### **SIENA COLLEGE**

**28th Annual** High School Programming Contest

##### **March 27, 2015**

###### Problem #3: Polygon Labeling

Background Information: It is often useful to determine if two ways of labeling (regular) polygons are *cycles* of each other – that is, if rotating one polygon will put the vertices in the same positions as the second one. The polygons in Figures 1 & 2 below are cycles of each other; the polygon in Figure 3 is not a cycle of the other two.

B

C

E

A

D

A

B

D

E

C

A

B

D

C

E

 Figure 1 Figure 2 Figure 3

You will write a program that will receive as input an integer indicating the number of sides and then two lists of uppercase letters (representing the labels on the vertices in clockwise order); it must determine whether or not they are cycles of each other. The program will output either CYCLE or NO CYCLE.

Programming Problem:

 Input: Three lines containing, in order:

1. An integer N from 3 to 20 inclusive
2. A string of capital letters of length N with no duplicates
3. A string of capital letters of length N with no duplicates

*(NOTE: The two strings may be identical; this should be considered a cycle.)*

 Output: On a line by itself, one of CYCLE or NO CYCLE.

 Example 1: Input: 8

 ABCDEFGH

 DEFGHABC

 Output: CYCLE

 Example 2: Input: 5

 VWXYZ

WXYVZ

 Output: NO CYCLE

 Example 3: Input: 3

 ABC

XYZ

 Output: NO CYCLE