



CS1021 Tutorial #7

Using Memory

1 Subset

Assume two mathematical sets, A and B , containing 32-bit values are stored in memory. Working in groups, and beginning with a pseudo-code or Java solution, design and write an ARM Assembly Language program to determine if the set A is a subset of the set B . A and B are stored in memory as unordered sequences of unique word-size values, along with the size of each set, as shown below.

1	ASize	DCD	3		; Number of elements in Set A
2	AElems	DCD	7,20,9		; Elements in Set A
3					
4	Bsize	DCD	8		; Number of elements in Set B
5	Belems	DCD	9,13,7,11,20,25,10,12		; Elements of Set B

If A is a subset of B , your program should store 1 in R0, otherwise, it should store 0.

2 Unique Values

Working in groups, and beginning with a pseudo-code or Java solution, 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 it 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

Assume the list of values is stored in memory as shown below:

1	COUNT	DCD	10
2	VALUES	DCD	5, 2, 7, 4, 13, 4, 18, 8, 9, 12