

# UNIVERSITI TEKNOLOGI MARA

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| **COURSE** | **:** | **INTRODUCTION TO ALGORITHM DESIGN AND DEVELOPMENT** |
| **COURSE CODE** | **:** | **CSC121** |
| **ASSESSMENT** | **:** | **GROUP PROJECT**  **(PROJECT REPORT - 25% AND PRESENTATION – 10%)** |
| **TOTAL MARKS** | **:** | **35%** |

**OBJECTIVE:**

This assessment aims to demonstrate students’ good value and ethical practices in problem-solving solutions and algorithm developments. Students are required to work in a team to identify a simple real-world problem and design an effective and logical algorithm representation for the problem. Students are expected to be able to select suitable programming control structures (sequential, selection, repetitions) and modules/functions and apply them in algorithms design. Aside from problem solving skills, this project is essential to value students’ communication skills, leadership ability, teamwork, and other soft skills during project presentation.

# OUTCOMES (PLO2 11, A3):

Students should be able to apply professionalism and team values in completing tasks related to problem-solving solutions and algorithm developments.

# INSTRUCTIONS:

Automation has become a crucial aspect of modern technology, enhancing efficiency and reducing human effort across various industries. Automated systems streamline processes, minimize errors, and improve overall productivity in businesses and daily activities.

In a group of **3 – 4 members**, students are expected to propose an **automated system** that can improve a specific task or process. Examples such as such as **food ordering system, ticket reservation system, hotel reservation system**, **automated attendance tracking system**, **smart inventory management system**, **queue management system**, or any other innovative automated solution. Students may also propose enhancements to existing manual systems by introducing automation.

This project requires students to submit a **complete proposal report** outlining their project idea and present their solution. The proposed system should include an efficient algorithm represented using **pseudocode and flowchart**, incorporating **selection, repetition structures, and functions/modules**. Please refer to the **scoring rubrics** for detailed marking criteria for the proposal report and presentation.

# PROJECT GUIDELINES:

# Project Report (25%)

* 1. Prepare a complete report which consists of:
     + Cover page (students’ information and project name)
     + Table of contents
     + Introduction to the problem / project motivation
     + Objective of the project (**not more than 3 objetives**)
     + Problem analysis (input, process, and the expected output)
     + Solution
* Efficient and logical flowchart and pseudocode
* Explain the implemented control structure and method/function
* Provide samples of expected output
  + - Discussion
* Justification for the chosen solution (Why this method?)
* Challenges faced and how they were solved
* Ethical and professional considerations:
  + - Conclusion
* Summarize the overall outcome
* Reflection on Professional and Ethical Practices
* Lessons learnt during the project
* Recommendations or Future Work
  + - References (at least 2 refences; use citation APA Style)
    - Scoring rubrics (report and presentation)
  1. The pseudocode and flowchart **MUST** include:
     + Programming Control Structure (Selection and Repetition)
     + Function/Module
     + At least **THREE** calculations (total amount, discount, number of transactions, etc.)
  2. Format:
     + 15-20 pages including cover and rubrics
     + Heading: Arial Black (Heading); size: 11
     + Font: Arial; size: 11-point; alignment: justify
     + Pseudocode should be neatly typed with indentation
     + Flowchart should be designed using diagramming tools (Eg: Flowgorithm/Lucid Chart/Microsoft Visio etc)
     + Both pseudocode and flowchart must be readable
     + Page Number: Bottom and center of each page
  3. Submission:
     + Rename the report as: Class group\_short team members name (Eg: 1Z\_Mia\_Sara\_Lily)
     + Submit in PDF format only
     + Report submission and presentation date is on Week 14
     + Submit a group assignment in UFuture. **Only team leader to submit.**

# Presentation (10%)

# 10 - 15 minutes group presentation. The presentation slide should be creative and should consist of:

* Introduction to the student’s group and problem
* Objective of the Project
* Analysis – Input/Process/Output
* Algorithm representation – Flowchart and Pseudocode
* Discussion and conclusion

