Assignment-1

Q1. Given a linked list of **N** nodes, the task is to check if the linked list has a loop or not. If there is a loop, then count the number of nodes in the loop. And then, delete the starting node of the loop and print the resulting linked list.

Input:
First line of input contains the number of testcases T. For each testcase, first line of input contains length of linked list and next line contains the data of linked list. Then, next line contains the value of x which means last node is connected with xth node of linked list.

Output:
For each testcase, print "**True**", if linked list contains loop, else print "**False**". Print the count of nodes in the loop. Then, delete the starting node of the loop and print the linked list.

Constraints:
1 <= T <= 50
1 <= N <= 300

Example:

Input:

2

5

1 3 4 7 5

2

6

1 8 3 4 2 9

0

Output:

True

4

1 4 7 5

False

0

1 8 3 4 2 9

Explanation:

In the above example, test cases T=2.

For Test Case 1: N = 5

The value of x=2 is given which means last node is connected with xth node of linked list. Therefore, there exists a loop.

For Test Case 2: N = 6

x = 0 means then lastNode->next = NULL, then the Linked list does not contains any loop.

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Q2. Given a string, write a function to compress the string in the following manner:

Input: aabbbcccabaddee

Output: a2b3c3a1b1a1d2e2

For each character, output will contain the character and no. of times it is contiguously repeated.

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Q3. Using BigInteger class:

Write a Java program that takes a String as its command-line argument and prints out the complete prime factorization of its length in ascending order.

Sample Input 1:

Earthshaking

Sample Output 1:

2*2*3

Sample Input 2:

Multiplication

Sample Output 2:

2*7