**Kingston University, BSc (Hons) (top-up)**

**Draft Coursework – Subject to Moderation**

**Coursework Cover Sheet**

**Part 1 - To Remain with the Assignment after Marking**

|  |  |
| --- | --- |
| **Student ID:** | **Student Name:** |
| **Module Code:** | **Module Name:** |
| **Assignment number:** | **ESoft Module Leader: Mr. W A D B C Goonatillaka** |
| **Date set:** | **Date due: 7th of April 2024** |

**Guidelines for the Submission of Coursework**

1. Print this cover sheet and securely attach both pages to your assignment. You can help us ensure work is marked more quickly by submitting at the specified location for your module. You are advised to keep a copy of every assignment.

2. Coursework deadlines are strictly enforced by the University.

3. You should not leave the handing in of work until the last minute. Once an assignment has been submitted it cannot be submitted again.

**Academic Misconduct**: **Plagiarism** and/or **collusion** constitute **academic misconduct** under the University's Academic Regulations. Examples of academic misconduct in coursework: making available your work to other students; presenting work produced in collaboration with other students as your own (unless an explicit assessment requirement); submitting work, taken from sources that are not properly referenced, as your own. By printing and submitting this coversheet with your coursework you are confirming that the work is your own.

|  |  |  |  |
| --- | --- | --- | --- |
| |  | | --- | | ESoft Office Use Only:  Date stamp: work received | | |  | | --- | |  | |

**Kingston University, BSc (Hons) (top-up)**

**Coursework Cover Sheet**

**Part 2 – Student Feedback**

|  |  |
| --- | --- |
| **Student ID:** | **Student Name:** |
| **Module Code:** | **Module Name:** |
| **Assignment number:** | **ESoft Module Leader:** |
| **Date set:** | **Date due:** |

|  |
| --- |
| Strengths (areas with well-developed answers) |

|  |
| --- |
| Weaknesses (areas with room for improvement) |

|  |
| --- |
| Additional Comments |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| **ESoft Module Lecturer:** | **Provisional mark as %:** |  |
| **ESoft Module Marker:** | **Date marked:** |

**Submission deadline: 7th of April 2024 – before 3.55pm via ELMS**

**CI6320 Advanced Data Modelling**

**Coursework Assignment One**

Note: This is *an individual* assignment. While it is expected that students will discuss their ideas with one another, students need to be aware of their responsibilities in ensuring that they do not deliberately or inadvertently plagiarize the work of others.

There are two questions. Answer both.

**Question A:**

This question requires you to critically analyse and compare three data modelling paradigms, namely, Relational Data Model (RDM), Object-Oriented Data Model (OODM), and Object-Relational Data Model (ORDM).

Your analysis should address the following:

1. Core principles and characteristics of each model.

2. Merits and limitations of each model in real-world application scenarios.

Based on your analysis, create a table summarizing the key differences among the three models in terms of data representation, relationships, querying, suitability for different application types, and other relevant factors.

Provide a critical discussion on which model you consider most suitable for specific real-world application scenarios, justifying your reasoning with suitable examples.

Answer this question comprehensively within a maximum of three A4 pages (excluding references). Use proper academic formatting and cite sources using the Harvard referencing style. Demonstrate critical thinking, analysis, and effective communication of your findings.

**Question B:**

In this question, you are tasked with designing and implementing a basic Library Management System (LMS) for a university library. The librarians must be able to add, view, and manage books, journals, and members. This will involve creating a data model using Object-Relational features in Oracle.

The mandatory requirements are as follows.

1. Object Types:

* Publication: (abstract supertype)

Attributes: title (VARCHAR2(255)), publication\_date (DATE), publication\_type (VARCHAR2(20))

Methods: displayBasicInfo()

* Book: (subtype of Publication)

Attributes: author (VARCHAR2(255)), ISBN (VARCHAR2(13))

Methods: displayFullInfo()

* Journal: (subtype of Publication)

Attributes: volume (NUMBER), issue (NUMBER)

Methods: displayFullInfo()

* Member:

Attributes: member\_id (NUMBER PRIMARY KEY), name (VARCHAR2(255)), contact\_info (VARCHAR2(255))

Methods: displayInfo()

2. Tables:

* Publication: Stores basic information about all publications (books and journals)
* Book: Stores book-specific information

Journal: Stores journal-specific information

* Member: Stores member information
* Loan: (linking table)

Attributes: member\_id (FK references Member(member\_id)), publication\_id (FK references Publication(publication\_id)), loan\_date (DATE), return\_date (DATE)

3. Inheritance:

* Book and Journal inherit attributes and methods from Publication.

