School of Information Technology

IT1125 / IT1225 / IT1525 / IT1825 / IT1925
Web Development Project

Project Guidebook
AY2025 S2

1. Introduction

1.1 Aims

This module provides students with the practical experience of applying the concepts of object-oriented programming to develop software components that are not only maintainable and extensible but also aligned with sustainability principles. Students shall work in teams to develop, test and implement innovative and interactive applications aimed at solving real life problems that combine Design Thinking Methodology and Agile Processes.

1.2 Learning Outcome

At the end of this module, students will be able to:

- Explain and apply the concepts of classes, encapsulation, inheritance, and polymorphism in object-oriented programming in software development, with a focus on creating robust solutions.

- Apply the key concepts of object-oriented programming to construct maintainable, extensible, and scalable software applications.

- Apply design thinking approaches to create innovative and human-centric applications that effectively address user needs and requirements.

- Plan and execute a project as a team iteratively and deliver the solutions in a timely manner according to the given requirements, following established software development practices.

2. Project Scenario

2.1 Background

Bridging Intergenerational Interaction in Singapore

In Singapore's fast-paced society, interaction between youth and seniors has become increasingly limited. Many young people are focused on school or work, while seniors may feel disconnected from younger generations due to differences in communication styles, technology use, and social interests. Initiatives such as Youth Corps Singapore's intergenerational programs, Lions Befrienders' digital buddy schemes, and school community service projects have shown positive impact — but these efforts are often short-term and in-person, leaving gaps for continuous connection after events end. With the rise of digital communication, there is a unique opportunity to use web technology to create a sustained digital bridge between generations — one that promotes understanding, storytelling, and mutual learning in a fun, meaningful way.

2.2 Problem Statement

Intergenerational connections in Singapore are weakening due to a lack of sustained, meaningful interaction between youth and seniors. This contributes to loneliness among seniors and reduced empathy and cultural understanding among younger generations.

How might we design a web-based platform that encourages ongoing, meaningful interactions between seniors and youth — through shared experiences, digital storytelling, or collaborative activities — in a way that is accessible, enjoyable, and sustainable?

2.3 Project Requirements

To design the web application with a focus on meeting the needs of the target users. Innovation and thinking beyond existing services are encouraged to create a unique and valuable user experience. Each project team to consist of **4 to 5 students**. Each student is responsible for developing at least one feature. Each feature must include core functions (create, retrieve, update, delete (CRUD) operations).

Each team can come up with the basic features such as, but not limited to:

- Story/Memory Sharing Management

- Activity/Event Management

- Messaging/Communication Management

- Profile Management (Youth/Senior)

- Community/Group Management

2.4 Minimum Feature Requirements

- Must fulfil the requirements set by each problem statement and the supporting core functions.

- Must utilise Python classes and objects in the web application.

- Must utilise Python Flask and Jinja2 frameworks.

- Must utilise SQLite or other forms of storage (e.g. MySQL) for implementing persistent storage for Python objects.

- Data validation to ensure data consistency must be performed.

2.5 Additional Features (where applicable)

- Requirements that are mentioned in the problem statements that fall under the following features are considered additional features:

    - Chatbot for customers to interact with.

    - Notifications that will update in real-time.

    - Exporting report in various Excel format.

    - Uploading function using Excel as template.

    - Real-time search and filter in listing records.

    - Map integration with location-based services or route planning.

    - Integration with third-party APIs or libraries.

    - Cloud hosting of web application.

- The features listed above are not exhaustive; additional recommended features can be considered to further enhance the solution.

2.6 Tools and Technologies

The application framework for this project shall utilise Flask for building web applications with

Python. Where appropriate, you may utilise additional development tools, such as Bootstrap, to further enhance the functionality of your project. Teams following predefined problem statements should adhere to any specific technology requirements outlined in their chosen problem statement.

