**Objects and Classes**  
**Workshop 3**

**In this workshop, you’ll learn:**

* Design and code a class for a simple object,
* Write code that includes robust user input validation, and
* Write code that includes formatted program output.

**1. Molecules**

Design and code a class named Molecule that holds information about a single molecule.  Place your class declaration and definition in a file named Molecule.java

The Molecule class has the following members:

**State/Data/Attributes**

* **structure**: a string that contains characters or numbers only, holding the molecular structure.
* **name**: a string that holding the full name of the molecule and.
* **weight**: a positive, less than 100 floating point value holding the molecular weight.

**Behaviors/Operations/Methods**

* **Default constructor:** leave the object in safe empty state.
* **Constructor:** to set values for State/Data/Attributes.
* **void display()**: displays the molecular information on standard output.

Design and code a main program that accepts information for arbitrarily given numbers of molecules and displays the molecular information in tabular format.

**2. Atoms**

Design and code a class named Atom that holds information about a single atom.  Place your class declaration and definition in a file named Atom.java

The Atom class has the following members:

**State/Data/Attributes**

* **number**: an integer holding the atomic number,
* **symbol**: a string that holding the atomic symbol,
* **fullname:** a string that holding the full name of the atom
* **weight**: a floating-point value holding the atomic weight.

**Behaviors/Operations/Methods**

* **Default constructor:** leave the object in safe empty state.
* **bool accept()**: prompts for and accepts from standard input
* **void display()**: displays the atomic information on standard output.

Design and code a main program that accepts information for up to 10 atomic elements and displays the atomic information in tabular format.

The program output might look something like:

|  |
| --- |
| Atomic Information  ==================  Enter atomic number : 3  Enter symbol : Li  Enter full name : lithium  Enter atomic weight : 6.941  Enter atomic number : 20  Enter symbol : Ca  Enter full name : calcium  Enter atomic weight : 40.078  Enter atomic number : 30  Enter symbol : Zn  Enter full name : zinc  Enter atomic weight : 65.409  Enter atomic number : 0    3 Li lithium 6.941  20 Ca calcium 40.078  30 Zn zinc 65.409 |