DS Lab (CSN 261)

Assignment 6

Q1. WAP to implement hashing using linked list with the following numbers -

9, 17, 89, 103, 211, 64, 516, 81, 32, 76, 21, 137

i. Let size of the hash table is 6. Considering the hash function as (3x+4) mod 6, return index number and size of the largest sequence created due to mappings using separate chaining technique of collision resistance.

ii. Now, suppose size of the hash table is 12. Implement linear probing to avoid collisions in a manner that no two even numbers can occupy the continuous space in the hash table.

Q2. A grey tree on a set of 1-dimensional points is a balanced BST (balance factor of 1) on those points. The points are stored in the leaves of the tree. Value of the internal node is defined as max of its left subtree. A grey tree on a set of points in d-dimensions is a recursively defined multi-level BST. Each level of the data structure is a BST on one of the d-dimensions. The first level is a BST on the first of the d-coordinates. Each vertex v of this tree contains an associated structure that is a $(d-1)$-dimensional grey tree on the last $(d-1)$-coordinates of the points stored in the subtree of v. Example of a 1-dimensional grey tree is:
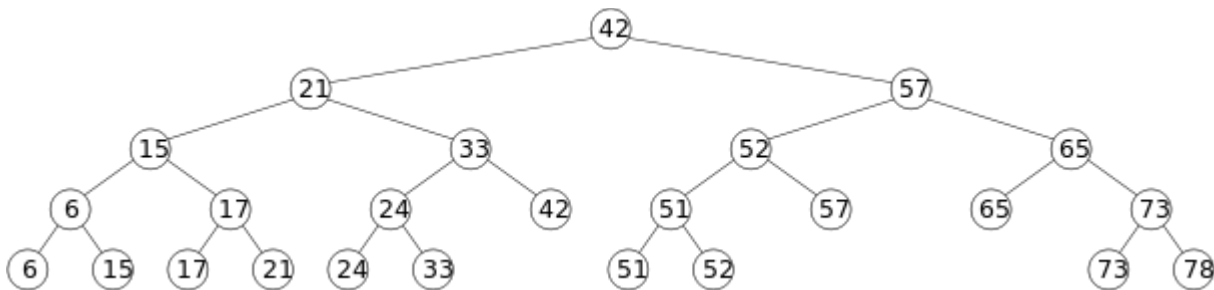
i. Write a routine to construct a 1-dimensional grey tree on n given points.

ii. Write a routine to find the points between the interval (a,b) in the grey tree.

iii. Write a routine to delete a given value from the tree.