coming Soon, Preview, Now Showing, End Of Showing), etc.
d. Cinema staff can also update the details of the movies or remove the movie by changing the status to 'End of Showing'.

e. Cinema staff can generate Sale revenue report. The revenue report can be by movie, by cineplex or by period (either day OR month) depending on the selections.
f. The revenue report will show details of movies, its sale takings, the cinemas and the period.
Eg, if selection is only by cineplex, the report will show all movies showing in the cineplex, its individual sale takings (***aggregating all type of tickets sales***) and overall sale takings (either by day or month).

Refer to Appendix A for further details and additional information can be acquired using the site, http://www.cathaycineplexes.com, as reference.

Functional Requirements (to be demonstrated):

1. Create/Update/Remove movie listing
2. Create/Update/Remove cinema showtimes and the movies to be shown
3. Search/List movie for showtimes
4. Create Booking
5. Check seat availability and selection of seat/s.
6. Print booking purchase invoice
7. Check Booking status or booking history
8. Print sale revenue report by movie, cinema and period (eg day or month)
9. Configure system settings

(Note : you may re-order or re-phrase the above functionalities when displaying your application menu)

The application is to be developed as a **Console-based application (non-Graphical UI).** Data should be stored in flat file format, either in text or binary. ***No database application (eg MySQL, MS Access, etc) is to be used.***

ADDITIONAL TASK**

- Create a Graphical UI version with ONLY the "Search/List movie for showtimes" function
- Your Graphical UI may be in Windows Form based (eg using Java Swing) OR Web based (eg using Java Server Page, JSP).
- You should demonstrate *code reuse* and *minimum change* as much as possible.
  [Aesthetic factor (ie nice UI) IS NOT a grading critieria]
- You will show your new classes and the relationship with existing classes in a Class Diagram
- You will demonstrate this in video recording and explain your design in the report.

You may populate your movies items with data collected from the internet.

You will create your own test cases and data to test your application thoroughly. However, you should also create test cases to test for cases of

- fully booked movie,
- booking on a different day of the week or holiday and type of cinema (eg suite)
- Sale revenue report by different selection, especially period.

The test cases above need to be demonstrated.

Assumptions :

(1) This is a single-user application and there is no need to consider concurrent access.
(2) THREE cineplexes will be created for demonstration.
(3) The currency will be in Singapore Dollar (SGD) and inclusive of Good and Services Tax (GST).
(4) A simple login for cinema staff is sufficed.
(5) Payment will always be successful.
(6) There is no need to interface with external system, eg Payment, printer, etc.
(7) Senior citizen can be purchased online without validation of identity or age. The validation will be done upon entering the cinema.

5. THE REPORT

Your report will include the following :

a) A detailed UML Class Diagram for the application
   - show clearly the class relationship, notation
   - notes to explain, if necessary

b) A write-up on your design considerations and use of OO concepts.
c) A detailed UML Sequence Diagram showing the flow of the **"Print sale revenue report by period (Month)"** function. The diagram should show clearly all participating objects involved with relevant interaction fragments.
d) Screen captures of the testings done (those essential test cases not covered in your demo).
e) A duly signed **Declaration of Original Work** form (Appendix B).
f) **[Optional]** Member's work contribution and distribution breakdown. Example, by class implementation/s, by diagram creation, etc.

6. DEMONSTRATION

Your group is to produce a video and **audio recording** to demonstrate the working of the application – presenting ALL the required functionalities of the application. It is advised that you planned your demonstration in a story-boarding flow to facilitate understanding of your application. ***Include a group photo and introduce your group members and lab group + group number.***

In the production, you may include :

a) Explaining essential and relevant information about the application
b) Run-through and elaborate on essential part/s of your implementation/coding

- ***The video duration must not exceed 15 minutes in total.***
- ***The font size used must be large enough to be readable and viewable.***
- ***The video quality must be clear.***
- ***The demo of the application is to done in real-time and NOT pre-run display.***

7. THE DELIVERABLE

Your group submission should be in the form of **CD or DVD** and should include the following :

a. The report.
b. Video and audio recording of the demonstration.
c. All implementation codes.