# SCORING RUBRICS (REPORT) – 68 MARKS

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Attributes** | **Sub-attribute** | **No Submission** | **Poor (1)** | **Fair (2)** | **Good (3)** | **Excellent (4)** | **Weight** | **Score** | **Marks** |
| Algorithm Design and Development | Pseudocode Readability | No Submission | Poor use of white space, disorganized, poor variable/control structure use. | Fairly readable, partially organized, basic use of control structures. | Good readability and organization, appropriate use of control structures. | Excellent readability, very well organized, excellent use of structures. | 2 |  |  |
| Flowchart Readability | No Submission | Poorly organized and hard to follow, shapes wrongly used. | Readable with some effort, some incorrect shapes. | Fairly easy to read, mostly correct shapes. | Exceptionally clear, well-organized, correct shapes. | 2 |  |  |
| Algorithm Efficiency | No Submission | Chose an inappropriate or incorrect approach with no justification. Lacks clarity in user interaction and shows no consideration for ethical or professional standards. | Attempted a solution with limited justification and some effort toward user clarity.  Ethical or professional aspects minimally considered. | Selected a reasonable and justified approach.  Demonstrated responsible decision-making and user-focused design. Shows good awareness of ethical and professional practices. | Selected and justified the most suitable approach. Demonstrates excellent ethical reasoning and professional conduct in solution design, including clear, user-friendly output and responsible handling of alternative options. | 4 |  |  |
| Problem Solving Skills | No Submission | Execution errors, misleading prompts, no testing. | Some execution issues, basic prompts, partial testing. | Correct execution, understandable prompts, appropriate testing. | Correct and optimized execution, clear prompts, comprehensive testing. | 3 |  |  |
| Documentation/Project Report | Background, Problem Statement & Objectives | No Submission | Unclear problem, objectives not stated or weak rationale. | Adequate problem and objectives with basic rationale. | Clear context, problem and objectives stated good rationale. | Exceptionally clear and strong problem statement, well-defined objectives and rationale. | 1 |  |  |
| Depth of Knowledge | No Submission | Limited understanding, vague or incorrect explanation | Some understanding: explanation has gaps | Good understanding with mostly clear explanation | Deep understanding, confident and insightful explanation of algorithm | 1 |  |  |
| Discussion & Conclusion | No Submission | Unrelated or weak discussion. | Basic but relevant discussion. | Logical and relevant discussion. | Well thought-out and strong conclusion. | 2 |  |  |
| Formatting & References | No formatting | Unorganized, major grammar issues, no references. | Basic formatting, some grammar/references. | Good formatting, appropriate references. | Excellent formatting, grammar, and reference quality. | 2 |  |  |
|  |  |  |  |  |  | **TOTAL** | | |  |

# SCORING RUBRICS (PRESENTATION) – 32 MARKS

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Attributes** | **Sub-attribute** | **No Submission (0)** | **Poor (1)** | **Fair (2)** | **Good (3)** | **Excellent (4)** | **Weight** | **Score** | **Marks** |
| Presentation | Slide clarity & visual appeal | No Presentation | Slides disorganized, unreadable, poor visuals | Some slides are readable; visuals are limited or inconsistent | Clear slides with mostly appropriate visuals | Highly readable, well-designed slides with consistent and appealing visuals | 2 |  |  |
| Delivery & Communication | No Presentation | Three or more of the presenters didn't know the information and got lost often.  The presenter does not speak clearly and may not be audible to most of the audience. Persistent grammatical errors and serious mispronunciation. Very poor eye contact. | Two of the presenters didn't know the information and got lost often.  The presenter speaks relatively clear but may not be audible to the back audience. Some grammatical errors and some mispronunciation. Some eye contact. | One presenter didn't know the information and they got lost often.  The presenter speaks clearly and is audible to most of the audience. Relatively few grammatical errors and pronunciation is good. Good eye contact. | All presenters knew the information and progressed smoothly through the presentation.  Grammatical errors are insignificant and pronunciation is very good. Excellent eye contact. | 2 |  |  |
| Ethics & Professionalism | Work Responsibility | Does not perform assigned tasks within the scope of work even with close supervision | Perform assigned tasks within the scope of work with close supervision | Perform assigned tasks within the scope of work and meet expectations | Perform assigned tasks within the scope of work and exceeds expectations | Perform assigned tasks beyond the scope of work and beyond expectations | 2 |  |  |
| Teamwork | Has a disharmonious relationship with co-workers and within institution, work, groups and community when at work | Has a less harmonious relationship with co-workers and within institution, work, groups and community when at work | Has a satisfactory relationship with co-workers and within institution, work, groups and community when at work | Has a good relationship with co-workers and within institution, work, groups and community when at work | Has a well-acknowledged relationship with co-workers and within institution, work, groups and community when at work | 2 |  |  |
|  |  |  |  |  |  | **TOTAL** | | |  |