Define Modules

Goals and motivation for the assignment: The purpose of this assignment is to give the student experience in identifying modules that are expected to be particularly useful in the design of a software system, especially where flexibility and evolvability are important considerations.

What is the assignment?:
In previous assignments you worked on providing details about a complex software system of interest to you. In the previous assignment you attempted to use precise software notations in defining a precise specification of some aspects of the requirements for the complex system. The purpose of this assignment is to go further and identify some modules that seem to be particularly useful as you contemplate how you would actually design and build a system to meet those requirements. For this assignment considering flexibility and evolvability requirements is especially important.

SPECIFICALLY:
1. Identify at least three data modules that you believe will be useful as component parts of your system’s implementation. For each proposed module you must identify the specific requirement element or elements and requirement type (e.g. robustness, functionality) that you believe the proposed module will help you to address more successfully. Most preferably you should select requirements elements for which flexibility and evolvability are important additional requirements. For each module you should explain why you believe that this module will provide an abstraction that will be useful.

2. Each module definition should consist of at least:
   • Module name
   • A description of the “secret” (or secrets) that this module is hiding. This can be in natural language (English).
   • The complete list of methods that you believe are needed to provide access to the module’s capabilities. These methods should be specified through the use of a rigorous, well-defined syntax, perhaps borrowed from a programming language (e.g. Java).
   • The decomposition of the module into submodules that you believe are needed. It will suffice to name the submodules and describe the secrets that they are being designed to hide.
   • A suggestion about one or more possible implementation approaches you believe should be considered for this module. For each implementation approach indicate what set of circumstances would suggest this implementation approach.
•FOR 620 STUDENTS ONLY: For these data modules, in addition to the above, use an abstract specification approach (e.g. algebraic specification, axiomatic specification or Z (“zed”) ) to define the semantics of the methods enumerated in the third bullet (above).

Anticipated length for 520 Students:  6-8 pages

Anticipated length for 620 Students: 8-10 pages