

DEPARTMENT OF COMPUTING & INFORMATICS
CSC 213: Computer Architecture
LAB 1 – The Little Man Computer

Due date: **Friday November 5, 2021**

1 Objective

By the end of this laboratory exercise, you should be able to:

1. demonstrate understanding of the the basic operations of a von Neumann architecture machine
2. program a simple machine using the instruction set provided

2 Background

The Little Man Computer (LMC) is a simulator which models the basic features of a modern computer. It is based on the von Neumann architecture featuring a central processing unit consisting of an arithmetic logic unit and registers, a control unit containing an instruction register and program counter, input and output mechanisms and memory to store both data and instructions.

3 Tasks

Tasks 1 - Access and understand the operations of the LMC

- (a) Download or access the on-line version of the LMC
- (b) Use a tutorial to understand how to use the LMC

Tasks 2 - Investigate the instruction set of the LMC.

- (a) What are the categories of LMC instructions. For each, identify at least specific operations in the category.
- (b) Identify at least three (3) computational tasks that you can perform using LMC (e.g., addition and subtraction, conditional execution using IF and iteration), and perform the tasks.
- (c) Using the LMC instruction set, write a program to divide two numbers to give the quotient and remainder, i.e.,

$$5 \div 3 = 1 \text{ remainder } 2$$

4 Evaluation

In your opinion, did the LMC assist you in understanding the basic concepts of computer architecture? If so, explain the concepts.

5 Submission

Required: Submit the program of **Task 2** (c), and your answer to the evaluation question.