Assignment 1 – Run time analysis

Task 0

This involves accessing indexed items in a Python list which is a O(1) operation. Therefore the two actions will be equal to 2 * O(1) which is O(1).

Task 1

This involves sequential access of all items in two Python lists which is 2 * O(n). Therefore the time complexity of this operation is O(n).

Task 2

This involves two list searches that are executed multiple times. The worst case time complexity of Python list search is O(n) where n is the number of items stored in the list. X * O(n) is effectively O(n) when time complexity is expressed.

Task 3

This task includes a number of sequential list access operations which are together X*O(n). It also includes a Python sorting operation which has time complexity of O(n log n). X*O(n) + O(n log n) is effectively O(n log n).

Task 4

When anslysing time complexity, this task is similar to the previous task since the sequential list access together with the sorting operation has time complexity of O(n log n). X*O(n) + O(n log n) is effectively O(n log n).