

School of Science, Computing and Artificial Intelligence
The University of the West Indies, Five Islands



COMP0002 - Lab 3

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Exercise 1

1. How many locations comparison will you need to find that 4 isn't present using:

Location	0	1	2	3	4	5	6	7	8	9
Value	-3	-2	-1	0	1	3	5	7	10	28

- a. In a linear search to find the value "4" which isn't present, it will search every index since lists don't need to be ordered for this search so it will compare items **10** times!
- b. In a binary search for the value "4" which isn't present, it will first go to the middle index [4] and see the value "1" since 4 is larger, we go to the middle of [5-9]. At index [7] we see the value 7, so since 4 is smaller the item must now be at 6, right? So we find the middle of [5-6] and it checks the value at [5] which is 3, so 4 is larger so we check the index at 6, and realize... it doesn't exist in this list. So it compares **4** times.

2. Consider the following array with five integers

Location	0	1	2	3	4
Value	-5	-3	1	7	-7

Use a bubble sort (ascending order) to show the contents of the array for each of the first four passes of the sort. [4 marks]

Location:	0	1	2	3	4
Iteration 1	-5	-3	1	-7	7
Iteration 2	-5	-3	-7	1	7
Iteration 3	-5	-7	-3	1	7
Iteration 4	-7	-5	-3	1	7