COMP1030 SYSTEMS ARCHITECTURE 2024-2025
ARM Assembly Language Programming

Coursework 2: Group Assignment (Marks 70, weightage 20%)

Task 1

a) Write an ARM assembly program to implement the **Breadth First Search Algorithm** for a sorting operation in ascending order over a binary tree having the following **15** values:

(10, 5, 30, 78, 2, 19, 11, 23, 48, 79, 1, 14, 9, 41, 31)

(25 Marks)

b) Prepare a flow chart of the **Breadth First Search Algorithm** and a 1-page report to explain how the assembly language instructions from part (a) perform the major operations of the Breadth First Search algorithm.

(10 Marks)

Task 2

a) Write an ARM assembly for **Merge Sort Algorithm**. for a sorting operation in ascending order over an integer ARRAY having the following ten values:
(8, 29, 50, 81, 4, 23, 24, 30, 1, 7)

(25 Marks)

b) Prepare a flow chart of the **Merge Sort Algorithm** and a 1-page report to explain how the assembly language instructions from part (a) perform the major operations of the Merge Sort Algorithm.

(10 Marks)

Key Dates
Release Date: 1nd November 2024 (Friday)
Submission Deadline: 9th December 2024, Monday @23:59 (GMT+8 Kuala Lumpur)

Deliverables on Moodle
Task 1: ARM program code, and a 2-page report (1 page for flow-chart, 1 page for explanation)
Task 2: ARM program code, and a 2-page report (1 page for flow-chart, 1 page for explanation)

Marking Scheme

- There is a total of two (2) questions, and each question has two parts. Marks allocations are listed at the end of the questions.
- For **part a,** of Tasks 1 and 2: Marks will be awarded according to the (i) programming logic, (ii) program performance, (iii) code optimization, (iv) efficient use of ARM assembly language instructions, and (v) the use of clear comments in the program.
- For **part b,** of Tasks 1 and 2: Marks will be awarded according to the (i) correct diagrammatic representation in the flowchart, and (ii) Clarity and understandability of the explanation.
- Partial marks will be awarded to partially correct/valid answers/explanations.

Note: Late submission will trigger a penalty according to the Quality Manual whereby 5% will be deducted per day. For example, if a submission is late by 1 day and 2 hours, 10% of marks will be deducted.

Use of ChatGPT, Gemini or any other AI tool is strictly prohibited.

Plagiarism is strictly prohibited.