

SCHOOL OF ENGINEERING AND TECHNOLOGY

**ASSIGNMENT FOR THE
BACHELOR OF SOFTWARE ENGINEERING (HONS)
ACADEMIC SESSION SEPTEMBER 2024
SWE3043 SOFTWARE TESTING**

DEADLINE: Week 12, 13 December 2024 (Friday), 5pm via eLearn (by Group Leader)

STUDENT NAME: _____ **(Leader)** **STUDENT ID:** _____

STUDENT NAME: _____ **STUDENT ID:** _____

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INSTRUCTIONS TO CANDIDATES

- This is a group assignment, with FOUR (4) to FIVE (5) members in a group. This assignment will contribute 30% to your final grade. The marking scheme rubric is available on the group assignment descriptions.

IMPORTANT

The University requires students to adhere to submission deadlines for any form of assessment. Penalties are applied in relation to unauthorized late submission of work.

- Coursework submitted after the deadline but within 1 week will be accepted for a maximum mark of 40%.
- Work handed in following the extension of 1 week after the original deadline will be regarded as a non-submission and marked zero.

Lecturer's Remark (Use additional sheet if required)

We (Name) Student ID received
the assignment and read the comments (Signature/date)

Academic Honesty Acknowledgement

"We (students' name) verify that this paper contains entirely our own work. We have not consulted with any outside person or materials other than what was specified (an interviewee, for example) in the assignment or the syllabus requirements. Further, we have not copied or inadvertently copied ideas, sentences, or paragraphs from another student. We realize the penalties (*refer to page 16, 5.5, Appendix 2, page 44 of the student handbook diploma and undergraduate programme*) for any kind of copying or collaboration on any assignment."

..... (Students' signature / Date)

SWE3043 SOFTWARE TESTING

Group Assignment

SLO 2: Determine a suitable test design technique to a work product or software to find defects.

Rubrics:

Items		Excellent (10-8)	Competent (7-5)	Poor (4-0)
Part 1: (16%)	a) Test design (8%)	Correctly demonstrate test techniques to derive and design test cases	Demonstrate test techniques to derive and design test cases with minor errors	Demonstrate test techniques to derive and design test cases with major errors
	b) Test cases (8%)	Well document important test cases with correct requirements and traceable	Well document most of important test cases with correct requirements and traceable	Document test cases with requirement with errors
Part 2: (9%)	a) Essay on reviews (5%)	Document process, explains idea well, clearly connect with testing principle and review activities	Document is coherent for the most part with missing some of the important information associate with testing principle and review activities	Document lacks coherence and missing most of the important information associate with testing principle and review activities
	b) Note on Appendix A (4%)	Well written notes / recommendations to improve the work product quality	Relevant and adequate notes / recommendations to improve the work product quality	Irrelevant and few notes / recommendations to improve the work product quality
Part 3: (5%)	Individual report (5%)	Well demonstrate knowledge of the tester in test design, test case generation and review role accurately	Demonstrate knowledge of the tester in test design, test case generation and review role with sufficient information	Demonstrate knowledge of the tester in test design, test case generation and review role inaccurately

Part 1: Test Design and Case Specification (16%)

A mock software testing project, known as Automated Teller Machine System (ATMS) Independent Verification and Validation Project is given by Malaysia Software Testing Board (MSTB) Lecture Aid.

Two fictional company have been given designated role to this mock software testing project as follow:

- ABC Test-Co: An independent software testing company
- XYZ Bank: The owner of the ATMS software

The ATMS IV&V Project has been designed to have 2 iterations as below:

- Iteration 1: is meant to test one out of eight functions of the test object
- Iteration 2: is meant to test remaining of seven functions of the test object

You are currently one of ABC Test-Co team (four to five members) involving in the Iteration 2. Your team is responsible to produce test design and test case specifications for any **THREE** functions except for F006 Cash Deposit of the seven remaining functions of the test object.

To support your team to produce the test deliverables mentioned above, table below show the details information related to the test process with respective test deliverables to produce, and the location of the document.

Test Process	Test Deliverables	Location of Document
Test Planning & Control	Test Item Transmittal Report Test Plan	MSTB Lecture Aid
Analysis & Design	Test Design Specification Test Case Specification	Blank Template (eLearn) to produce
Implementation	Test Procedure Specification	MSTB Lecture Aid only for Iteration 1
Execution	Test Log Test Incident Report	
Evaluation Exit Criteria & Reporting	Test Summary Report	
Closure	Test Completion Report	
Other work products and test object available:		
Work Product 1	ATMS Software Requirements Specifications	MSTB Lecture Aid
Work Product 2	ATMS Software Design Specifications	
Test Object	ATMS 1.1	eLearn

To complete the test design specification and test case specification, your team need to **select suitable Blackbox test design techniques** to design the test cases. There must be a clear description in preparation of the test design and test cases specifications. For each function:

- Explain how you have used the technique to derive and design the test case
- Ensure traceability to the correct requirement in the requirement specification

Refer to the test design and test case template given in the eLearn or MSTB lecture aid. Your group should use all possible test techniques according to nature of features.

Part 2: Static Testing Techniques – Reviews (9%)

Choose the appropriate review types to review the given work product in **Appendix A**. Produce a review report in a group, if your group encounter any ambiguity in the work product, discuss to make a group decision, then highlight for making a note on the work product in Appendix A using comment tool as YOUR GROUP review decision/recommendation to improve the quality for the specific work product.

Part 2 assignment report, write an essay where you explain reviews as a testing technique by answering or discussing the following questions:

- Report in Group (2000 -3000 words), and not limited to:
 - What type of reviews did your group use to increase the quality of work product (Appendix A)?
 - Which testing principle is followed when using reviews in the early stages of the development process?
 - Do you see reviews as useful for the project?
 - What kinds of problems do you think the reviews would locate?
 - What kinds of problems the review might not locate?
 - How did your group implement it?
 - Discuss your team's findings and highlight them in Appendix A.
 - References to support your answers.
- Appendix A with comments of defect or bug, and recommendations to improve the quality of the specific work product.

