We have been given a file of chemical formulae, specifically hydrocarbons. Hydrocarbons consist of only hydrogen and carbon atoms.

Each line of the file contains the name of the chemical followed by its molecular formula which will be in the form**:**  
C#H#  
where # is the number of carbon (C) and hydrogen (H) atoms.  
(No name in the file contains blanks.)

Because hydrocarbons with the same molecular formula can appear in many structural forms and each of the forms has a different name, the same molecular formula might appear more than once in the file with different names. (*e.g.*: Butane and 2-methylpropane both have the molecular formula C4H10.)

Our goal is to keep one entry for each unique molecular formula along with all the names for that formula and then display all these entries in order by ascending number of carbon atoms. (We can do this without actually sorting the items by making multiple passes over the vector, first printing all forumlas with one carbon, then all with two carbons, etc.)

Each molecular formula will be kept in a struct with *three* fields**:**

* the name(s) for formula
* the number of carbon atoms
* the number of hydrogen atoms

We will be storing all these structs in a vector.

**An example**

Suppose this is the content of sample file**:**

n-Butane C4H10

Propyne C3H3

1,3-Butadiyne C4H2

Hexane C6H14

Butane C4H10

iso-Butane C4H10

Pentane C5H12

Your program should store these five entries and then display something like**:**

C3H3 Propyne

C4H10 n-Butane Butane iso-Butane

C4H2 1,3-Butadiyne

C5H12 Pentane

C6H14 Hexane

Notice that the output is "sorted" only by the number of carbon atoms.  
There is no attempt to sort by anything else.  
Or, put another way**:** all other orderings show simply the order the items were taken from the file.

Using the same data from above, a less compressed but possibly less ugly format, if there is lots of data, might be**:**

C3H3

Propyne

C4H10

n-Butane

Butane

iso-Butane

C4H2

1,3-Butadiyne

C5H12

Pentane

C6H14

Hexane

Here is a better sample/test file data with lots and lots of hydrocarbons.

Ethane C2H6

ethylene C2H4

Propane C3H8

Propyne C3H3

Butane C4H10

n-Butane C4H10

iso-Butane C4H10

Pentane C5H12

Hexane C6H14

Heptane C7H16

Octane C8H18

Nonane C9H20

Decane C10H22

m-Quinquephenyl C30H22

Anthracene,9,10-diphenyl- C26H18

Tetrabenzo[a,c,g,s]heptaphene C46H26

1,2-Propadiene C3H3

[16]Annulene C16H16

Cyclobutadiene C4H4

1,6-Ethenocyclopenta[cd]pentaleno[2,1,6-gha]pentalene,1,1a,3a,3b,5a,5b,6,6a,6b,6c-decahydro- C16H16

Dibenzo[a,jk]phenanthro[8,9,10,12-cdefgh]pyranthrene C44H20

9H-Fluorene,9-(1-methylethyl)- C16H16

2-methylpropane C4H10

(2.2)Metacyclophane C16H16

p-Quinquephenyl C30H22

1-methyl-4-(triphenylmethyl)benzene C26H22

1,3-Butadiyne C4H2

Hexabenzo[a,d,g,j,m,p]coronene C48H24

Benzene,1,1'-ethenylidenebis-[4-methyl- C16H16

Butane,2-methyl- C5H12

Tetrabenzo[b,g,k,p]chrysene C34H20

1,1'-Binaphthalene,7,7'-dimethyl- C22H18

1,2,3-Butatriene C4H4

Violanthrene C34H20

1-(1-Naphthylmethyl)naphthalene C21H16

1,1'-Binaphthalene,8,8'-dimethyl- C22H18

1,2,4,5-1',2',4',5'-[2.2.2.2]Cyclooctatetraenocyclophane C22H22

trans-1,2-Diphenyl-1-methylcyclopropane C16H16

1,1'-Binaphthalene,3,3'-dimethyl- C22H18

Pentaphenylethane C32H26

(E)-1,2-Bis(4-methylphenyl)ethene C16H16

20-Methylcholanthrene C21H16

1',2',3',4'-Tetrahydro-1,2-dinaphthylmethane C21H20

benzene,1,1',1''-methylidynetris[4-methyl- C22H22

[2.2]Paracyclophane C16H16

7H-Dibenzo-8,9,10,11-tetrahydro- C21H18

4-cyclobutyl-1,1'-biphenyl C16H16

1,1'-Binaphthalene,2,2'-dimethyl- C22H18

Methane C1H4

Ethynyl(Radical) C2H1

Bisbenzo[5,6]phenanthro[3,4-c:4',3'-g]phenanthrene C46H26

Benz[j]heptaphene C34H20

Cyclopropene C3H3

Methyldodecahedrane C21H22

2-Methyl[2.2]paracyclophane C17H18

1,2,3-Triphenylcyclopropene C21H16

1,1-diphenyl-1-pentene C17H18

Acepleiadane C16H16

CH2=CHCH=C(Radical) C4H4

Propane,2,2-dimethyl- C5H12

1,1-Di-o-tolylethylene C16H16

9,9'-Bi-9H-fluorene C26H18

(Z)-1,2-Bis(4-methylphenyl)ethene C16H16

4,7,12-Trimethylbenz[a]anthracene C21H18

cyclohexanonacontane C96H192

Pyrene,1,2,3,6,7,8-hexahydro- C16H16

Vinylacetylene C4H4

Bisnaphtho[1',2':5,6]phenanthro[3,4-c:4',3'-g]phenanthrene C54H30

hectane C100H202

6,7-Benzotetracyclo[7.3.0.04,8.05,12]dodeca-6,10-diene C16H16

Isoviolanthrene C34H20

Methylenecyclopropene C4H4

Naphtho[2,1-c]phenanthro[4,3-g]phenanthrene C34H20

1,2-Di(.allpha.-naphthyl)-ethane C22H18

hexahexacontane C66H134

Isopropyl(Radical) C3H7

Bicyclo[1.1.0]but-1(3)-ene C4H4

Tetrabenzo[a,c,m,o]naphtho[1,2,3,4-rst]pentaphene C44H24

Tetrabenzo[a,c,j,l]naphthacene C34H20

2,2-Metaparacyclophane C16H16

cis-1,2-Diphenyl-1-methylcyclopropane C16H16

[2.2.2.2.2](1,2,3,4,5)Cyclophane C22H22

Benzene,1,1',1'',1'''-(1-propyn-1-yl-3-ylidyne)tetrakis- C27H20

7-Phenyl-2,5-di-tert-butylcyclohepta-1,3,5-triene C21H28

Methylidyne C1H1

n-Propyl(Radical) C3H7

Benzo[a]phenanthro[9,10-c]naphthacene C34H20