### Detect Loop in linked list

Given a linked list of **N** nodes. The task is to check if the linked list has a loop. Linked list can contain self loop.

**Example 1:**

**Input:**

N = 3

value[] = {1,3,4}

x(position at which tail is connected) = 2

**Output:** True

**Explanation:** In above test case N = 3.

The linked list with nodes N = 3 is

given. Then value of x=2 is given which

means last node is connected with xth

node of linked list. Therefore, there

exists a loop.

**Example 2:**

**Input:**

N = 4

value[] = {1,8,3,4}

x = 0

**Output:** False

**Explanation:** For N = 4 ,x = 0 means

then lastNode->next = NULL, then

the Linked list does not contains

any loop.

**Expected Time Complexity:** O(N)  
**Expected Auxiliary Space:** O(1)

**Constraints:**  
1 ≤ N ≤ 104  
1 ≤ Data on Node ≤ 103

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Java code

//{ Driver Code Starts

//Initial template code for JAVA

import java.util.\*;

import java.io.\*;

import java.lang.\*;

class Node

{

int data;

Node next;

Node(int x)

{

data = x;

next = null;

}

}

class CodingMaxima

{

public static void makeLoop(Node head, Node tail, int x){

if (x == 0) return;

Node curr = head;

for(int i=1; i<x; i++)

curr = curr.next;

tail.next = curr;

}

public static void main (String[] args){

Scanner sc = new Scanner(System.in);

int t = sc.nextInt();

while(t--> 0)

{

int n = sc.nextInt();

int num = sc.nextInt();

Node head = new Node(num);

Node tail = head;

for(int i=0; i<n-1; i++)

{

num = sc.nextInt();

tail.next = new Node(num);

tail = tail.next;

}

int pos = sc.nextInt();

makeLoop(head, tail, pos);

Solution x = new Solution();

if( x.detectLoop(head) )

System.out.println("True");

else

System.out.println("False");

}

}

}

// } Driver Code Ends

class Solution {

//Function to check if the linked list has a loop.

public static boolean detectLoop(Node h){

HashSet<Node> s = new HashSet<Node>();

while (h != null) {

if (s.contains(h))

return true;

s.add(h);

h = h.next;

}

return false;

}

}