Programming and Data Structures Lab (CS2710)
Assignment-09: Set ADT and *Hashing*

Lab-work:

1. Check Duplicates in an Array within k distance
   Inputs: An unsorted integer array, A[] (of size n), and a distance value, k (< n)
   Outputs: Indicate TRUE if A[] has a duplicate element within k distance; otherwise FALSE
   Print the duplicate element (in case present).
   Hint: Simple method => O(k.n) time; Use Hashing => O(n) time

2. Use Hashing to check that given an array A[] of n integers and an integer number x, check for the pair in A[] with sum as x.
   Inputs:
   (a) The array A[] of n integers; and
   (b) An integer number x
   Outputs:
   (c) Two integers, p and q, from A[] such that, p + q = x
   (d) Indicate if such p and q can not be found from A[]
   Hint: The steps are as follows –
   i. Initialize Binary Hash Map M[] = {0, 0, ...}
   ii. Do the following for each element A[i] in A[]:
   If M[x - A[i]] is set then print the pair (A[i], x – A[i]) and Set M[A[i]]

- -

Home-work:

1. Disjoint Set ADT using Tree based implementation and Path compression techniques
   Operations: (a) Make-Set, (b) Find, (c) Remove,
   (d) Union, (e) Intersection, (f) Difference,
   (g) Membership, (h) Cardinality, (i) Subset / Superset