**PROBLEM**: Build a binary search tree and find the value for each of the following:

1. Depth of the tree
2. Number of leaf nodes
3. Number of nodes with one child
4. Internal path length
5. External path length

Keep in mind that duplicate keys are inserted into a binary search tree as if they were less than their equal key already in the tree.

Here is the binary search tree from the letters A M E R I C A N:



The tree has a depth of 3; there are four leaf nodes (A C I N). The only node with one child is R. The tree has an i*nternal path length* of 15: the sum of the depths of all nodes. It has an *external path length* of 31: the sum of the depths of all external nodes.

**INPUT:** There will be 2 lines of input, each line will be a string. Ignore all characters in the string other than letters. The string is case-sensitive. That is, the uppercase “M” (ASCII 77) is different than the lowercase “m” (ASCII 109). Be sure to follow the convention ~~is~~ that all uppercase letters are less than all lowercase letters.

**OUTPUT**: For each input string, print the 5 statistics listed above in the order listed above.

|  |  |
| --- | --- |
| **SAMPLE INPUT:**   1. Winnie the Pooh and Tigger too 2. Cinderella and her evil stepsisters | **SAMPLE OUTPUT:**   1. 7 2. 7 3. 12 4. 103 5. 153 6. 8 7. 9 8. 14 9. 141 10. 203 |

**TEST DATA**

***Answers must match the output exactly as shown.***

**TEST INPUT:**

1. American Computer Science League was formed in 1978.
2. Newbury Park High School is located in Thousand Oaks, California, 91320

**TEST OUTPUT:**

1. 10
2. 13
3. 15
4. 198
5. 278
6. 13
7. 16
8. 23
9. 381
10. 489