8. ASSESSMENT WEIGHTAGE

UML Class Diagram [**20 Marks**]
- Clarity, Correctness and Completeness

UML Sequence Diagram [**20 Marks**]
- Clarity, Correctness and Completeness

Design Consideration [**10 Marks**]
- Usage of OO concepts and principle (overall) - correctness and appropriateness
- Discuss how further payment gateway can be interfaced/integrated into the application.

Implementation Code [**20 Marks**]
- Diagram to Code correctness, readability, naming convention, exception handling and overall quality.

Demonstration [**20 Marks**]
- Coverage of application essentials and functionalities, user friendliness, demo flow, innovation.
- ***Based on stated video duration above.***

Additional Task [**10 Marks**]**
- Detail the design and implementation of the User Interface in consideration for usability, extensibility, etc.
- Demonstration of feature/s
- Revised Class Diagram

9. DEADLINE

This is a **group assignment**, and one CD/DVD is to be submitted from each group. Report format guidelines will be given in the course Website. The CD/DVD needs to be submitted to the **Software Projects Lab @N4-B1b-11** by **13th November 2013, 4.30pm**. *Drop your CD/DVD into the pigeon indicating **your lab class** and the **course code CE/CZ2002***. Indicate your group members and lab class on the CD/DVD.

Note that **THREE (3)** marks are to be deducted for the delay submission of each **calendar day**.

10. REFERENCES & TOOLS

- UML Diagrams tool - Visual Paradigm http://www.visual-paradigm.com/
- Edventure Cx2002 main course site content
- Edventure Cx2002 course site content on “File Input/Output”
- Object Serialization tutorial http://www.javabeginner.com/uncategorized/java-serialization
- Windows Media Encoder (a suggestion) http://www.microsoft.com/expression/products/EncoderPro_Overview.aspx

APPENDIX A:

Ticket Prices

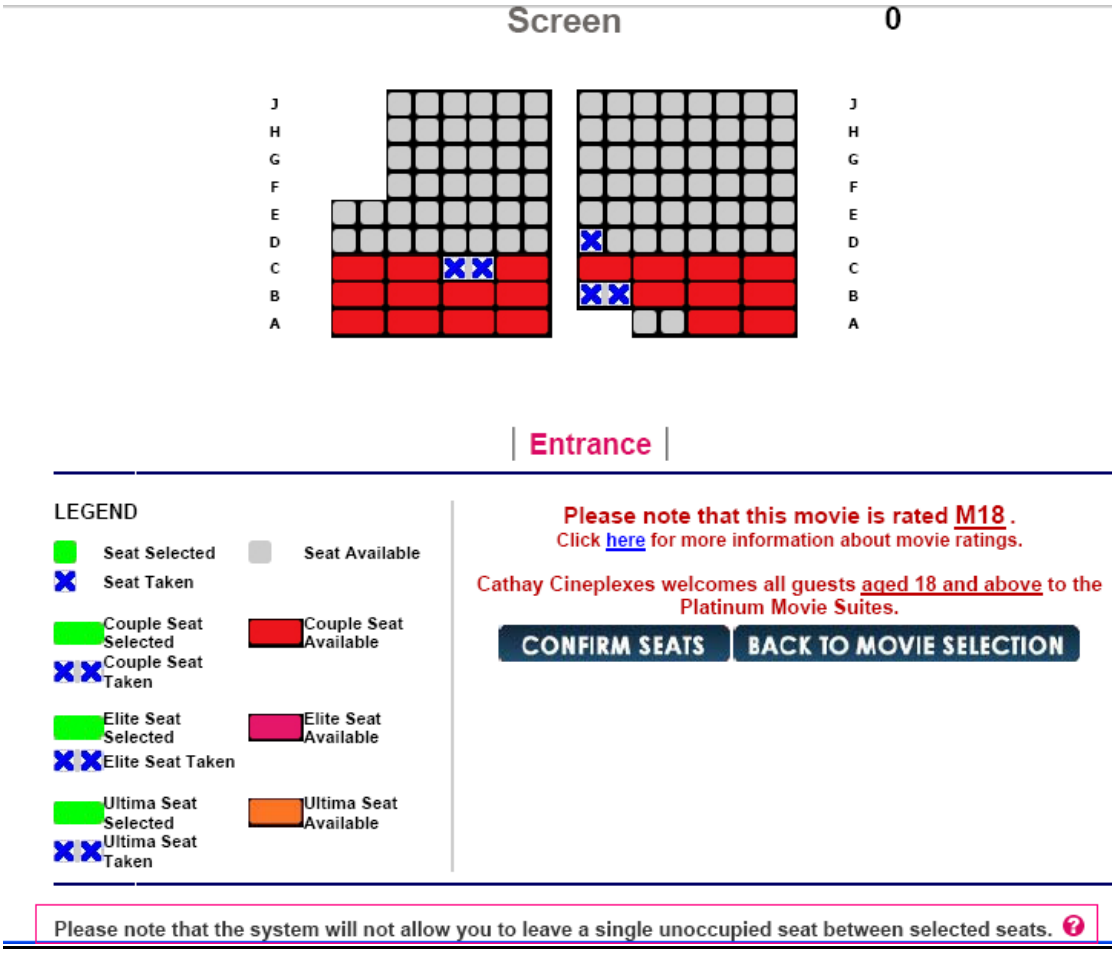
01. Current ticket prices

Non-Blockbuster Rates (2D)

TICKET TYPE	Regular & Digital Movies	3D Movies
Senior Citizens* Mon - Fri, before 6pm	$4.00 Free Tea / Coffee	N.A
Students** Mon - Fri, before 6pm	$7.00 Free 12oz Coke	$9.00
Mon - Wed# All sessions	$8.50	$11.00
Thu All sessions	$9.50	$11.00
Fri Sessions before 6pm	$9.50	$15.00
Fri Sessions from 6pm	$11.00	$15.00
Sat & Sun^ All Sessions	$11.00	$15.00
Preferred Credit & Loyalty Cards^^	$7 - $9.50	N.A

**Not valid on PH/eve of PH ^Include PH/eve of PH and weekend sneaks *For patrons 55 years & older. Not valid on PH/eve of PH
^^Refer to cathay.com.sg (under FAQs) for list of preferred cards #Sneak preview at $9.50 between Mon to Wed, excluding PH/eve of PH

Tickets for movies denoted as "Blockbuster" will be charged at $1 more than the prevailing rate.



APPENDIX B:

Declaration of Original Work for CE/CZ2002 Assignment

We hereby declare that the attached group assignment has been researched, undertaken, completed and submitted as a collective effort by the group members listed below.

We have honored the principles of academic integrity and have upheld Student Code of Academic Conduct in the completion of this work.

We understand that if plagiarism is found in the assignment, then lower marks or no marks will be awarded for the assessed work. In addition, disciplinary actions may be taken.

Name	Course (CE2002 or CZ2002)	Lab Group	Signature /Date

Important notes:

1. Name must **EXACTLY MATCH** the one printed on your Matriculation Card.

APPENDIX C:

Report requirement:

1. Format:

For the main content, please use Times New Roman 12 pt font size and 1.5 line spacing. You may choose to use other fonts (e.g, Courier New) for code segments. Please use the following report structure:

- Cover page: Declaration of original work
- Design Considerations .
  - Approach taken, Principles used, Assumptions made, etc
  - ***Optional*** : You can show the important code segment (e.g, a method or a few lines of code) and necessary illustrations to explain your solution.
- Detailed UML Class Diagram.
  - Further Notes, if needed
- Detailed UML Sequence Diagram of stated function.
  - Further Notes, if needed
- Testing.
  - Test Cases and Results

2. Length:

The report should be at most 11 pages from cover to cover including diagrams/Testing results/references/appendix, if there is any. If you could well present your work in fewer than 11 pages, you are encouraged to do so.

DO NOT include source code in the report but stored the source code in the CD/DVD.