2.7 Project Timeline & Deliverables

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Week	Deliverables	Graded	Notes
1	Form project teams		Teams of 4 to 5 students
2	Project problem statement release		Ask questions to clarify requirements and take notes for planning your Features
7	Problem statement clarification		Students can post questions on Slido, for clarification of problem statement (week7 ~ week10)
9	Proposal presentation	20%	First project assessment
13	Problem statement clarification		Friday (16 Jan 2026) F2F session at LTL3 with DELL
15	Technical Review	20%	Second project assessment
18	• Final presentation • Outstanding presentation done by each diploma selected teams to school judging panel	40%	• Final project assessment • Outstanding presentation candidates nominated by UL/Tutors
19	• Outstanding presentation to DELL judging panel (27 Feb 2026)		• Outstanding presentation candidates nominated by school judging panel • The winner will represent school to participant in Dell InnovateFest 2026 competition

3. Project Assessment

Project comprises 80% of the total module mark.

3.1 Assessment Components

Week	Deliverables	Individual	Group	Total
9	Proposal Presentation			20%
	- Innovation		5%	
	- Proposal		5%	
	- Presentation	5%		
	- Prototype	5%		
15	Progress Review			20%
	- User Interface Usability		5%	
	- Flask Application	5%		
	- Technical & Functionality	5%		

	- Field Validations	5%		
18	Personal Portfolio Submissions			40%
	- Resume and Cover Letter	5%		
	- Digital Portfolio	5%		
	Final Presentation			
	- Integration		5%	
	- Final Solution	15%		
	- LinkedIn Sharing	5%		
	- Presentation	5%		
		60%	20%	80%

3.2 Assessment Rubrics

Week 9 Proposal Presentation (20%)

Group (10 Marks)					
Category	Inadequate (F)	Acceptable (D)	Satisfactory (C)	Very Good (B)	Excellent (A)
Innovation Base Score: 5 Marks	0-1 business needs with little analysis, description, and relevant key facts of the business needs that require digital innovation by the company/industry. 0 to <2.5	1-2 business needs that require digital innovation by the company/industry, each with some detailed analysis, description, and relevant key facts. 2.5 to <3	2-3 business needs that require digital innovation by the company/industry, each with some detailed analysis, description, and relevant key facts. 3 to <3.5	3-4 business needs that require digital innovation by the company/industry, each with detailed analysis, description, and relevant key facts. 3.5 to <4	At least 4 business needs that require digital innovation by the company/industry, each with detailed analysis, description, and relevant key facts. 4 to 5
Proposal Base Score: 5 Marks	Proposed functionality exhibits little empathy for user and incorporated workflow that requires more than 5 improvements before it can value add to business needs. 0 to <2.5	Proposed functionality exhibits low level of empathy for user and incorporated workflow that requires 4 to 5 improvements before it can value add to business needs. 2.5 to <3	Proposed functionality exhibits good empathy for user and incorporated mostly feasible, realistic workflows that requires up to 3 improvements before it can value add to business needs. 3 to <3.5	Proposed functionality exhibits good empathy for user and incorporated mostly feasible, realistic workflows that adds good value to business needs with minimal improvements needed. 3.5 to <4	Proposed functionality exhibits high level of empathy for user and incorporated feasible, realistic, and practical workflow that value add to business needs. 4 to 5

Individual (10 Marks)					
Category	Inadequate	Acceptable	Satisfactory	Very Good	Excellent

	(F)	(D)	(C)	(B)	(A)
Presentation Base Score: 5 Marks	Presenter speaks with monotone; rarely in complete sentences and not easy to understand and follow; Presenter rarely maintains eye contact throughout the presentation.	Presenter speaks with adequate articulation, voice projection and confidence; Presenter occasionally maintains eye contact throughout the presentation.	Presenter speaks with strong articulation, voice projection and confidence; Presenter maintains eye contact most of the time throughout the presentation.	Presenter speaks with excellent articulation/volume and confidence; Presenter maintains eye contact throughout most of the presentation.	Presenter speaks with excellent articulation/volume and confidence; Presenter maintains eye contact throughout the presentation and demonstrates exceptional engagement with audience.
	0 to <2.5	2.5 to <3	3 to <3.5	3.5 to <4	4 to 5
Prototype Base Score: 5 Marks	Wireframe design with limited details and little to no validation messages that requires more than 5 improvements in meeting user needs.	Wireframe design with details and validation messages that requires 3 to 5 improvements in meeting user needs.	Wireframe design with details and validation messages that requires up to 2 improvements in meeting user needs.	Wireframe design with complete details and validation messages that fully meets user needs with minor enhancements.	Wireframe design with comprehensive details, complete validation messages, and exceptional user experience considerations in meeting user needs.
	0 to <2.5	2.5 to <3	3 to <3.5	3.5 to <4	4 to 5