4. Constraints:

* ISBN in Book table must be unique and non-null.
* member\_id and publication\_id in Loan table must reference existing entries in their respective tables.
* Loan\_date cannot be in the future.

5. Testing:

* Implement methods to display basic information (Publication) and full information (Book, Journal, Member).
* Add records for books, journals, and members.
* Display all publications sorted by title.
* Display all borrowed publications by a specific member.
* Implement a simple search functionality based on title or author.

Additional Requirements are as follows (for higher attainment).

* You may implement additional features like adding categories, genres, keywords for publications, and fine management for loans.
* Utilize mapping capabilities of Oracle to create object views for easier data manipulation.
* Use at least one co-dependency by assuming a new functional requirement.
* Feel free to add more attributes and methods when and where necessary.

**General Instructions**

Format of the Report:

* Prepare a word-processed document using a standard font (e.g., Times New Roman 12 pt) and single line spacing.
* Include page numbers on the bottom right corner of each page.
* Use clear and concise language. Use spelling and grammar checkers.

Content:

* Title Page: Include the title of your report, your name, Student ID, course name, lecturer name, and date of submission.
* Introduction: Introduce the topic and purpose of your report, providing relevant background information.
* Body:
  + Organize your report into clear sections with headings and subheadings.
  + For question A, present your analysis of the data model comparison, incorporating evidence from your research.
  + For question B, provide clear evidence of your design, implementation, and testing of the object relational data model.

Conclusion:

* Summarize the key findings and recommendations if any based on your analysis.

References:

* List all sources used in your report using the Harvard referencing style consistently. Double-check the accuracy and formatting of your references.

Evidence and Plagiarism:

* Cite all sources using in-text citations and include them in your reference list.
* Do not copy and paste text from other sources without proper citation. Paraphrase information in your own words and attribute the original source.
* Use plagiarism detection tools to check your work before submission.

Submission:

* You need to submit a single document file (MS Word format) to LearnJOU; this document should include all the answers for both questions A and B. Please name the file as LastnameFirstnameA1 .doc.

**Marking Rubric**

**Question A: Comparison of Advanced Data Models (Total: 20 Marks)**

Table 1

|  |  |  |
| --- | --- | --- |
| Criteria | Description | Marks |
| Critical Analysis and Comparison | * Core principles and characteristics. * Merits and limitations. * Comparison Table. | 12 |
| Critical Discussion | * Suitability for specific scenarios. * Critical thinking and communication. | 6 |
| Bonus | * Insights into the potential future trends or emerging data modelling paradigms. * Displays exceptional clarity, organization, and writing style, enhancing the overall quality and professionalism of the answer. | 2 |

**Question B: Library Management System and the Report (Total: 75 Marks)**

Table 2

|  |  |  |
| --- | --- | --- |
| Criteria | Description | Marks |
| Data Model Design: Object Design | * Correct definition of abstract supertype Publication with appropriate attributes and method. * Accurate definition of subtypes Book and Journal inheriting from Publication. * Correct definition of the Member type. * Clear and logical use of inheritance hierarchy with appropriate relationships between types. | 20 |
| Data Model Design: Database Design | * Accurate creation of tables for Publication, Book, Journal, Member, and Loan with appropriate data types for each attribute. * Correct establishment of relationships between Loan and Member and Publication tables. * Implementation of data integrity constraints. | 15 |
| Testing | * Implementation of methods for displaying basic information (Publication) and full information (Book, Journal, Member) as specified. * Unit testing of functionalities for adding records, displaying information, searching based on title/author, and displaying borrowed publications. * Demonstration of all functionalities through clear and organized SQL statements. | 15 |
| Additional features | * Implementation of additional features like categories, genres, keywords for publications, and fine management for loans (maximum 2 features). * Object-Relational Mapping (ORM) * Utilization of Oracle's mapping capabilities to create object views for easier data manipulation. * Demonstration of effective use of object views in code for data retrieval or manipulation. | 15 |
| Co-dependency | * Identification of a new functional requirement leading to a co-dependency between existing objects. * Modification of the data model and implementation to accommodate the new requirement and maintain data integrity. | 5 |
| Code Quality | * Code is well-formatted and readable and uses proper commenting. * Code adheres to best practices and demonstrates efficient use of resources and data structures. | 5 |

