Faculty of Design, Media and Management

Assignment Brief

Academic Year 2018/19

Module Title:	Object-Oriented Systems Development	Module Code:	CO567
Assignment No/Title:	CW1 The BUCKS Centre for the Performing Arts (Design & Implementation)	Assessment Weighting:	80%
Submission Date:	Week 12	Feedback Target Date:	+3 Weeks
Module Co-ordinator/ Tutor:	Richard Jones	Degree/Foundation Please Specify:	Degree

This assignment is to be submitted electronically using Blackboard

Submission Instruction:

1. This assignment must be submitted electronically using Blackboard by 2pm on the submission date.
2. To submit electronically you must upload your work to the e-submission area within the Blackboard module concerned. Simple instructions are provided within the module.
3. Please do not attempt to submit assignments direct to lecturers as this is not allowed and will result in a non-submission being officially recorded.
4. You will receive a digital receipt as proof of submission. This will be sent to your Bucks e-mail address; please keep this for reference.
5. You are reminded of the University's regulations on cheating and plagiarism. In submitting your assignment, you are acknowledging that you have read and understood these regulations.
6. Late submission within 10 working days of the deadline will result in the mark for the assignment being capped at 40%. Beyond this time the work will not be marked.
7. You are reminded that it is your responsibility to keep an electronic copy of your assignment for future reference.

Assignment format and other relevant instructions to students:

Section A - *Design:* (100 marks Available)

Read the BUCKS Centre for the Performing Arts case study below. As with any real-world problem statement, you will find that the information is not always presented in the most logical manner. Information on any given topic may be scattered across discussions of related topics.

Form groups of four and generate:

1) Use Case Model:

    i) A Use Case Model/Diagram from each of the following perspectives:

        a. The Consumer
        b. The Venue Manager

      c.   The Agent

   ii) Consolidate the diagrams into one

      a.   Reconcile the names, if required.
      b.   Produced full Use Case descriptions for each Use Case

2) Identifying Classes:

   i)   Create a Class Model/Diagram;
   ii) Identify Associations between the Classes;
   iii) Model Generalisations, Aggregations and Compositions if applicable;
   iv) Assign Multiplicity.

3) Data Dictionary:

   i)   Produce a table of data terms and their definitions resulting from the analysis of the case study and used in the system models.

4) Submit a brief report to accompany the above, including an explanation of the process used to produce the above models/diagrams stating any constraints and assumptions used along with any difficulties encountered and the course of action taken to overcome them. Also include an appendix recording group meetings and discussions. The members of the group should be listed as shown below:

Student Number	Course

The following table shows how the marks are allocated for different tasks:

Deliverable	Mark Available	Mark Awarded
1) Use Case Diagram	30	
2) Class Diagram	30	
3) Data Dictionary	20	
4) Report Quality (including meeting minutes)	20	
Total	100	

Section B - *Implementation:* (100 marks Available)

This section of the assignment follows on from your initial investigation into the Bucks Centre for the Performing Arts case study. You are required to use a 'sub-section' of the design module your group has developed for the design section above, as the basis for demonstrating your ability to partially implement an Objected Orientated (OO) system, comprising of at least two Classes. There should be a clear indication of how you have exploited the OO paradigm in some way, with respect to concepts such as Inheritance, Encapsulation and Polymorphism. Furthermore, a judgement needs to be made on the final 'quality' of the Detailed Designs, The Code and The Tests Cases produced.

As a group you are to generate the follow elements:

   a) Establish the set of Requirements (i.e. Expected Functional/ Non-Functional) your partial system will be based upon during the Implementation stages.

   (cont:)

(cont:)

    b) Create a suitable partial Design Class Diagram, incorporating individual behaviour and state for each identified Class, highlighting both operations and attributes.

    c) Provide a Sequence Model for at least the main function of your system (e.g. Booking a ticket, establishing a User etc.)

    d) Provide Detailed Design using Pseudo-code, for individual Class member methods and variables.

    e) Implement in a suitable Object-Oriented language (e.g. Java), identifying the Classes involved.

    f) Establish an appropriate Test Strategy highlighting how the stated Requirements for your partial system have been addressed.

5) Submit a brief Report of the process used to produce the above, covering any difficulties encountered alongside the course of action taken to overcome them. Also include an appendix recording group meetings and discussions.

The following table shows how the marks are allocated for different tasks:

Deliverable	Mark Available	Mark Awarded
Statement of Requirements	10	
Class Diagram	15	
Sequence Model	15	
Pseudo-code Detailed Designs	15	
Implemented code	20	
Testing Regime	15	
Report Quality (including meeting minutes)	10	
Total	**100**	

<u>**Note:**</u> ***The combined marks for section A and B (out of 200) will be converted to a percentage (%)***

This assignment tests the following Learning Outcomes for the module:

This assessment will be based on your ability to:
LO1. Demonstrate the fundamental concepts and principles of the object-oriented approach to the complete software lifecycle;
LO2. Analyse a problem area and design a solution in an object-oriented manner, using an object-oriented methodology;
LO3. Implement and document a solution using the object-oriented approach demonstrating the appropriate use of the methodology's main features;
LO4. Comprehend the management and workflow of using CASE development tools within the dynamics of a software development team and to be able to produce a Report with appropriately analysed conclusions.

The Assignment Task:

CASE STUDY

The Bucks Centre for the Performing Arts (BCPA), an entertainment venue, wants to allow customers to order tickets through the Internet. This new Online Ticketing System (OTS) must allow the customer to view a list of upcoming events, or view scheduled shows by date, select seat(s) from a seating chart, hold the seat(s) while they complete their selection, and purchase the selected seats.

