CPT203 Software Engineering I

Coursework 2 – Project Report

Release date	12th Nov 2024
Submission date	12th Dec 2024
Coursework type	Fill the answers into the templates, and submit as one PDF
Percentage in final marks	15%
Submission method	CPT203 of Learning Mall Core
Late submission policy	5% of the awarded marks shall be deducted for each working day after the submission date, up to a maximum of five working days. Late submission for more than five working days will be not accepted.
Important notes	- Any use of Generative AI is not allowed. - Plagiarism results in award of ZERO mark; all submissions will be checked by TurnItIn. - The formal procedure for submitting coursework at XJTLU is strictly followed. Submission link on Learning Mall will be provided in due course. The submission timestamp on Learning Mall will be used to check late submission.

This document contains
> Section 1. Introduction
> Section 2. Case and tasks with marking scheme
> Section 3. Submission template
> Section 4. Peer review form template

Section 1. Introduction

Learning Outcomes be assessed

A. Appreciate and describe the issues and methods involved in designing and building computer systems to meet business goals.

C. Appreciate the need to ensure that the implementation of a design is adequately tested to ensure that the completed system meets the specifications.

D. Apply an object-oriented approach to the design and development of software systems and their components.

F. Discuss the role of quality management systems and continuous improvement in Software Engineering.

General instruction

1. Read the case study in Section 2 and solve the involved 7 questions.

2. The page limit of this coursework is 5-page max, excluding the cover page, figures, codes and appendix.

3. We will facilitate grouping on the learning mall. Students will be self-grouped or allocated to a team of 5 students.

4. Use the template provided in Section 3 for this work, and use the peer review form in Section 4.

5. Student contribution and marking.
   The submission is a group work as in Section 3. The total mark is 100.
   In a team, each member may contribute differently to the submission. Therefore, students are required to fill up, sign, and submit the peer review form in Section 4. The contribution (%) in the form indicates the overall contribution of a team member on their submission. The team should arrange a meeting to discuss and complete the peer review form in the presence of all members. The contribution percentage for everyone must be agreed upon by all team members. In the case where a contribution cannot come to an agreement, the team could seek help from the module leader.

Section 2. Case and related tasks with marking scheme

You are tasked with designing a Simple Hotel Booking System. The system allows customers to search for available rooms, book rooms, and make payments. The hotel management staff can add new rooms to the system, update room availability, and view customer bookings. Based on the scenario, the core components of the system therefore include:

- Customer: The customer can search for rooms, book them, and make payments.
- Room: Represents the hotel rooms with relevant information like room type, price, and availability.
- Booking: Handles the customer's booking details.
- Payment: Processes payments for the booked rooms.
- HotelManagement: Allows the management staff to update room availability and view customer bookings.

Q1. You are supposed to draw the class diagram for the case above based on the design principles we learned. Make sure you specify the attributes and methods that could potentially involve in each class you designed (10 marks).

Q2. Evaluate the design principles in the class diagram. Make sure you talk about them together with the specific examples from your design and illustrate why you decide to take the principles and how they improve the system (15 marks).

Once the design of the class diagram completed, the customers require you to provide the UI design for the following core functions based on the interface design principles:

- Customer Room Search and Booking
- Payment Processing
- Room Booking Management

Q3. You are required to create the UI pages of these functions. You can assume any detailed information on the pages (e.g., the booking record). Both simple wireframes (or sketches) and pages built in prototyping tools (e.g., Figma, Modao) would be acceptable. (15 marks)

Q4. For each of the UI page, illustrate what interface design principles are used, how they are applied with specific examples, and how they improve the interaction between the system and users (e.g., equality, diversity and inclusion). (20 marks)

After the system is implemented, different types of testing should be conducted to ensure the quality of the system. Of them, we are required to start with a small function of customer entering check-in and check-out dates.

Q5. Please describe how you will test the function in cases that it is working and NOT working (e.g., boundary input). For each of the test cases, please also specify what can be the solution to the problem. (10 marks)

According to customers, the system is expected to throw exception in the following two conditions:
- When the payment amount is negative.
- When the payment method is not "Alipay" or "Wechat"

Q6. Fill in the following code first and provide test cases verifying if the exceptions are thrown successfully. (10 marks)

```java
public class Payment {
    private int paymentID;
    private int bookingID;
    private double amount;
    private String paymentMethod; // Example: "Alipay", "Wechat"
    private boolean isProcessed;

    public Payment(int paymentID, int bookingID, double amount, String paymentMethod) {
        this.paymentID = paymentID;
        this.bookingID = bookingID;
        this.amount = amount;
        this.paymentMethod = paymentMethod;
        this.isProcessed = false;
    }

    public boolean processPayment() throws IllegalArgumentException {
        // Q6.1 - Fill in the Code
    }
```

```
        public boolean isProcessed() {
            return isProcessed;
        }

        public double getAmount() {
            return amount;
        }
    }
```

//Q6.2 - Test cases

Q7. With the system becoming better, we reach to the stage of user testing for our system. Please describe what would you organize this process as a team. Make sure the potential problems and related solutions are also considered for continuous improvement of the product. (20 marks)

Section 4. Submission notes and submission template:

Submission notes:
- You must submit the report in Word or PDF format via Learning Mall by the above submission date. Name the report as CPT203-CW2-groupnNumber.pdf

- Use font size 11.

Submission template
Students are encouraged to copy the template below and enter your answers.

2024/2025 Semester 1
<Date>

Group number: < x >
Student 1 Name: <Shang Zhang>   Student 1< ID: 123456> who submits this on the learning mall

Student 2 Name: Student 2 ID:
Student 3 Name: Student 3 ID:
Student 4 Name: Student 4 ID:
Student 5 Name: Student 5 ID:

Q1. You are supposed to draw the class diagram for the case (10 marks).

<Your answer with the diagram >

Q2. Evaluate the design principles in the class diagram. (15 marks).

<Your answer>

Q3. You are required to create the UI pages of these functions. (15 marks)

<Your answer>

Q4. For each of the UI page, (1) illustrate what interface design principles are used, (2)how they are applied with specific examples, and (3)how they improve the interaction between the system and users (e.g., equality, diversity and inclusion). (20 marks)

<Your answers:
(1)
(2)
(3)>

Q5. Please describe how would you test the function in cases that it is working and NOT working (e.g., boundary input). For each of the test cases, please also specify what can be the solution to the problem. (10 marks)

<Your answers>

Q6. Fill in the following code first and provide test cases verifying if the exceptions are thrown successfully. (10 marks)

```
public class Payment {
    private int paymentID;
    private int bookingID;
    private double amount;
    private String paymentMethod; // Example: "Alipay", "Wechat"
    private boolean isProcessed;

    public Payment(int paymentID, int bookingID, double amount, String
paymentMethod) {
        this.paymentID = paymentID;
        this.bookingID = bookingID;
        this.amount = amount;
        this.paymentMethod = paymentMethod;
        this.isProcessed = false;
    }

    public boolean processPayment() throws IllegalArgumentException {
        // Q6.1 - Fill in the Code
```

```
  }

  public boolean isProcessed() {
    return isProcessed;
  }

  public double getAmount() {
    return amount;
  }
}
```

//Q6.2 - Test cases

Q7. Please describe what would you organize this process as a team. (20 marks)

<Your answers>

Section 4. Peer review form template

CPT203 Coursework
Peer review
Individual Contribution for Group Report

Group Number: <x>

Name	ID Number	Contribution (%) Please enter an integer, for example 15% contribution, please enter 15. The sum of this column should be 100	Signature
1. <my name>	<123456>	<15>	
2.			
3.			
4.			
5.			

END