Exercises

1. Writing to Multiple SAS Data Sets

The data set **Course2.elements** contains information about the known elements in the periodic table. Each observation contains an element's name, symbol, atomic number, and state. The value of **State** refers to whether the element is a gas, liquid, solid, or synthetic at room temperature.

A *synthetic element* is an element that is not present in nature.

Create four SAS data sets: **gas**, **liquid**, **solid**, and **synthetic**. Each data set will contain information about those elements that have that state at room temperature. Each of these four data sets should contain three variables; they should not contain the **State** variable.

Character values are case-sensitive.

The **gas** data set should contain 11 observations. The **liquid** data set should contain three observations. The **solid** data set should contain 78 observations. The **synthetic** data set should contain 21 observations.

Partial Listing of **prog2.elements**

Name	Symbol	Atomic Num	State
Actinium	Ac	89	Solid
Aluminum	Al	13	Solid
Americium	Am	95	Synthetic
Antimony	Sb	51	Solid
Argon	Ar	18	Gas
Arsenic	As	33	Solid
Astatine	At	85	Solid
Barium	Ba	56	Solid
Berkelium	Bk	97	Synthetic
Beryllium	Be	4	Solid
Bismuth	Bi	83	Solid
Bohrium	Bh	107	Solid
Boron	B	5	Solid
Bromine	Br	35	Liquid

Listing of **liquid**

Obs	Name	Symbol	Atomic Num
1	Bromine	Br	35
2	Francium	Fr	87
3	Mercury	Hg	80

The names of elements and their symbols are approved by IUPAC, the International Union of Pure and Applied Chemistry. IUPAC has not approved names for elements with atomic numbers above 109; therefore, temporary IUPAC names are used.

In 1999, a team of scientists announced the observation of what appeared to be elements 116 (ununhexium) and 118 (ununoctium). In 2001, the team retracted its original paper after several confirmation experiments failed to reproduce the desired results.

In 2004, a team of scientists from the Lawrence Livermore National Laboratory and the Joint Institute of Nuclear Research in Russia announced the discovery of the superheavy elements 113 (ununtrium, uut) and 115 (ununpentium, uup).

Element 117 (ununseptium, uus) is not yet discovered.

2. Controlling Input and Output Size

Recall that the **Course2.elements** data set contains information about the known elements on the periodic table. Each observation contains an element's name, symbol, atomic number, and state. The value of **State** refers to whether the element is a gas, liquid, solid, or synthetic at room temperature.

Partial Listing of Course**2.elements**

Name	Symbol	Atomic Num	State
Actinium	Ac	89	Solid
Aluminum	Al	13	Solid
Americium	Am	95	Synthetic
Antimony	Sb	51	Solid
Argon	Ar	18	Gas

Create two SAS data sets: **natural** and **synthetic**.

The **natural** data set will contain information about elements that are solids, liquids, or gases at room temperature. The **natural** data set will contain three variables (**Name**, **AtomicNum**, and **State**) and 92 observations.

The **synthetic** data set will contain two variables (**Name** and **AtomicNum**) and 21 observations.

Partial Listing of **natural**

Obs	Name	Atomic Num	State
1	Actinium	89	Solid
2	Aluminum	13	Solid
3	Antimony	51	Solid
4	Argon	18	Gas
5	Arsenic	33	Solid

Partial Listing of **synthetic**

Obs	Name	Atomic Num
1	Americium	95
2	Berkelium	97
3	Californium	98
4	Curium	96
5	Dubnium	105