Part 3: Reflection on your both Roles in Part 1 and Part 2 (5%)

- Individual Report (500 - 800 words for each member)
 - Each group member writes in short paragraph about your role, responsibilities, and experience about this part 1 and part 2 activities.

Submission Details:

Due on week 12: 13 December 2024 (Friday), 5pm

This is a group assignment, with FOUR (4) to FIVE (5) members in a group.

Submit the following items (compile into one document) through eLearn Assignment link by Group Leader only:

- Cover page of the assignment with all member's signature on the cover page.
- Part 1:
 - Test design specification
 - Test case specification
- Part 2:
 - Report on the essay about review activities for the given work product in Appendix A.
 - Decision or note about your group decision on the given work product (Appendix A).
- Part 3:
 - Including each member individual report on their role, responsibilities, and experiences from part 1 and part 2 activities.

NOTE: It is responsibility of each member to ensure there is group submission by group leader.

Group registration- Registration must perform by your group leader ONLY, and submit all members name, and Student ID via MS Team before 22 October 2024 (Tuesday), 5pm.

Appendix A:

A Ticket Machine - System Specification

Development model: The V – model

Requirements:

The ticket machine module:

The traveller shall be informed about

- Payment information
- Ticket prices
- Ticket conditions

The traveller shall be able to buy

- A rechargeable travel card
- A week pass
- A 21-day pass

A traveller with an existing travel card shall be able to

- Recharge the travel card with a self-selected amount of money
- Check the balance of the card

The control module:

A traveller with a rechargeable travel card should be able to

- Register a trip, if the trip has not already been registered within the last hour. When the trip is registered, the system shall reduce the balance of the card with the cost of a trip.
- Get a ticket valid for one hour after registration. It should be possible to make multiple trips within one hour of registration.
- Get information about expiration time.
- Get information about the balance of the card.

All travellers shall be informed about

- Whether the ticket is valid or not
- The ticket expiration date

Both the ticket machine and the control module should be accessible to everyone and the user-friendliness is therefore important. Both modules must be

- Understandable
- Intuitive to use
- Consistent in behaviour and design
- Reliable
- Robust
- Fault tolerant

Ticket prices and discounts:

Ticket prices and discounts will be set in the administration module.

For test purposes you can use the following ticket prices:

Category\Ticket Type	Single trip*	A week pass	A 21-day pass
Children	RM1.50	RM10.00	RM15.00
Students	RM2.50	RM15.50	RM25.00
Adults	RM3.00	RM25.50	RM35.00

*The price for a single trip using a travel card

The discounts only apply to travellers with a travel card.

Day \ Category	Children	Students	Adults
Monday to Friday	0%	0%	0%
Saturday to Sunday	100%	50%	25%
Public holidays	100%	60%	30%

User interaction – The ticket machine

The ticket machine module will be described as the interaction between the user and the system:

State 1: Start window:

The traveller can choose one of two options:

- Buy a ticket or a travel card. The system goes to state 2.
- Recharge an existing travel card. The system goes to state 3.

State 2: Window for choosing the type of ticket or travel card:

The traveller can choose one of three options:

- Travel card. The system goes to state 5.
- A week card. The system goes to state 6.
- 21-days card. The system goes to state 6.

State 3: Window for reading a travel card.

The traveller holds the travel card in front of the card reader so that the card is read. If the system is recognizing the card, the system goes to state 5. If the system does not recognize it or the card, for any reason, is not valid, the system goes to state 4.

State 4: Window for displaying an error message.

The system displays the error message “Unknown card” on the screen.
After a few seconds, the system goes back to the start window, state 1.

State 5: Window for making deposits to the travel card

The traveller enters the amount he/she wants to deposit to the card.
The system goes to state 6.

State 6: Confirmation window.

Information about what is purchased and what is payable is displayed on the screen. The traveller can choose one of two options:

- The traveller confirms the purchase, by pressing the confirm button. The system goes then to state 7.
- Cancel: The traveller cancels the transaction by pushing the cancel button. The system goes the back to the start screen, state 1.

State 7: Payment window:

The following message is displayed on the screen: “Insert you credit card”.

Although not mentioned in the description above, all windows will have a cancel button.

User interaction – The control module

The control module will be described as the interaction between the user and the system. Travelers with a week or 21-day pass does not need to register the trip. However, the control module can be used to display expiration time.

State 1: Window for reading a ticket or a travel card.

The traveller holds the ticket or the travel card in front of the card reader so that it is read. If the system is recognizing the ticket or the travel card, the system goes to state 2. If the system, for any reason, does not recognize the ticket or the travel card, the system goes to state 5.

State 2: The system checks the expiration time:

For 7-day or 21-day pass: If the time is before the expiration date, the system goes to state 4. If not, the system goes to state 5.

For travel cards: If it is less than one hour since the last registration, the system goes to state 4. If there is one hour or more than one hour since the last registration, the system goes to state 3.

State 3: The system checks the balance of the travel card.

If the balance is above or equal the cost of the trip, the balance will be reduced by the cost for the trip. The system then goes to state 4.

If the balance is below the cost of the trip, the system goes to state 5.

State 4: Information window.

The system will show information about expiration time for both tickets and travel cards.

For traveling cards, the cost of the trip and the balance of the card will also be displayed.

After a few seconds, the system goes back to state 1.

State 5: Error message window.

The system displays an error message on the screen with the following message: “The card or ticket is not valid. You must pay before entering”.

After a few seconds, the system goes back to state 1.