



| **COURSE** | **:** | **INTRODUCTION TO ALGORITHM DESIGN AND DEVELOPMENT** |
| --- | --- | --- |
| **COURSE CODE** | **:** | **CSC121** |
| **ASSESSMENT** | **:** | **PRACTICAL TEST** |
| **NAME** | **:** |  |
| **MATRIC NO** | **:** |  |
| **GROUP** | **:** |  |

### This assessment is designed to attain the followings:

* **Course Learning Outcome:** CLO2

*Display practical skills in algorithm design and developments for different types of programming control structures.*

* **Program Learning Outcome:** PLO3

*Thinking and scientific skills.*

**Instructions:**

1. This is an individual assignment.
2. Time given for this assignment is 2 hours.
3. You must solve programming the problem using algorithm representation using pseudocode and flowchart.
4. Pseudocode should be written neatly with indentation.
5. Flowchart should be drawn using the correct symbols.
6. For any intention of plagiarism or any misconduct of this assignment, the student will be penalized according to the rules, and a zero mark will be awarded due to the action.

**SCENARIO:**

You are developing a **Currency Exchange Program** for a **money exchange company**. The company allows customers to exchange **Malaysian Ringgit (MYR)** to foreign currencies and vice versa. The program should calculate the **final amount** a customer will receive after applying the appropriate exchange rates and taxes.

**Exchange Rates:**

The following tables show the exchange rates for converting between **MYR** and **foreign currencies**:

Table 1: Exchange Rates for converting Foreign Currencies to MYR (Tax Applied After Conversion)

| **From Currency** | **To MYR** | **Exchange Rate** |
| --- | --- | --- |
| USD | MYR | 1 USD = 4.35 MYR |
| EUR | MYR | 1 EUR = 4.80 MYR |
| JPY | MYR | 1 JPY = 0.037 MYR |

Table 2: Exchange Rates for Converting MYR to Foreign Currencies (Tax Applied Before Conversion)

| **From MYR** | **To Currency** | **Exchange Rate** |
| --- | --- | --- |
| MYR | USD | 1 MYR = 0.23 USD |
| MYR | EUR | 1 MYR = 0.21 EUR |

**Tax Structure:**

The tax structure is different for conversions in each direction.

* **For MYR to foreign currency conversion**, tax is imposed **before** converting MYR into another currency.
* **For foreign currency to MYR conversion**, tax is imposed **after** the conversion from foreign currency to MYR.

Table 3: Applicable tax for MYR to Foreign Currency Conversion (Tax Applied Before Conversion)

| **Conversion Type** | **Service Tax** | **Government Tax** |
| --- | --- | --- |
| MYR to Foreign Currency (< MYR 10,000) | 1.5% | - |
| MYR to Foreign Currency (>= MYR 10,000) | 1.5% | 2.5% |

Table 4: Applicable tax for Foreign Currency to MYR Conversion (Tax Applied After Conversion)

| **Conversion Type** | **Service Tax** | **Government Tax** |
| --- | --- | --- |
| Foreign Currency to MYR | 5% | - |

**Your program should include the following:**

* **Welcome Message**: Greet the user and explain the purpose of the program.
* **Conversion Type**: Ask the user whether they are converting from MYR to a foreign currency or from a foreign currency to MYR.
* **From MYR to foreign currency**: Ask user to select currency to be converted
* **From foreign currency to MYR Currency**: Ask user to select the source currency to be converted to MYR
* **Amount to Convert**: The amount that the user is converting

**The program should display the following information to the user:**

* **Amount to Convert**: The amount that the user is converting.
* **Exchange Rate**: The exchange rate used for the conversion.
* **Tax Applied**: The service and government tax applied based on the conversion type and amount.
* **Converted amount**: The converted amount for foreign currency to MYR only
* **Final Amount**: The amount the user will receive after applying the taxes.



**Sample of expected output:**

Here is a sample of the expected output for your reference when designing your algorithm. (Not mandatory to follow this sample exactly)







**TASK:**

Based on the description above, please complete the following task.

1. **Write a complete pseudocode** for the program using sequential and selection control structures only. Ensure your pseudocode handles both conversion types and includes tax calculations as described.
2. **Draw the corresponding flowchart** for the pseudocode in Task 1. Use the correct symbols to represent processes, decisions, and inputs/outputs.
3. State the type of selection control structure used in your pseudocode and flowchart
4. Given the input below, calculate the output for service tax, government tax, converted amount and amount to be received. Refer exchange rate provided in Table 1 and Table 2.

**Conversion type: USD 999 to MYR**

Converted amount (RM) : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Service tax (RM) : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Government tax (RM) : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Total tax (RM) : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Amount to be received (MYR): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**SCORING RUBRIC**

| **Attributes** | **No Submission (0)** | **Poor (1)** | **Fair (2)** | **Good (3)** | **Excellent (4)** | **Weight** | **Marks** | **Score** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Problem Understanding** | No understanding of the fundamental aspects of the problem | Minimal understanding: algorithm does not address the problem or constraints. | Partial understanding; significant errors in problem interpretation. | Demonstrates good understanding; minor misinterpretations. | Demonstrates complete understanding of the problem. Algorithm aligns perfectly with requirements and constraints. | 2 |  |  |
| **Pseudocode Design** | No pseudocode submitted | Disorganized, unclear, missing key components. | Somewhat clear; follows conventions but errors in structure or logic. | Mostly clear and organized; minor inefficiencies or errors. | Exceptionally clear, concise, and follows proper conventions; organized and efficient. | 3 |  |  |
| **Flowchart Representation** | No flowchart submitted | Poorly organized, difficult to follow, and uses incorrect symbols. | Flowchart is somewhat clear but contains errors or ambiguities in symbols or logic flow. | Flowchart is readable, follows proper conventions, but with minor mistakes. | Flowchart is exceptionally well-organized and easy to follow; all symbols used correctly. | 3 |  |  |
| **Algorithm Logic** | No algorithm logic provided | Algorithm does not produce the correct output; major errors in logic. | Some errors in logic; produces correct output for limited cases. | Mostly correct logic; handles most scenarios, but minor errors exist. | Fully correct logic; handles all scenarios (normal and edge cases), produces accurate and complete output. | 4 |  |  |
| **Problem Solving Skills** | No attempt to solve the problem | Does not solve the problem or lacks essential logic. | Solves part of the problem but misses optimizations or key control structures. | Solves the problem with some minor inefficiencies or missing optimizations. | Solves the problem efficiently with appropriate control structures and optimizations. | 3.5 |  |  |
| **User-Friendliness** | No prompts provided | Prompts and outputs are unclear, difficult to follow. | Prompts and outputs are understandable but lack clarity or formatting. | Prompts and outputs are clear with minor formatting issues. | Prompts and outputs are highly intuitive, clear, and well-formatted, enhancing readability and usability. | 2 |  |  |
|  |  |  |  |  |  |  | Total |  |