# Introduction to Computer Science and Programming 1

# CSCI120

### Chapter8: List

Sample Codes

# Requirements

* Please use meaningful name for your variables and functions
* Try to reuse your solutions as much as possible.
* For each of the following problem you need to
  + Define a function
  + For all test cases you have already written for your algorithm, write a function call inside the main function
* Define all the functions in one file (all in one)
* Define one main function
* Call the functions inside the main function
* If the function you have implemented for a question is big, please try to break down to multiple functions.
* Do not use methods, functions, statements that we have not covered in the previous lectures.
* Some hints are provided for each question. The hints are only some suggestions. You can come up with your own idea without using the suggested hint.

# Problem1

* Write a function which take a list of number as an input parameter and find the second maximum of the list. The second maximum is a number which is bigger than or equal to all numbers but smaller than the maximum of the list.

**Problem2**

* Define and implement a function which does linear search. This function receives two input parameters, one is a list of integers and the other one is a number to search for. The function returns -1 if the number (the second parameter of the function) does not exist in the list or return the index of the number if the number exists in the list.
* If there are more than one occurrence of the number, the function will return the index of the first occurrence

**Problem3**

* Design and implement a function which receives two input parameters 1) a list of integer numbers and 2) a number. The function will find any occurrence of the given input number in the list and remove the number from the list and finally will return the new list.

**Problem4**

* Implement a function which receives a list of numbers as an input parameter. The function will find a sub-list from the list which is sorted and its length is greater than 4 and return the sub-list. If there are more than 1 sub-list, the function can return only one of them. If there is no such sub-list in the list, the function will return None.