carbon 12.0110

hydrogen 1.0079

oxygen 15.9994

Students:

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(1) 6 points. Revise your program for the molecular weight of a chemical compound of hydrogen, carbon, and oxygen, so that it can take as user input a chemical formula of the form C2H5OH for ethyl alcohol, COOHC6H4OCOCH3 or C9H8O4 for aspirin, CH3CH2CH2CH2CH2CH2CH2CH3 or C8H18 for octane, and so forth. You could write a function to parse an input string of this form, which could return the total counts of hydrogen, carbon, and oxygen in the compound, and then use the formula in your previous section 2.11 assignment to compute the molecular weight. I suggest you use **list** for these three counts, and increment the appropriate count as you process the input string. Be careful to deal with the case when there is no number following the letter, which means the implied number is just one, and the case, as for octane above, when the number after a letter has more than one digit.

The program should keep outputting the prompt “Enter a chemical formula, or just the enter key to quit:” for the chemical formula of a new compound, until the user presses only the enter key without a chemical formula, in which case the program should terminate. The molecular weights should be printed with exactly four digits after the decimal point (since the atomic weights from section 2.11 have four decimal places).

Below is my output for the four chemical formulas above. The user input will not appear in the output used by the zyBooks comparison tests when grading. There are also some hidden test cases.

Enter a chemical formula, or just the enter key to quit: C2H5OH

The molecular weight is 46.068

Enter a chemical formula, or just the enter key to quit: COOHC6H4OCOCH3

The molecular weight is 180.1598

Enter a chemical formula, or just the enter key to quit: C9H8O4

The molecular weight is 180.1598

Enter a chemical formula, or just the enter key to quit: C8H18

The molecular weight is 114.2302

Enter a chemical formula, or enter key to quit:

(2) 3 point. Modify your program so that if the user enters an invalid formula, for example, one that contains other characters besides digits and C, H, and O, or begins with a digit, the program will print the line “Badly formed molecular formula; try again.” And then the input prompt again. So a possible session might look like:

Enter a chemical formula, or just the enter key to quit: 14H

Badly formed molecular formula; try again.

Enter a chemical formula, or just the enter key to quit: h14

Badly formed molecular formula; try again.

Enter a chemical formula, or just the enter key to quit: H14

The molecular weight is 14.1106

Enter a chemical formula, or enter key to quit:

S=input(“Enter a chemical formula, or just the enter key to quit:”);

>>> l=list(S)

>>> print(l);

>>> list1 = ['physics', 'chemistry', 1997, 2000];

>>> print(list1)

['physics', 'chemistry', 1997, 2000]

[len(list)](http://www.runoob.com/python/att-list-len.html)  
列表元素个数

[list.count(obj)](http://www.runoob.com/python/att-list-count.html)  
统计某个元素在列表中出现的次数

[list.index(obj)](http://www.runoob.com/python/att-list-index.html)  
从列表中找出某个值第一个匹配项的索引位置

初始化N用来存放各原子的个数，初值均为0

退出

输入的是不是回车？

While True

提示输入分子式，把键入的分子式存入字符串S

初始化：

A是存储3种原子的list

W是存储3种原子量的list

B是存储0-9这十个数字的list