Object Oriented Analysis, Design and Implementation

7CS091

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Module Leader

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Key dates and details

Assessment Type:	Individual. OO System requirement analysis, design, and Development
Assessment weighting:	(CW1 50%, CW2 50%)
Word Count	N/A
Learning Outcomes:	4
Submission Method:	Online Submission / Turnitin
Submission Date:	CW1 at 12pm 13/11/2023 (Monday) CW2 at 12pm 10/01/2024 (Wednesday)
Provisional Feedback Release Date:	**In 14 working days after submission**

Learning Outcomes

1. Critically appraise and model user requirements.
2. Produce a design for some software using object oriented principles.
3. Apply suitable industrial approaches to the implementation of a software system using Object Oriented principles.
4. Critically evaluate the use of design patterns in the global context of software development.

Description of the assessment

This coursework is completed in 2 parts, you need to apply suitable industrial approaches to the design and implementation of a software system using Object Oriented principles.

Assessment Content and Deliverables

We will have two course works (CW) but they are connected. CW1 is about the object-oriented (OO) analysis and design of a system using UML diagrams. CW2 is about updating the design of the class diagram with OO design patterns and backend implementation of the classes and objects. **You must pass CW1 and CW2 to pass the module.**

The system scenario can be selected from:

1. Hotel Management System
2. Library Management System
3. Patient Booking System
4. Room Booking System for Hospitals

CW 1 (Learning outcome 1, 2) 50%

Deliverables:

A presentation for the indicated system: The outline below provides the structure for the content of the presentation; during the lectures you will learn about the steps required to successfully design and implement the system using Object Oriented principles. You are also expected to do your own research on what should be included in the presentation.

1. Introduction (20%)

1.1 Purpose, Scope, and Objectives of the Project 5%
1.2 Project Description 5%
1.3 Project Deliverables with detailed time planning 5%
1.4 Development Environment of class diagram and objects (detail the tools and techniques used) 5%

2. Requirement collection for OO design (30%)

2.1 Requirement Collection Methodology 10%

2.2 Functional Requirements (with use-case diagram) 20%

3. OO System Design (40%)

3.2 Class Diagrams 40%

4. Structure and clarity of the presentation (10%)

CW1: What you are expected to submit:

- Appropriately formatted and structured 4-5 minutes PowerPoint slides or PDF presentation containing all relevant information of introduction, requirements and design. Presentation beyond 5 minutes will not be marked.

CW 2 (Learning outcome 3,4) 50%

Deliverables:

The implementation of the class diagram within a suitable application paradigm using OO programming language.

Implementation

Implemented code for the class diagram for CW1 using python programming language, which include:

1. **Demo refined UML class diagram with key design principles such as design pattern (30%)**
2. **Backend Coding Implementation of classes and objects** using **Python** Programming Language and Explanation of the Class Diagram. **No Graphical User Interface (GUI)** implementation is needed. **(70%)**

CW2: **What you are expected to submit:**

A zip file containing:

- Implementation Code of the Class Diagram using Python Programming Language.
- A **3-4 minutes** video that recorded the presentation of the new class diagram and backend code explanations. Video content beyond 4 minutes will not be marked.

Assessment Rubric

The assessment rubric on the next page shows the complete criteria of the CW and how you will be assessed. We will explore the content of the rubric together in a synchronous session on first week session.

When the assessment is returned you will receive a digital version of the rubric showing how you performed against each criterion. You will also receive a feedback that highlights both the strengths of the work and your key areas for development. There will be an opportunity to discuss these with your personal academic tutor.

Marking Grid – CW1

Marking criteria	ZERO	< 39	40-49	50-59 (Passing grade band)	60-69	70-100
Introduction (20)	Work of no merit or absence	Little to no evidence of attempt to identify purpose, scope, and objectives of the Project. Not thought out or planned. Difficult to see where this is going.	Minimal justification and the project deliverables and plans are not clear enough to see what will be done **when**, although what will be done is articulated.	Plans clear enough to see mostly what will be done and **when.** If someone else were to take these plans they could likely complete the project on time, although there are a few gaps.	Good justification and plans clear enough to see what will be done **when.** If someone else were to take these plans they too could mostly complete the project on time	Very well thought out and planned. Very clear set of objectives. If someone else were to take these plans they too could complete the full project on time.
Software Requirements (30)		No requirements collection and specification at all.	Minimal requirements collection and specification. It is hard to understand with no detailed explanations.	Satisfactory requirements collection and explanations. But there is no detailed justifications. Simple use case diagram that needs a lot of improvements.	Good requirements collection and explanations Clearly understand why and where these requirements come from. Appropriate use case diagram.	Excellent requirement collection and explanations. Clearly understand why and where these requirements come from. Excellent use case diagram that shows actors, use cases and relationships between them.
UML Model (40)		Poor class diagram.	Class Diagram with all classes identified but not in the correct way.	Class diagram with formal representation of attributes and functions. No multiplicities and relations presented.	Class diagram with appropriate multiplicities and relations and formal representation of attributes and functions with inheritance.	Excellent multiplicities and relations and a formal representation of attributes and functions on the class diagram with inheritance and abstractions.

Presentation (10%)		Poorly presented, no structure and careless presentation. Layout poorly and randomly designed.	Satisfactory presentation with an obvious attempt to provide formal structure that is careless in places. Clear gaps and issues throughout.	Good presentation which is generally well structured. Work contains obvious gaps in the descriptions & justifications.	Very good presentation, clear structure utilised, may contain some gaps.	Excellent presentation, carefully and clearly presented information with the right amount of detail throughout.

Marking Grid – CW2

Marking criteria	**Zero**	**< 39**	**40-49**	**50-59 (Passing grade band)**	**60-69**	**70-100**
UML refinement (30)	Work of no merit or absence	Incorrect refinement of UML class diagrams.	Refinement of UML Class diagram but no design pattern involved.	Refinement of UML Class diagram with design pattern involved but with clear gaps and issues.	Good refinement of UML Class diagram with design pattern involved with couple of mistakes.	Excellent refinement of UML Class diagram with design pattern involved with no mistakes.
Class Diagram Coding(70)		Minimal class diagram code development.	Backend code explanations are not sufficient with lots of bugs.	Backend code is clearly explained but not 100% follows the class diagram design and with some bugs.	Backend code is clearly explained and 100% follows the class diagram design with no obvious bugs.	Excellent backend code implementation follows the class diagram design and without bugs.

Anonymous Marking

You must submit your work using your **student number** to identify yourself, not your name. You must not use your name in the text of the work at any point. When you submit your work in Turnitin you must submit your student number within the assignment document and in the *Submission title* field in Turnitin.

Assessment Regulations

The University's regulations, policies and procedures for students define the framework within which teaching and assessment are conducted. Please make sure you are familiar with these regulations, policies and procedures.