

COIT12200 Software Design and Development (T1 2022)

Assessment item 3 — Applied Project (paired work)

Due date:	Week 13 – 11:45pm (AEST), Friday (10 June 2022)	ASSESSMENT
Weighting:	40%	
Length:	N/A	

3

1.Objectives

The purpose of this assessment item is to assess your skills attributable to the following learning outcomes.

- Apply software design and development principles
- Complete appropriate documentation for requirements, system modelling and design, software implementation, testing and evolution
- Illustrate a detailed design for a layered information system using appropriate design methods
- Implement an information system, consisting of presentation, application and data layers.
- Use quality management in a range of different design and development scenarios.

2. Assessment Task

For this project, your task is to design and implement a Java desktop application named Vehicle Service Management System (**VSMS**) with a team consisting of 2 students. The specifications for the application are provided in Section 3. The assessment task includes design, implementation and testing of the application software. More details on the task requirements are described below.

(1) Document Design and Test

Provide a comprehensive design and test document that addresses the following requirements.

- (i) Requirements specification
Analyze the given case-study and application scenario, and specify the functional and non-functional requirements.
- (ii) The architectural design
Provide a system architectural design.
- (iii) UML class diagram (MVC or MVP pattern)
Identify the classes and develop a UML class diagram with all necessary classes and interfaces to be implemented in your project.
- (iv) User interface design
Describe the design of your user interface. Particularly explain button & radiobutton events and their functionalities.

- (v) Database schemas and design
Include an E-R diagram, tables & attributes, primary keys and foreign keys, and the relationships. Provide sample data in three tables in this document (these data will also be required to populate your database). Also provide the SQL scripts to create the database tables and insert sample data.

Note: Use the following naming rules in your database implementation and java code.

Database name: CarServiceDB, three table names: Customers, Vehicles, Services.

user name: root, password: password

- (vi) Testing
After completing your implementation, thoroughly test your program to demonstrate that the program functions as specified. Report any anomalies, errors or functionalities that do not work correctly. Discuss possible reasons for the issues that you find.

Provide a test plan with sample data, expected results and actual results. Include evidence of testing by providing screen shots. You should include test data for correct and incorrect input.

(2) Implementation

Provide the complete implementation and testing for the software system (VSMS) as required. The implementation should adhere to the MVC or MVP design pattern with data persisted to a relational database using MySQL Server.

Provide the NetBeans project containing the complete source code (using Apache NetBeans Java with Ant).

3.Problem Specification (Case-study)

For this project, your task is to design and develop a Java desktop application that has a range of functionalities similar to a software system used by a car service firm to manage their vehicle service records. The system is to be named the Vehicle Service Management System (VSMS). Users of the software will be the administrative staff who make bookings for car services as per customers' requests and managers of the service firm. The application scenario is similar to a real life situation where we need to book a service for a car. Customers will either make a phone call to the service firm or go to their service desk to make a booking. The administrative staff will enter a service record with customer, vehicle and service details into the VSMS.

The VSMS has a front-end graphical user interface (GUI) and a back-end database system. The administrative staff should be able to enter the customer's personal information including first name, last name, address and phone. The staff should also be able to enter the vehicle details including the registration number, make, model, the manufactured year, and the number of kilometers on the odometer. An example of the vehicle entry looks like (SUN007, Toyota, Camry, 2015, 60000). The service details to be recorded include the service number, a brief description of the service, service date, the price, and the associated vehicle's registration number.

The staff should be able to search the VSMS system first to see if a customer is an existing customer or a new customer. It is common that a customer may have more than one vehicle that needs to be serviced. A vehicle generally undergoes regular services (such as once per year).

The staff should be able to:

- a) Search customer by name or phone

- b) Update customer's address or phone
- c) Add a vehicle to a new customer or an existing customer
- d) Add a service booking of a vehicle
- e) Display all service bookings that are sorted by the price from the lowest to the highest
- f) Search a service booking by the vehicle registration number
- g) Cancel a particular service booking

The manager of the service firm would like to view the report with the following statistical data:

- a) The minimum, maximum, and average price of all services offered
- b) The number of vehicles serviced by make
- c) A simple bar chart to show the top 3 brands (i.e. makes) by number of services

The manager and staff are not ICT trained, and so the display of information should have informative error message. The report will be generated and displayed appropriately, using the data from the database (which should be possible at any time). There is no need to record these statistical results in the database. The data for customers, vehicles, and services should be stored in the database which you are to create using MySQL Server.