Week 15 Technical Review (20%)

Group (5 Marks)					
Category	Inadequate (F)	Acceptable (D)	Satisfactory (C)	Very Good (B)	Excellent (A)

User Interface Usability Base Score: 5 Marks	Use of bootstrap to create a UI with basic layout, navigation and fonts, and has minimal human-centric design and usability with significant inconsistencies.	Use of bootstrap from practical to create a UI with basic layout, navigation and fonts, and has minimal human-centric design and usability.	Use of bootstrap to create a UI with adequate consistency in layout, navigation and fonts, and has good human-centric design and usability.	Use of bootstrap to create a UI with a good consistency in layout, navigation and fonts, and has very good human-centric design and usability with responsive UI.	Use of bootstrap to create a UI with excellent consistency in layout, navigation and fonts, and has high human-centric design and usability with responsive UI.
	0 to <2.5	2.5 to <3	3 to <3.5	3.5 to <4	4 to 5

Individual (15 Marks)					
Category	Inadequate (F)	Acceptable (D)	Satisfactory (C)	Very Good (B)	Excellent (A)
Flask Application Base Score: 5 Marks	Completed less than 1 complete function (C, R, U or D) with significant errors that prevent proper operations. 0 to <2.5	Completed 1 function (C, R, U or D) with at least 2 fields and no errors. 2.5 to <3	Completed 2 functions (C, R, U and/or D) with at least 2 fields for each function and no errors. 3 to <3.5	Completed 3 functions (C, R, U and/or D) with at least 2 fields for each function and no errors. 3.5 to <4	Completed 4 or more functions (C, R, U and/or D) with at least 2 fields for each function and no errors. 4 to 5
Field Validations Base Score: 5 Marks	Basic validation rules implemented with minimal validation messages and limited coverage of fields.	Basic coverage of validation rules ensures data submitted by users is in the correct format for some fields and with minimal validation messages in meeting user needs.	Adequate coverage of validation rules ensures data submitted by users is in the correct format for most fields and with adequate validation messages to meet user needs.	Good coverage of validation rules ensures data submitted by users is in the correct format for most fields and with good validation messages to meet user needs.	Extensive coverage of validation rules ensures data submitted by users is in the correct format for all fields and with excellent validation messages to meet user needs.

	0 to <2.5	2.5 to <3	3 to <3.5	3.5 to <4	4 to 5
Technical and Functionality Base Score: 5 Marks	Basic implementation of input field types with limited consideration for business and user needs.	Basic use of relevant input field types across some fields to make the functionalities that meet the minimum needs of the business and the users.	Adequate use of relevant input field types across most fields to make the functionalities that meet the needs of the business and the users.	Good use of relevant input field types across most fields to make the functionalities effective in meeting the needs of the business and the users.	Excellent use of relevant input field types across all fields to make the functionalities easy and effective in meeting the needs of the business and the users.
	0 to <2.5	2.5 to <3	3 to <3.5	3.5 to <4	4 to 5

Week 18 Personal Portfolio Submission (10%)

Individual (10 Marks)					
Category	Inadequate (F)	Acceptable (D)	Satisfactory (C)	Very Good (B)	Excellent (A)
Resume and Cover Letter Base Score: 5 Marks	Resume is missing multiple sections that are essential. Resume appears cluttered and messy. Cover letter fails to highlight suitability.	Resume is missing 2 essential sections. Resume is formatted in an acceptable manner, but there are multiple inconsistencies. Cover letter mentions suitability but needs further elaboration.	Resume is missing 1 essential section. Resume is formatted in a neat manner but has a few inconsistencies. Cover letter mentions suitability but could be improved with elaboration.	Resume includes the essential sections. Resume is formatted in a neat manner. Cover letter highlights suitability.	Resume includes all essential sections. Resume is formatted in a professional and neat manner. Cover letter is well written, highlights strengths and suitability.

