Birla Institute of Technology & Science, Pilani
2nd Semester 2016-17 - CS F211 – Data Structures and Algorithms

Lab 2 - 29th Jan 2017
Topics – Abstract Data Types and Performance Measurements

Problem 2: Modify above implementation to add following functions:

3	insertCycle	Should read an integer N from stdin and make last node of existing list to point to *Nth* node of the list, thus creating a cycle.
4	hasCycle	Should print 1 if cycle exists in the list, otherwise it should print 0.
5	traverseGeneric	Generic form of traverse function to handle linear (i.e. Acyclic) as well cyclic linked list.
6	destroyGeneric	Generic form of destroy function to handle linear (i.e. Acyclic) as well cyclic linked list.

Algorithm for hasCycle:
To detect a cycle in the DynamicList by reversal of links: repeatedly reverse every link in the list while traversing it; if you revisit the head node then there is a cycle.
Test Case 1:

Input 2	Output 2
0 12 5 6 7 6 7 6 7 -1 1 3 8 5 4 6 2 -1	12 5 6 7 6 7 6 7 -2 12 5 6 7 6 7 6 7 -2 12 5 6 7 6 7 6 7 -2 1 -2 -3

Test Case 2:

Input 2	Output 2
0 1 -1 0	1 -2 1 1 -2 1 1 -2

1 -1 3 1 5 4 6 4 2 -1	1 -2 0 -3

Test Case 3:

Input 2	Output 2
0 12 5 12 5 2 -1 3 3 5 4 6 5 -1	12 5 12 5 2 -2 12 5 12 5 2 -2 1 -2 -2

Test Case 4:

Input 2	Output 2
0 12 5 12 5 2 -1 5 4 6 5 -1	12 5 12 5 2 -2 12 5 12 5 2 -2 0 -2 -2