4. Teamwork Report (Individual)

A student, who completes the whole project as a member of a productive team, should include your report answers addressing the following questions.

Template A

1. Team Details
 - a. Team Name (optional):
 - b. Your Name and Student ID:
 - c. Team Leader (Name and Student ID):
 - d. Other Team Members (Name and Student ID):
2. Teamwork Report
 - a. Describe team forming, task assignment and your role and responsibility, in addition to the project timeline (tasks allocated and completion dates)
 - b. Describe how the teamwork is conducted for the project
 - c. Describe a collaborative problem in the project and how the problem was negotiated and resolved by the team.

If you separate or quit a team in the middle of project, use the following format and address the following questions.

Template B

1. Team Details
 - a. Team Name (optional):
 - b. Your Name and Student ID:
 - c. Team Leader (Name and Student ID):
 - d. Team Members (Name and Student ID):
2. Teamwork Report
 - a. Describe team forming, task assignment and your role and responsibility, in addition to the project timeline
 - b. Describe why the teamwork has failed

- c. Describe and justify the impact on you and other team members caused by the failure of teamwork

Note: this part is to address a team member's own individual experience with teamwork. The document is not shared between the team members; each team member must submit his/her own document individually. Using the same contents or copying content for this part by two or more team members will be treated as plagiarism.

Submission for Teamwork report (Part 2)

Every team member is to prepare the report in a Microsoft Word document. This part will be marked for each team member.

You must submit your assignment via the online submission system from the unit Moodle site. **Any hardcopy or email submission will not be accepted. Late submissions will not be accepted after the marked assignments are returned**

Note: You must use Apache NetBeans Ant to implement your project. Do **not** use *NetBeans Java with Maven*.

5. What to submit for this assignment

The team leader for each team must submit a zipped file of the entire project (NetBeans project) with source code and a word document for the design and testing.

All students must submit the Team Work report as specified in Section 4. Do not include the word documents in the zip file, you must submit it as a separate file.

Marking Scheme of the Project

Marking Criteria	Available Marks
Part 1: Software Implementation and Documentation (team leader submission)	36
Software implementation	26
1. The application is compilable and runnable. Clear and exit buttons work.	1
2. Uses MVC or MVP design pattern	2.5
3. Database connection and close works correctly	1
4. GUI implementation meets requirements	2
5. Database correctly implemented	1.5
6. Customer add, search and update work correctly	2.5
7. Vehicle add to Customer correctly implemented	3.5
8. Add a service booking work correctly	2
9. Display all service bookings works correctly	2
10. Search a service booking works correctly	2
11. Cancel a service booking works correctly	1
12. Statistical data is calculated and display (including barchart)	4
13. Exception handling works correctly	1
Design and Test Report	10
1. Requirements specification	1
2. The architectural design	0.5
3. UML class diagram	2

4. User interface design	1.5
5. Database schemas and design	1.5
6. Testing	3.5
Part 2: Teamwork Report (individual submission, either Template A or Template B)	4
Template A	4
1. Describe team forming, task assignment , your role and responsibility and the project timeline	1.5
2. Describe how the teamwork was conducted for the project	1.5
3. Describe a collaborative problem in the teamwork and how the problem was negotiated and solved by the team	1
Template B (In this case, the student needs to submit their project)	4
1. Describe team forming, task assigning, your role and responsibility and the project timeline	1.5
2. Describe why the teamwork failed	1.5
3. Describe and justify the impact on you and other team members caused by the failure of teamwork	1
Sub total for Assignment 3	40
Late Penalty for Part 1 (applied to all team members)	-1.8 (5% of 36) for each calendar day (either full or part)
Late Penalty for Part 2 (applied to individual team members)	-0.20 (5% of 4) for each calendar day (either full or part)
Plagiarism Related Penalty	
Total for Assignment 3	

Note: if your programs does not work, only a small of amount marks may be allocated based on a review of the code.