	0 to <2.5	2.5 to <3	3 to <3.5	3 to <3.5	4 to 5
Digital Portfolio Base Score: 5 Marks	Information provided on project sample is unclear and lacked any explanation.	Information provided on project sample is somewhat unclear and needs further explanation.	Information provided on project sample shows attempt at explanation.	Information provided on project sample is clear and generally supported with explanation.	Information provided on project sample is clear and well supported with explanation.
	No use of visuals, graphics and videos.	Very little use of visuals, graphics and videos.	Some use of visuals, graphics and videos.	Good use of visuals, graphics and videos.	Excellent use of visuals, graphics and videos.
	0 to <2.5	2.5 to <3	3 to <3.5	3 to <3.5	4 to 5

Week 18 Final Presentation (30%)

Group (5 Marks)					
Category	Inadequate (F)	Acceptable (D)	Satisfactory (C)	Very Good (B)	Excellent (A)
Integration Base Score: 5 Marks	Solution is poorly integrated with significant errors throughout and/or requires 3 or more members' solutions to run separately on different workstations	Solution is not fully integrated, runs with 6 or less errors and/or requires 2 members' solution to run separately on another workstation.	Solution is not fully integrated, runs with 4 or less errors and/or requires 1 member's solution to run separately on another workstation.	All members' solutions are fully integrated, and solution runs with 2 or less errors.	All members' solutions are fully integrated with no errors.
	0 to <2.5	2.5 to <3	3 to <3.5	3.5 to <4	4 to 5

Individual (25 Marks)

Category	Inadequate (F)	Acceptable (D)	Satisfactory (C)	Very Good (B)	Excellent (A)
Final Solution Base Score: 15 Marks	Basic solution with minimal or no additional features that shows limited understanding of user needs and business requirements. 0 to <5	Average solution with additional features implemented that exhibits little empathy for user and incorporated workflow that requires extensive enhancement before it can value add to business needs. 5 to <6	Good solution with additional features implemented that exhibits adequate empathy for user and incorporated somewhat feasible, realistic, and practical workflow that required substantial enhancement before it can value add to business needs. 6 to <7	Very good solution with additional features implemented that exhibits good empathy for user and incorporated mostly feasible, realistic and practical workflow that required minimum enhancement before it can value add to business needs. 7 to <8	Excellent solution with additional features implemented that exhibits high level of empathy for user and incorporated completely feasible, realistic, and practical workflow that adds significant value to business needs. 8 to 10
	Demonstration lacks proper structure, session management, and test data, making it difficult to follow the workflow. 0 to <2.5	Poorly structured demonstration of solution without session and little to no test data setup for demonstration of workflow between processes. 2.5 to <3	Adequately structured demonstration of solution with session and basic test data setup for demonstration of workflow between processes. 3 to <3.5	Well-structured demonstration of solution with session and some test data setup for smooth demonstration of workflow among processes. 3.5 to <4	Excellently structured demonstration of solution with session and relevant test data setup for smooth and neat demonstration of workflow among processes. 4 to 5
LinkedIn Sharing Base Score: 5 Marks	Unclear or incomplete description of the project's objectives with no highlighting of key features and no mention	Limited description of the project's objectives, little highlights of key features, and minimal outlining of benefits and	Adequate description of the project's objectives, highlighting some key features, and outlining	Well-defined description of the project's objectives, highlighting most key features, and outlining several	Clear and concise description of the project's objectives, extensively highlighting key features, and

	of benefits or positive impacts.	positive impacts of the solution.	few benefits and positive impacts of the solution.	benefits and positive impacts of the solution.	outlining all the benefits and positive impacts of the solution.
	0 to <2.5	2.5 to <3	3 to <3.5	3.5 to <4	4 to 5
Presentation Base Score: 5 Marks	Presenter speaks with monotone; rarely in complete sentences and not easy to understand and follow; Presenter rarely maintains eye contact throughout the presentation.	Presenter speaks with adequate articulation, voice projection and confidence; Presenter occasionally maintains eye contact throughout the presentation.	Presenter speaks with strong articulation, voice projection and confidence; Presenter maintains eye contact most of the time throughout the presentation.	Presenter speaks with excellent articulation/volume and confidence; Presenter maintains eye contact throughout most of the presentation.	Presenter speaks with excellent articulation/volume and confidence; Presenter maintains eye contact throughout the presentation and demonstrates exceptional engagement with audience.
	0 to <2.5	2.5 to <3	3 to <3.5	3.5 to <4	4 to 5

~ End ~