University of Sunderland

Student NAME:
MODULE CODE: CET3016
MODULE TITLE: Enterprise Software Engineering
MODULE LEADER: Sardar Jaf
SUBMISSION DATE AND TIME: As stated in the assignment submission page on Canvas for this module ASSIGNMENT: 1

Academic Misconduct is an offence under university regulations, and this involves:

- **Plagiarism** – where you use information from another information source (including your previously submitted work) and pass it off as your own. This can be through direct copying, poor paraphrasing and/or absence of citations.
- **Collusion** – where you work too closely, intentionally, or unintentionally, with others to produce work that is similar in nature. This can be through loaning of materials, drafts or through unauthorised use of a fellow student's work.
- **Asking another person to write your assignment** – where you ask another individual or company to complete your work for you, be that paid or unpaid, and submit it as if it were your own.
- **Unauthorised use of artificial intelligence** – where you use artificial intelligence tools to generate your assignment instead of completing it yourself and/or where you have not been given permission to use artificial intelligence tools by your module leader. Please complete the following declaration around you use of artificial intelligence tools in your assignment.

STATEMENT ON USE OF ARTIFICIAL INTELLIGENCE TOOLS:

• I have used artificial intelligence tools to generate an idea for my assignment:	**YES/NO**
• I have used artificial intelligence tools to write my assignment for me:	**YES/NO**
• I have used artificial intelligence tools to brainstorm ideas for my assignment:	**YES/NO**
• I have used artificial intelligence tools to correct my original assignment:	**YES/NO**

DECLARATION

- I understand that by submitting this piece of work I am declaring it to be my own work and in compliance with the university regulations on Academic Integrity.
- I confirm that I have done this work myself without external support or inappropriate use of resources.
- I understand that I am only permitted to use artificial intelligence tools in line with guidance provided by my Module Leader, and I have not used artificial intelligence tools outside this remit.
- I confirm that this piece of work has not been submitted for any other assignment at this or another institution prior to this point in time.
- I can confirm that all sources of information, including quotations, have been acknowledged by citing the source in the text, along with producing a full list of the sources used at the end of the assignment.
- I understand that academic misconduct is an offence and can result in formal disciplinary proceedings.
- I understand that by submitting this assignment, I declare myself fit to be able to complete the assignment and I accept the outcome of the assessment as valid and appropriate.

University of Sunderland

Please read **all** instructions and information carefully.

This assignment contributes 40% to your final module mark and will assess the following learning outcomes:

- Critically assess and justify the selection of appropriate software engineering lifecycles and development methodologies in the design and implementation of complex systems. (Learning Outcome 1).
- Analyse and design robust and secure software applications using industry-standard frameworks, tools and techniques. (Learning Outcome 2).

Important Information

You are required to submit your work within the bounds of the University Infringement of Assessment Regulations (see your Programme Guide). Plagiarism, paraphrasing and downloading large amounts of information from external sources, will not be tolerated and will be dealt with severely. Although you should make full use of any source material, which would normally be an occasional sentence and/or paragraph (referenced) followed by your own critical analysis/evaluation. You will receive no marks for work that is not your own. Your work may be subject to checks for originality which can include use of an electronic plagiarism detection service.

For this assessment you are asked to submit an individual piece of work, therefore the work must be entirely your own. The safety of your assessments is your responsibility. You must not permit another student access to your work.

*Referencing for this assessment should be done using the **Harvard referencing system**. (see your Programme Guide).*

You are allowed to use AI tools in a supportive role during assessments. However, you must declare in your submission which tools you used and how you utilised them. Examples of acceptable use of AI tools include:

- *Drafting and organising content*
- *Providing limited support in the writing process*
- *Acting as a support tutor*
- *Assisting with specific processes, such as translating content*
- *Offering feedback on content or proofreading*

However, you cannot use AI tools to complete the project on your behalf; all work must be done by yourselves. This is to ensure that the work accurately reflects your understanding and effort, which are significant parts of your learning process. You should validate any AI-generated content before using it.
You are expected to upload your work directly. Submitting links to files saved in the cloud will not be accepted and will result in a zero mark. Ensure that the actual files are uploaded to Canvas and are readily accessible to the assessor. After submitting your files, it is essential to verify that you can retrieve and open them. It is your responsibility to ensure that the files are not corrupted at the time of submission, as this could result in the loss of your work. If you encounter any issues, report them immediately to the help desk, copying your lecturer, and seek alternative arrangements if necessary.

