


**3+0 Bachelor of Science (Hons) in Computer Science, in collaboration with Coventry University, UK****3+0 Bachelor of Science (Hons) in Computing, in collaboration with Coventry University, UK**[Coursework cover sheet](#)**Section A - To be completed by the student.**

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Semester: 2	
Session: <b>April 2023</b>	
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Module Code and Title: <b>4067CEM Software Design</b>	
Assignment No. / Title: <b>Continuous Assessment</b>	% of Module Mark: <b>50</b>
Hand out Date: <b>12 May 2023</b>	Due Date: <b>Task 1: 02 June 2023, by 11.59pm.</b> <b>Task 2: 07 July 2023, by 11.59pm</b> <b>Task 3: 23 June 2023, by 11.59pm.</b> <b>Task 4: 23 June 2023, by 11.59pm.</b> <b>Task 5: 23 June 2023, by 11.59pm.</b>
Penalties: No late work will be accepted. If you are unable to submit coursework on time due to extenuating circumstances, you may be eligible for an extension. Please consult the lecturer.	

Declaration: I/we the undersigned confirm that I/we have read and agree to abide by the University regulations on plagiarism and cheating and Faculty coursework policies and procedures. I/we confirm that this piece of work is my/our own. I/we consent to the appropriate storage of our work for plagiarism checking.

Signature(s): 

### Section B - To be completed by the module leader

Intended learning outcomes assessed by this work:

Understand and apply appropriate concepts, tools, and techniques to each stage of the software development.

Understand and apply design patterns to software components in developing new software.

Demonstrate an understanding of project planning and working to agreed deadlines, along with professional, interpersonal skills and effective communication required for software production.

5. Demonstrate an awareness of, and ability to apply, social, professional, legal, and ethical standards as documented in relevant laws and professional codes of conduct such as that of the Malaysian National Computer Confederation.

Marking scheme	Max	Mark
1. User Story Mapping	20	
2. Setting up a GitHub Repository	10	
3. Creating a Class diagram and design pattern selection	30	
4. Creating a Prototype User Interface and Usability Testing	20	
5. Discuss the ethical issue related to the software	20	
Total	100	

## TASK 3: Creating of the Class Diagram and the Design Pattern Selection

### 3.1 Introduction

This Task is a continuation of Task 1 which was the creation of the user story mapping according to the user stories obtained. This task will be highlighting the classes along with the relationships between each class.

### 3.2 Class Diagram

A class diagram is a type of Unified Model Language (UML). In short, a class diagram can be defined as an overview of a system. There are three components which are found in a typical class diagram which includes class, artefacts, and relationships.

In a class diagram, a class represents an object which breaks down into 3 different parts which are name, attributes, and methods. The artefacts represent the entities and the relationships between each class represents the connection between the classes which includes 5 types which are inheritance, simple association, aggregation, composition, and dependency.

Below shows the class diagram for the task:

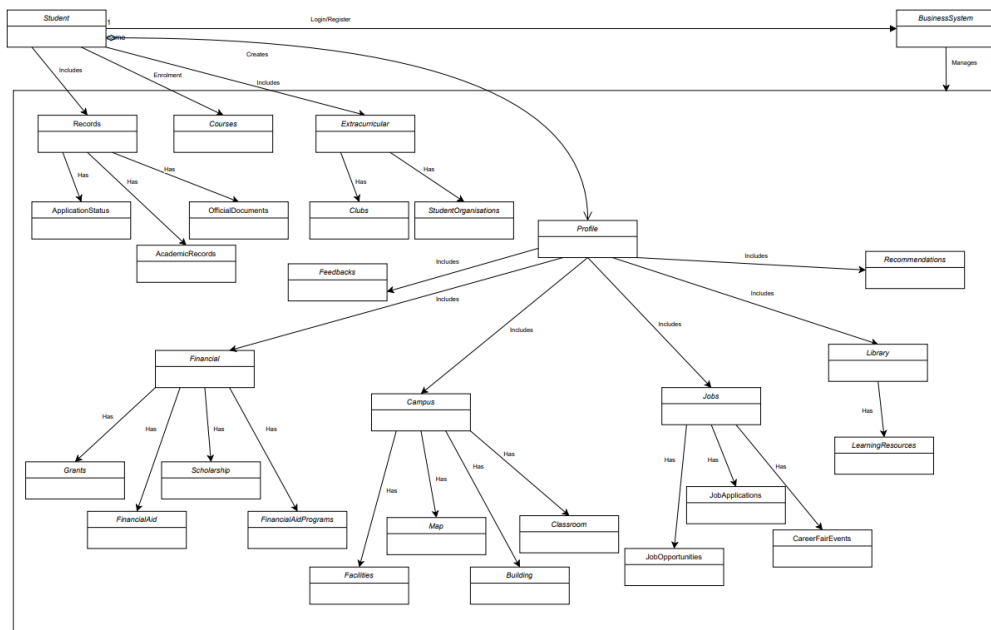


Figure 3.2.1: Class Diagram for Student Business System for College

The above diagram shows a class diagram for Student Business System for College based on the user stories obtained during task one along with the user story mapping.

1. BusinessSystem:

- Manages the overall system.
- Allows users to register and enroll into courses, look for resources, and retrieve information.
- Contains records on academic and other documents

2. Student:

- Represents the student or user in the system
- Manages student profile which also includes personal information details
- Able to enroll into courses and take part or register for extracurricular activities.
- Able to access user records which includes the application status, academic records, and user's official documents.

3. Records:

- Contains important records or status for current users.
- Manages the application status, academic records, and official documents

4. ApplicationStatus:

- Contains and manages application status which the current user applied for such as scholarship applications and so on.

5. AcademicRecords:

- Contains and manages current user's academic records which would include overall GPA, Course results and so on.

6. OfficialDocuments:

- Contains and keeps or manages current user's official documents such as user's application form, user's certificates and so on.

7. Courses:

- Represents the business course.
- Manages course-related information.
- Able to access overview of course along with the course assignments, course overview, course materials and so on.

8. Extracurricular:

- Contains information or news on extracurricular activities and requirements.

9. Clubs:

- Contains a selection of clubs for current users or students to enroll in.

10. StudentOrganisations:

- Contains a selection of student organisations for current users or students to enroll in.

11. Profile:

- Contains the menu of a selection able to be accessed by the users.

12. Feedbacks:

- Contains feedback forms on student evaluations, feedback for facilities, feedback for professors, and so on.

13. Financial:

- Manages user's financial processes or status.

14. Grants:

- Contains a selection of available grants.
- Manages the application of grants.

15. FinancialAid:

- Contains a selection of available financial aid.
- Manages the application of financial aid.

16. Scholarship:

- Contains a selection of available scholarships.
- Manages the application of scholarships.

17. FinancialPrograms:

- Contains a list of available financial programs for students.

18. Campus:

- Contains and manages the information on campus such as campus activities, facilities and so on.

19. Facilities:

- Contains information on the available campus facilities along with the location.

20. Map:

- Contains a map of the campus for students to navigate their way easily around campus grounds.

21. Building:

- Contains information on campus buildings and where they are located.

22. Classroom:

- Contains information on where classrooms are located and in which building, they are located.

23. Jobs:

- Represents a Job Board for students.
- Contains information on Job Opportunities, Job Applications, and Career Fair Events.

24. Library:

- Contains online learning resources for students such as e-journals and so on.

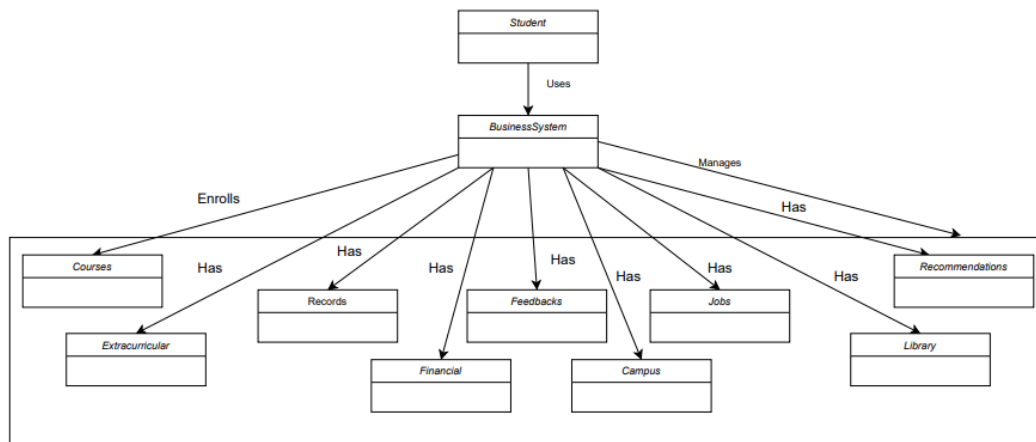
25. Recommendations:

- Contains information on recommendations for students according to the student's courses.

### 3.3 Design Pattern

A design pattern is a proven reusable solution to software design problems. Design patterns provide help for developers to create a more efficient and maintainable structuring code by providing suitable approaches and guidelines.

Below shows the class diagram for the task:



**Figure 3.3.1: UML Diagram for Strategy Pattern**

The above figure shows the Unified Model Language (UML) for the Strategy Pattern based on the tasks.

The façade pattern simplifies the usage of a complex subsystem by providing a simple user interface which hides the complexity behind the system and allows the users to interact with the system without having to deal with its complexities. This promotes maintainability and readability while also enhancing modularity and flexibility.