**General Report Presentation (Total: 5 marks)**

Table 3

|  |  |  |
| --- | --- | --- |
| Criteria | Description | Marks |
| Formatting | * Consistent use of standard font (e.g., Times New Roman 12 pt) and single line spacing. * Page numbers present on the bottom right corner of each page. | 1 |
| Organization and Content | * Clear title page with relevant information. * Introductory paragraph with background information. * Body section with clear headings and subheadings for different functionalities. * Conclusion summarizing key findings and recommendations. | 2 |
| Citation and Referencing | * All sources used are appropriately cited within the report using in-text citations. * Consistent use of the Harvard referencing style for references. | 2 |

**Level of work expected:**

This is a major piece of work, and it is expected that you will need to do some very thorough research and that ideally your research will be as up to date as possible given that this is a very rapidly moving field. Work containing vague descriptions or unsupported assertions will be penalized.

**Feedback:**

You can invite the module-staff to review your progress and provide formative-feedback.

**Academic Integrity**:

Academic integrity means demonstrating honest, moral behaviours when producing academic work. This involves acknowledging the work of others, giving appropriate credit to others where their ideas are presented as part of your work and the importance of producing work in your own voice. Contributions by artificial intelligence (AI) tools must be properly acknowledged. As part of a learning community students share ideas and develop new ones - you need to be able to interpret and present other people's ideas and combine these with your own when producing work.

**Plagiarism (including copying, self-plagiarism and collusion)**

The act of presenting the work of another person (or people) and/or content generated by artificial intelligence (AI) tools as your own without proper acknowledgement. This includes copying the work of another student or other students.

The University expects students to take responsibility for the security of their work (i.e. with written work, to ensure that other students do not get access to electronic or hard copy of the work). Failure to keep work secure may allow others to cheat, and could result in an allegation of academic misconduct for students whose work have been copied, particularly if the origin of the work is in doubt.

**Self-plagiarism**

The act of presenting part or all of your work that has been previously submitted to meet the requirements of a different assessment, except where the nature of the assessment makes this permissible.

**Collusion**

The act, by two or more students, of presenting a piece of work jointly without acknowledging the collaboration. This could include permitting or assisting another to present work that has been copied or paraphrased from your own work.

The University also defines collusion as the act of one student presenting a piece of work as their own independent work when the work was undertaken by a group. With group work, where individual members submit parts of the total assignment, each member of a group must take responsibility for checking the legitimacy of the work submitted in his/her name. If even part of the work is found to contain academic misconduct, penalties will normally be imposed on all group members equally.

**Purchasing or Commissioning**

The act of attempting to purchase or purchasing work for an assessment including, for example from the internet, or attempting to commission, or commissioning someone else to complete an assessment on your behalf.

The procedures for investigating suspected cases of academic misconduct are set out in Academic Regulations 6 Academic Integrity - Taught Courses 2023/24

**You must meet all deadlines set. Failure to do so will result in a penalty.**

Work submitted late but within a week of the deadline will be capped at 40% and receive a grade of LP (Late Pass) unless it is not of a passing standard in which case it will receive a grade of LF (Late Fail). Work submitted within a week of the deadline without approval will get 0% with a grade of F0. If, however, you have a serious problem, which prevents you from, meeting the deadline you may be able to negotiate an extension in advance. In the first instance you should contact the module team for advice. However any extension will need to be formally agreed by the Faculty via the Mitigating Circumstances process, your work will then be marked without penalty.