The BCPA has contracts with several ticket agents at various ticket outlets. These contracts define the agent commissions and the terms and conditions for the sale of tickets. The contract is the agent's authorisation to

use the OTS. Associated with the contract is a sales agreement that defines the seats that are assigned to the agent to sell. One agent may not sell seats from another agent's assigned seats. The seat assignments apply to a set of seats for the specified date range, not for specific shows.

The venue manager is responsible for managing promotions for each show. A promotion defines the pricing structure for seats in a show. A pricing structure must accommodate differences for adult, student, child, and senior citizen seating. Discounts are defined per show. A promotion can be unique to each showing of an event. For example, the promotion for a Saturday matinee may be different than the promotion for the Saturday evening show. A promotion can be specific to seats within a show. A promotion may also be reused for many shows for numerous events. The system must be capable of displaying the price for each seat on the seating chart. Assigning seats to promotions must be dynamic; that is, seats may be redefined into different promotions if a show sells either better or worse than anticipated.

The system must allow the venue manager to cancel, reschedule, or add events and shows, and allow changes to the maximum-seats per-customer value for each show.

A consumer will access the OTS via the World Wide Web. The user interface will be implemented with an OO language application; that is, without browsers and hypertext mark-up language (HTML).

Consumers must provide a valid sign on and password. Then they must provide or verify their customer profile information. The customer profile includes address information for mailing the tickets. This information is also used to target customers for special promotions. The system must keep this customer information on file so that returning consumers can use their existing sign on and password and avoid re-entering the information.

Consumers are then presented with the choice between selecting a show using a list of upcoming events or a list of shows for a given date range. Once Consumers select a show, they are offered the choice of interactively selecting a seat(s) or having the system select the best available seat(s) for a price range.

When users select interactive seat selection, they are presented with a floor chart of the Concert Hall. The seating chart is coloured according to the status of the seats for each show; for example, available, held, or sold. Selecting a seat, places it on hold so that no one else can select it while the users complete their transactions.

Deselecting a seat removes the hold and makes the seat available again for other users. Users can select up to the maximum allowed seats per customer set for the show by the venue manager.

When users select automatic seat selection, they must provide a price range and the number of seats desired. The system will then attempt to select the "best" seats available. Once the attempt is completed, the system will either display the resulting seating chart with the selected seats highlighted, or an appropriate message. Users can then either accept the selection and change the criteria, or switch to interactive seat selection.

When consumers select a seat, the system will "hold" the seat so that it will appear unavailable to subsequent customers. After the consumers pay for the seats, the system will mark the seat(s) reserved and generate a ticket(s). If consumers choose not to purchase the seat(s), then the system will remove the hold, thus making the seat(s) available again.

In a transaction, consumers can purchase a single ticket or multiple tickets at varied prices. For some shows, volume discounts are available. For example, ticket purchases of £100 or more might receive a 10 % discount, or buying 6 or more tickets might qualify the consumer for a 15% discount. In all cases, each ticket must be tracked separately, with its associated price and applied discount and seat assignment.

Credit card will be the only form of currency accepted, so the system must have the ability to validate a card number and accept or reject the purchase. For this case study, assume that all credit card purchases are approved.

Ticket agents interact with the OTS using the World Wide Web. After signing onto the application as an agent, the agent interacts with the system on behalf of the customer. Once agents provide the customer profile information, the same initial choices of event selection by upcoming events or date range are displayed. Agents use the same features for seat selection as the consumer, with one additional feature; agents are able to see only the seats assigned to them. Agents can also see the total number of tickets sold for the currently displayed show or all shows for a date range.

Once the seats are placed in a hold state, an internal clock that sounds an alarm after five minutes and prompts users about continuing the transaction. The alarm then sounds every minute for three minutes, after which time all "held" seats are released if the transaction is not completed. This same feature applies to the consumer.

Assessment Criteria

Performance Level	Criteria
A grade	An excellent understanding of the subject matter as reflected in the diagrams produced. With most elements of the assignment completed fully. Excellent report demonstrating a good understanding of the problem domain.
B grade	A very good understanding of the subject matter as reflected in the diagrams produced. Most elements attempted but may not be fully developed and possible with the overall analysis indicating some minor misconceptions. Very good full report which demonstrates an understanding of the problem domain.
C grade	A good understanding of the subject matter as reflected in the diagrams produced. Most elements attempted but may not be fully developed and possible with the overall analysis indicating some minor misconceptions. A good full report which demonstrates an understanding of the problem domain.
D grade	A fair understanding of the subject matter under review as reflected in the diagrams produced. Most major elements covered but lacking some detail. An adequate report which demonstrates a reasonable understanding of the problem domain.
E grade (Work does not meet assessment requirements appropriate for this level)	A poor understanding of the subject matter under review as reflected in the diagrams produced. Most major elements are only partially covered and lacking some of the detail required at this level. A poor report which does not demonstrate a reasonable understanding of the problem domain.
F grade (work falls well below required level)	The work does not demonstrate understanding of the main principles being considered by the analysis, design and implementation and testing of software systems development appropriate to this level. The report is not complete and does not add to the understanding of the group's work. Overall the work demonstrates no real engagement with the tasks requested.

NOTES:
1. *Handwritten work is not acceptable. (Except in draft appendices work or as annotation to earlier draft work, e.g. captured in electronic form e.g. 'image' format.)*
2. *Groups will be established in week seven of the module; these groups will be final.*
3. *A contribution record must be submitted, signed by all group members.*

4. *All material sourced must be suitably referenced.*
5. *If the assessors have concerns over the functionality of the implementation, a group presentation of the code may be required – all group members will need to be present at the presentation.*

University Generic Undergraduate Degree Grade Descriptors can be found on the University website in the document 'Assessment of Students- Appendix 1'

Quality Assurance Record

Internal Approval: External Approval: