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SOFTWARE DESIGN • Creating a Class diagram and design pattern selection (30%)

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CHOW Ching Huey -

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1 4067CEM Software Design-APR 2022 INTI International College Penang School of Engineering and Technology

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 Full Name: Chow Ching Huey

1 CU Student ID Number: 12673195

Semester: 2

Session: April 2022

Lecturer: 1 Nadhrah Abdul Hadi (nadhrah.abdulhadi@newinti.edu.my)

Module Code and Title: 4067CEM Software Design

Assignment No. / Title: 1 Continuous Assessment % of Module Mark: 50

1 Hand out Date: 22nd April 2022 Due Date: Task 1: 2 13 May 2022, by 11.59pm

Task 2: 2 1 July 2022, by 11.59pm

Task 3: 1 19 June 2022, by 11.59pm. Task 4: 1 19 June 2022, by 11.59pm. Task 5: 1 19 June 2022, by 11.59pm.

Penalties: 1 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: 1 I/we the undersigned confirm that I/we have read and agree to abide by the University regulations on plagiarism and cheating and Faculty course-work policies and procedures. I/we confirm that this piece of work is my/our own. I/we consent to appropriate storage of our work for plagiarism checking.

Signature(s): _____

(1) Section B - To be completed by the module leader Intended learning outcomes assessed by this work: 1. (1) Understand and apply appropriate concepts, tools and techniques to each stage of the software development

2. (1) Understand and apply design patterns to software components in developing new software

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

5. (1) 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. (2) User Story Mapping 2. Setting up a GitHub Repository 3. (1) Creating a Class diagram and design pattern selection

4. (2) Creating a Prototype User Interface and Usability Testing 5. (1) Discuss the ethical issue related to the software 20

10

30

20

20

Total 100

TASK 3: (1) CREATING A CLASS DIAGRAM AND DESIGN PATTERN SELECTION

Simple Class Diagram /updated by /updated by

Figure 1 · This is the simple class diagram of the College Event System in INTI International College Penang. · 12 Classes: 1) Admin

2) Account

3) Student

4) Club

5) Member

6) Committee

7) Post

8) Event

9) Facility Booking

10) Participant

11) Feedback

12) Analytics

13) Notifications · One to many Account(s) are created/deleted/updated by one to many Admin(s), and there may be a group of admins. The admins use students' emails for student accounts and clubs' emails (given by club presidents) to create club accounts. They can delete once they are of no use. · After that, there are one to many Student(s) and one to many Club(s), and each of them has one account. · One to many Student(s) can join/unjoin zero to many Club(s) to becomes club members, which leads to one to many clubs having one to many members as a club will exist only if there is someone is in the club. Four to many Committee(s) are then picked from among the Members which is four to many. They are set as four to many as there are president, vice president, secretary, treasurer, and trainees to be passed on the positions to. · One to four Committee(s) organize one to many Event(s) in the background. · But for managing the club account, only one to two of them (club president and vice president) have the password to access the account. The rest of the committee team are the same level as club members with fancy committee positions in their club page. Hence, one to two Committee(s) (club president and vice president) can use their only one club account to perform tasks as a club: 1) Create/delete/update zero to many Post(s), as the club may not have posts yet, and delete zero to many Post(s) 2) Organize zero to many Event(s), as the club may not have events yet · All students can either view, like or save posts posted by clubs or do nothing about them. Hence one to many Student(s) view/like/save zero to many Post(s). · Events may have facility/room booking, hence one to many Event(s) has zero to many Facility Booking(s). One to many Event(s) and one to many Facility Booking(s) are approved/disapproved by one to many Admin(s). · Students (non-members) and members attend to events, hence one to many Student(s) and one to many Member(s) become as one to many Participant(s) This implies that one to many Participant(s) attends one to many Event(s). · After attending the event or after the event ends, it is needed to give ratings and feedback to that event. One to many Event(s) have one to many Feedbacks(s). Hence, there is one to many Participants(s), and each of them gives one Feedback. · One to many Feedback(s) are stored in one Analytics.

· Each account has one to many Notification(s).

(3) UML Class Diagram Representing the Design Pattern

The design pattern used for the class diagram is Facade Pattern. It is a structural design pattern that encapsulates a subsystem to hide the subsystem's complexity, and acts as a point of entry into a subsystem without adding more functionality inside itself. The class diagram representing the design pattern is as shown below:

Figure 2 · There are hierarchical, multilevel, and single inheritances which would combine as a hybrid inheritance shown in the class diagram in Figure 2. Admin, Student and Club are accounts inherited from User. Student also has its own 2 child classes which are Member and Participant. Since students need to become a club member to become a club committee, Committee is inherited from Member. For posts, as Event Post is another version of Post, Event Post is the child class of Post. · There are classes where the object cannot exist without their parent class object. Without a User account, there will be no Notifications. Without Event, there will be no Analytics, Facility or Room Booking and Feedback. Without a Club account, there will be no Event, Post and Member and no Analytics too. · All the relations are the same as explained in the simple class diagram.

2

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

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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	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

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Creating a Class diagram and design pattern selection	Creating a Class diagram and design pattern selection

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Creating a Prototype User Interface and Usability Testing 5.	Creating a Prototype User Interface and Usability Testing 5

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Discuss the ethical issue related to the software 20	Discuss the ethical issue related to the software 20

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CREATING A CLASS DIAGRAM AND DESIGN PATTERN SELECTION	Creating a Class diagram and design pattern selection

3 Student paper	75%
Student paper	Original source
UML Class Diagram Representing the Design Pattern	UML Diagram with Design Pattern