Lab #3
Using Memory

Sections 2 and 3 of this exercise will count towards your final coursework mark for CS1021. Submit your solutions using Blackboard no later than 23:59pm on Monday 27th November 2017.

1 String Length

Assume that a NULL-terminated string of ASCII characters is stored in memory. Design, write and test an ARM Assembly Language program to compute the length (number of characters) in the string, excluding the NULL character. Store the result in `R0`. Use the StringLength project to develop your solution. Verify that your program works by testing it with different strings.

2 String Reversal

Design and write an ARM Assembly Language program to create a new string in memory that is the reverse of an existing string, also stored in memory.

For example, if the original string was "hello", your program should store the string "olleh".

Use the StringReverse project to develop your solution.

3 Unique Values

Design and write an ARM Assembly Language program that will determine whether each word-size value in a list of word-size values in memory is unique (i.e. each value occurs only once in the list). If every value in the list is unique, your program should store the value 1 in R0, otherwise you should store 0 in R0.

For example, given the list below, your program should store a 1 in R0 because each value only occurs once.

5, 2, 7, 4, 13, 30, 18, 8, 9, 12

However, given the list below, your program should store a 0 in R0 because the value 4 occurs twice in the list.

5, 2, 7, 4, 13, 4, 18, 8, 9, 12

Use the Unique project to develop your solution.