University of Sunderland

Submission instruction:

Submission Date and Time	Check Canvas submission page for date and time of submission
Submission Location	Digital copy (word document) via Canvas
Document Format	1. Produce analysis and design documentation for a proposed software solution, demonstrating industry-standard frameworks, tools and techniques. Include a methodology section to critically assess and justify appropriate software engineering lifecycles and development methodologies. Your report should be approximately 1500 words.
Assignment weight	40%
Other requirements	You must adhere to the above assessment requirements. Your source code will be checked for plagiarism.

University of Sunderland

CET3016 Enterprise Software Engineering

Assessment 1

Scenario

You have recently been contacted by a local mortgage broker company (SunMortgages Ltd) for the design of a system to support the company in managing their client records. The company has two types of clients: property development companies, and local people. Additionally, the company acts as a broker between its clients and a national bank.

SunMortgages Ltd would like to be able to manage its customers' records in the most efficient, secure, and accessible way possible. Your task is to write a proposal to recommend the company to design such system.

Although the system is to be built for SunMortgage Ltd, the system should be accessible to the company's staff and its customers. The system should allow SunMortgage Ltd access its bank clients to retrieve the latest mortgage deals the bank offers to the broker.

You are asked to include the following items in your proposal:

1. *A system architecture that would be best for the type of software you want to propose.*
2. *The generation of a set of system designs to reflect the main component of the system*
3. *A report to justify your proposed architecture and design decisions*

Below is more detail on each of the above items:

Task 1

System architecture (15%)

You should identify suitable architecture that would best support the company to store its clients information. The software architecture should allow future expansion of the company so that larger numbers of clients are handled efficiently if the company decides to go international. Therefore, software scalability is important. Also, the proposed architecture should make all stored information accessible by the company, property developers, and individual customers. Your proposed architecture should have specific access levels for different types of users. Finally, there should be good consideration of system and data security. The architecture should consider the way the system allows the company to communicate with its bank to retrieve latest mortgage deals for its different types of customers (property development companies and individuals).

University of Sunderland

Task 2

Sequence diagrams (15%)

Generate the following UML design diagrams to present the system components and the interaction of those components within the system and with the users.

1. Draw sequence diagrams to show the sequence of interactions for the following:
    a. The interaction of a member of staff with the system to retrieve members details.
    b. The interaction of a customer with the system to update its own record.
    c. The interaction of the system with the bank to retrieve the latest mortgage deals

Class Diagram (15%)

Design a class diagram detailing all the required classes for the completed software prototype. Each class should show the attributes and methods including the appropriate types for different data and methods. Also, the diagram should show correct information on cardinalities between classes and labels for the relations between classes.

Task 3

Report (55%)

Write a report of approximately 1500 words to cover the following aspects of your work:

- Critically assess and justify appropriate software engineering lifecycles and development methodologies for the design, implementation, and evaluation of software. Format and present and content of the report using clear sections, heading, subheading, font style, font size etc. Use formal academic writing style. Avoid using informal terms/phrases. Make use of Harvard referencing style to reference any sources you have used to inform your design decision.

University of Sunderland

Marking Scheme

Tasks	Up to 100%	90%	80%	70%	60%	50%	40%	<40%	<30%
System architecture (15%)	Perfect proposal of suitable architecture which is very appropriate for the problem	Excellent proposal of suitable architecture which is very appropriate for the problem but may lack minor details.	Comprehensive and detailed architecture which is quite appropriate for the problem.	Very good and detailed architecture which is appropriate for the problem but might contain minor issues.	Good attempt and detailed architecture which is very appropriate for the problem.	Good but some architecture which is appropriate for the problem confusion but contains some missing details or lacking clarity	Satisfactory architecture. Several confusions shown, many incomplete parts and lack of understanding of many areas.	Major confusion shown, incomplete architecture and lack of understanding of system architecture	You have not submitted this part of the assessment. incorrect information or missing too many details.
Sequence diagrams (15%)	Perfect sequence diagrams designed to perfect level of detail and professionally presented. No errors or deficiencies. Clearly presented information	Excellent sequence diagrams designed to an excellent level of detail and professionally presented. All the details are identified, and diagrams formatted correctly.	Comprehensive and detailed sequence diagrams, but they may lack very minor details in some cases. Or prefect diagrams are present but missing minor details.	Very good and detailed sequence diagrams, but they may lack some detail or minor mistakes are present.	Good attempt and detailed sequence diagrams presented, may lack many details.	Good diagram but some confusion, few incomplete sequence diagrams, evidence of lack of understanding of some areas of the detailed UML diagram. Issue with following correct notations.	Satisfactory sequence diagrams. Several confusions shown, many incomplete diagrams and lack of understanding of many areas. Issue with following correct notations.	Major confusion shown, incomplete sequence diagrams and lack of understanding of almost all areas of the diagrams. Issue with following correct notations.	You have not submitted this part of the assessment. incorrect information or missing too many details.
Class diagrams (15%)	Perfect class diagrams designed to perfect level of detail and professionally presented. No errors or deficiencies. Clearly presented information	Excellent class diagrams designed to an excellent level of detail and professionally presented. All the details are identified, and diagrams formatted correctly.	Comprehensive and detailed class diagrams, but they may lack very minor details in some cases. Or prefect diagrams are present but missing minor details.	Very good and detailed class diagrams, but they may lack some detail or minor mistakes are present.	Good attempt and detailed class diagram presented may lack many details.	Good diagram but some confusion, few incomplete class diagrams, evidence of lack of understanding of some areas of the detailed UML diagram. Issue with following correct notations.	Satisfactory diagram. Several confusions shown, many incomplete class diagrams and lack of understanding of many areas. Issue with following correct notations.	Major confusion shown, incomplete class diagrams and lack of understanding of almost all areas of the diagrams. Issue with following correct notations.	You have not submitted this part of the assessment. incorrect information or missing too many details.
Report on Methodolo	Perfect discussion	Excellent discussion of	Comprehensive and	Very good and detailed	Good details of discussion	Good but some	Satisfactory but some	Major confusion	You have not

University of Sunderland

gy (45%)	of the proposed methodology including perfect critical analyses and using literature sources to support arguments in many areas.	the proposed methodology including perfect critical analyses and using some literature sources to support arguments in many areas.	detailed discussion of the methodology with good critical analyses and some use of literature sources to support arguments.	discussion of the proposed methodology with satisfactory critical analyses and used a few literature sources to support arguments.	of methodology but lacks some important details, may contain weak critical analyses.	confusion shown, or incomplete discussion of the proposed methodology and shows good understanding of some areas of the problem.	confusions shown, incomplete discussion with minimal critical analyses of some areas of the methodology.	shown, incomplete discussion and lack of understanding of almost all areas of the domain.	submitted this part of the assessment. incorrect information or missing too many details.
Presentation of information, and quality of writing (10%)	Prefect report presentation with very high-quality writing style.	Comprehensive report presentation with very high-quality writing style.	Very Good report presentation with very high-quality writing style.	Very good report presentation with very good quality writing style but minor typos are evidenced.	Good report presentation with good quality writing style.	Good report presentation with good quality writing style but some minor issues such as typos and grammar mistakes are presented.	Satisfactory report presentation with satisfactory quality writing style where some typos, gramme mistakes, or disconnected arguments are presented.	Poor overall report presentation with poor quality writing style.	You have not submitted this part of the assessment. incorrect information or missing too many details.