CS2302 - Data Structures

Spring 2023

Sets - Exercise 1

1. Write the function *remove_smaller(S,k)* that receives a set of integers S and an integer k and removes from S all items that are smaller than k.

2. Write the function *no_duplicates(L)* that receives a list of integers L and returns a list containing the result of removing duplicate elements in L. The elements must appear in the same order they appeared in L; if an element appears multiple times in L, only its first appearance should be included in the returned list. For example, *no_duplicates([3,6,2,3,1,2,7,3])* should return *[3,6,2,1,7])*. Use a set to enable the function to run in $O(n)$ time.

3. Write the function *sum_of_two(L,s)* that receives a list of integers L and an integer s and determines if there are two integers i and j in L such that $i + j = s$. If the items exist, it should return a list containing the two items; if they don't exist, it should return an empty list. Your solution must run in time $O(n)$.

4. Write the function *repeated_substrings(S,m)* that receives a string S and an integer m and returns a list containing all the sub-strings of length m that appear more than once in S. Your solution must run in time $O(n)$.