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| **Assignment Brief**  Academic Year 2021-22 | |

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| **Module code and title:** | CO567 Object-Oriented Systems Development | Module leader: | Richard Jones Nick Day |
| Assignment No. and type: | CW1 - The BUCKS Centre for the Performing Arts (Design & Implementation) | Assessment weighting: | 80% |
| Submission time and date: | 14th Jan 2022 @ 16:00 hrs. – Teaching week 13 (University Week 16)  **Hand In:- Electronic Submission** | Target feedback time and date: | w/b 31st Jan 2022 |

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| Assignment Brief |
| 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. |

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| **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 teams of four and generate:**  (3) The Agent  ii) Consolidate the diagrams into one:  (1) Reconcile the names, if required.  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 team  meetings and discussions. The members of the team should be listed as shown below:   |  |  | | --- | --- | | Student ID | Course | |  |  | |  |  | |  |  | |  |  |   **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 team 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 team 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.  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 team meetings  and discussions. |

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| This assignment has been designed to provide you with an opportunity to demonstrate your achievement of the following module learning outcomes: |
| LO 1: An understand and apply a range of algorithms and heuristics for searching |
| LO 2: An understanding of the requirements for knowledge acquisition and representation in Artificial Intelligence. |
| LO 3: The ability to develop a simple Expert Systems and to apply generic computing skills. |
| LO 4: Identify capabilities and limitations of Artificial Intelligence |

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| Referencing and research requirements |
| Please reference your work according to the Harvard style as defined in *Cite Them Right Online* (<http://www.citethemrightonline.com>). This information is also available in book form: Pears, R. and Shields, G. (2019) *Cite them right: the essential reference guide.* 11th edn. Basingstoke: Palgrave Macmillan. Copies are available via the University library. |

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| How your work will be assessed |
| Your work will be assessed on the extent to which it demonstrates your achievement of the stated learning outcomes for this assignment (see above) and against other key criteria, as defined in the University’s institutional grading descriptors. If it is appropriate to the format of your assignment and your subject area, a proportion of your marks will also depend upon your use of academic referencing conventions. ***Individual contributions will need to be proven on request.***  **Section A - Design: (100 marks Available)**  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)**  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 | 20 |  | | Implemented code | 15 |  | | Testing Regime | 10 |  | | Report Quality (including meeting minutes) | 15 |  | | **Total** | **100** |  |   **Note: The combined marks for section A and B (out of 200) will be converted to a percentage (%)**   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Section A - Design: (100 marks Available)**  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)**  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 | 20 |  | | Implemented code | 15 |  | | Testing Regime | 10 |  | | Report Quality (including meeting minutes) | 15 |  | | **Total** | **100** |  |   **Note: The combined marks for section A and B (out of 200) will be converted to a percentage (%)**  Your work will be assessed on the extent to which it demonstrates your achievement of the stated learning outcomes for this assignment (see above) and against other key criteria, as defined in the University’s institutional grading descriptors. If it is appropriate to the format of your assignment and your subject area, a proportion of your marks will also depend upon your use of academic referencing conventions. Individual contributions will need to be proven on request.  This assignment will be marked according to the grading descriptors for Level 5.   |  |  | | --- | --- | | **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. As reflected by the level of study. | | 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. As reflected by the level of study | | 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. As reflected by the level of study. | | 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. As reflected by the level of study. | | 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. As reflected by the level of study. | | 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. As reflected by the level of study. |   **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. Teams will be established in week seven of the module; these teams will be final.  3. A contribution record must be submitted, signed by all team members.  4. All material sourced must be suitably referenced.  5. If the assessors have concerns over the functionality of the implementation, a team presentation of the code may be required – all team members will need to be present at the presentation. | |

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| **CO567 OOSD CASE STUDY** |
| **Case Study Start**  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.  **Cont:**  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.  **Case Study End** |
| Submission details |
| * Your assignment should be submitted in hard copy (on paper/other relevant medium). Please ensure that you include a coversheet which includes your module code, coursework number and title, and your student ID. * You are reminded of the University’s regulations on academic integrity, which can be viewed on the University website: <https://www.bucks.ac.uk/sites/default/files/2021-07/academic-integrity-policy.pdf>. In submitting your assignment, you are acknowledging that you have read and understood these regulations * Please also note that work that is submitted up to 10 working days beyond the submission date will be considered a late submission. Late submissions will be marked and the actual mark recorded, but will be capped at the pass mark (typically 40%), provided that the work is of a passing standard. Work submitted after this period will not be marked and will be treated as a non-submission. * Your submission format needs to be appropriate for a professional audience, using logical headings, tables and the enhancing use of diagrams etc. All correctly referenced in accordance with university guidelines. |

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| Before you submit |
| * Please use the provided checklist below to make sure you are ‘fit to submit’ your work * We recommend you use this checklist as soon as you get this assignment brief to help you plan your work |

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| Fit to submit: Assignment Checklist |
| This brief **assignment checklist** is designed to help you avoid some of the most common mistakes students make in their coursework.  **Have you read the assignment brief? If not, do so now!**  In it you will find details of the assessment task, word count, the assessment criteria your work is marked against, and the learning outcomes – the basis for the assessment strategy in each module.  Students often lose marks by forgetting some of the more straightforward elements of their assignments. We recommend that you “tick off” each of the points below as you prepare your work for submission. If you need any help, ask your tutor and/or visit <https://bucks.ac.uk/students/academicadvice/assessment-and-examination>  Have you read and understood the assessment criteria?  Have you **met** the learning outcomes? You will lose marks and your work may even be failed if you have not.  Have you demonstrated Have you demonstrated you can think and write *critically* in the completed work*?* This means you have supported your arguments/explanations appropriately e.g. using relevant academic sources and you have offered discussion points which extends your own or others’ viewpoints to make reasoned conclusions/judgements.  Have you maintained an *appropriate tone* throughout your work? Is your work formal, focused, developed and clear?  Have you checked the [referencing](http://www.citethemrightonline.com) in your assignment is in line with your programme requirements?  Have you proof-read your work and used spellcheck software to check your spelling and grammar?  Have you checked the presentation of your work is as specified by your tutor, for example, are font size, colour, style, line spacing and margins as the tutor specified?  Have you kept to the word count (or equivalent)? If you are not sure, check with your tutor.  Can you confirm that the work submitted is your own and maintains [academic integrity](https://www.bucks.ac.uk/sites/default/files/2021-03/academic_misconduct_policy.pdf)? |

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|  | Fail | Fail | Pass | Pass | Pass | Pass | Pass |
|  | **0-34 (F) –**  **Fail** | **35-39 E –**  **Marginal fail** | **40-49 (D)** | **50-59 (C)** | **60-69 (B)** | **70-79 (A)** | **80-100 (A+)** |
|  | **Not successful** | **Below required standard** | **Satisfactory** | **Good** | **Very Good** | **Excellent** | **Outstanding** |
| **Criterion 1**  This should include evidence of: |  |  |  |  |  |  |  |
| **Criterion 2**  This should include evidence of: |  |  |  |  |  |  |  |
| **Criterion 3**  This should include evidence of: |  |  |  |  |  |  |  |
| **Criterion 4**  This should include evidence of: |  |  |  |  |  |  |  |
| **Criterion 5**  This should include evidence of: |  |  |  |  |  |  |  |