**CPSC 1160: Week 4 HW**

**Due: As indicated by submission link**

**Total Marks: 10**

**Instructions – PLEASE READ**

1. This work is to be done individually.
2. You should submit only one version via D2L. Check instructions from TA regarding what to submit (zip/just code). Code files must always be included.
3. Keep a copy of everything you submit in some online storage that is accessible by you only.

# EXERCISES

1. Write (and test) the following function.

int GetNthItem(int\* arr, int size, int &start, int n);

This function returns the item at index/position n in array arr with size items. When you call this function in main the value passed to start must be 0. So the call in main may look as follows

int value = GetNthItem(a, s, st, indexOfInterest);

where,

a = an array of integers

s = number of integers in a

st = 0 (set before this line)

indexOfInterest = input from user??? or you can just set this to some value yourself for testing

value = item at position indexOfInterest in a

There is no need to validate start and n inside GetNthItem, we assume these are correct. This function must be recursive.

1. Write (and test) the following function.

int\* Slice(int\* arr, int size, int start, int end, int &newSize);

This function returns items from arr[start] to arr[end] (both inclusive) as a new array and the size of this new array is set to newSize (this way calling function will know how many items there are in the returned array).

The function should validate start and end. This function need not be recursive.

1. Write (and test) the following function.

bool IsSorted(int\* arr, int size);

This function returns true if arr is sorted in ascending order, false otherwise.

Your implementation must be recursive.

1. Write (and test) the following function.

int\* MergeInOrder(int\* left, int leftSize, int\* right, int rightSize);

This function returns a new array with contents from left and right ***merged in order*** (ask me if you are unsure what this means). Assume left and right are already sorted, hence returned array will also be sorted after the merge. CANNOT MERGE left and right first, then sort – MUST merge in order.

This function need not be recursive.

1. Write (and test) the following functions.

int DigitProduct(int value);

This function returns the product of all digits in value. For example, DigitProduct(1234) will return 24 (since 1\*2\*3\*4 is 24).

This function must be recursive.