**Siena College’s 32nd Annual** **High School Programming Contest**

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##### **March 29, 2019**

###### Gold Problem #5:  ABRACADABRA – It’s not Magic! It’s Majorities!

Background Information:  ABRACADABRA is a ***balanced word*** but it’s not a ***perfectly balanced word.***.

A ***perfectly balanced word*** has the same number of each type of letter in its right and left halves. For example, NOON, NONO, and ONION are perfectly balanced words. Each of these words has 1 N and 1 O in its right and left halves. When a word has an odd number of letters like ONION, the middle letter does not factor into the balance.

A majority side for a letter in a word is the side (right or left) that has the most occurrences of this letter. For example, in the word AABCBCBAACBABCAACBCAA there are 4 As on the left side and 5 As on the right side so AABCBCBAACBABCAACBCAA has a ***right majority side*** for the letter A. Likewise, since there are 3 Bs on the left and 2 Bs on the right, this word has a ***left majority side*** for the letter B. There is no majority side for the letter C because each side has three Cs. If a word has more left majority side letters, then the word is ***left unbalanced***. If it has more right majority side letters, then the word is ***right unbalanced***. If the number of majority letters is the same, like it is for AABCBCBAACBABCAACBCAA, then the word is a ***balanced word***.

For this problem, you will write a program thatwill take a word as input and then identify whether it is ***perfectly balanced***, ***balanced***, ***right unbalanced***, or ***right unbalanced***.

###### Programming Problem:

Input:   A word with between 1 and 55 uppercase letters. (all uppercase and no lowercase)

Output:  Two lines. The input word on the first line. On the second line, one of the following four identifications (all uppercase):

1. PERFECTLY BALANCED 2. BALANCED 3. RIGHT UNBALANCED, 4. LEFT UNBALANCED.

###### Example 1: Input: ABRACADABRA

######  Output: ABRACADABRA

 BALANCED

###### Example 2: Input: ABCDEAAAAA

######  Output: ABCDEAAAAA

 LEFT UNBALANCED

###### Example 3: Input: ONION

######  Output: ONION

 PERFECTLY BALANCED

###### Example 4: Input AAAAAAAAAAAAAAAAAAAAAAAAABCDEFGHIJKLMNOPQRSTUVWXYZ

######  Output: AAAAAAAAAAAAAAAAAAAAAAAAABCDEFGHIJKLMNOPQRSTUVWXYZ

 RIGHT UNBALANCED

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