Answers to Homework Assignment #1

1.9   When implementing a control program for a dishwasher that has less than 10 different washing cycles, what paradigm would you use? Why?

The suitable paradigm is waterfall; the software is small, and once implemented, there will be no volatility during the life of the dishwasher.

1.10   When implementing a web site with 10 different pages for a medium size business, what paradigm would you use? Why?

The suitable paradigm is iterative; there will be frequent changes in the requirements.

2.8   Why is the term "lifecycle" misleading? Which term is more commonly used: life span model or life cycle?

The term "lifecycle" is misleading because there is no cycle in the lifespan model. In spite of that, term "lifecycle" is more commonly used.

2.9   In what situation V-model of the software lifespan can be used?

V-model is a derivative of the waterfall and it can be used in the situations where waterfall can be used, i.e. for short-lived software or for software in very stable domains.

2.10   What are the advantages and disadvantages of the prototyping model?

Advantage: It supports requirements elicitation and also supports dealing with the initial requirements volatility.
Disadvantage: It does not support requirements volatility after the prototyping stage is completed.

3.13   What is inheritance in Object Oriented technology? Give an example.

A relation between two classes, one called *base class* or *abstract class* and the other called *derived class* or *subclass.* Base class defines class members that are shared among all derived classes, while derived classes contain members that are specific to that particular class. An example of base class and derived class is Person and Customer.

3.14   What is the difference between an object and a class in OO technology?

An object is an instance of a class.

3.15 Describe the role of polymorphism in Object Oriented technology. Give an example.

Polymorphism allows the use of derived type in the place where base type appears. It allows the programmer to write more general code that applies to many situations.

3.16 Describe the role of information hiding in program comprehension.

Information hiding allows the object to present themselves being simpler than they truly are. As a result, the interaction between the objects is simpler, helping with comprehension of the software.

4.1 Draw a class diagram of a small banking system showing the association between three classes: the bank, customer, and account.
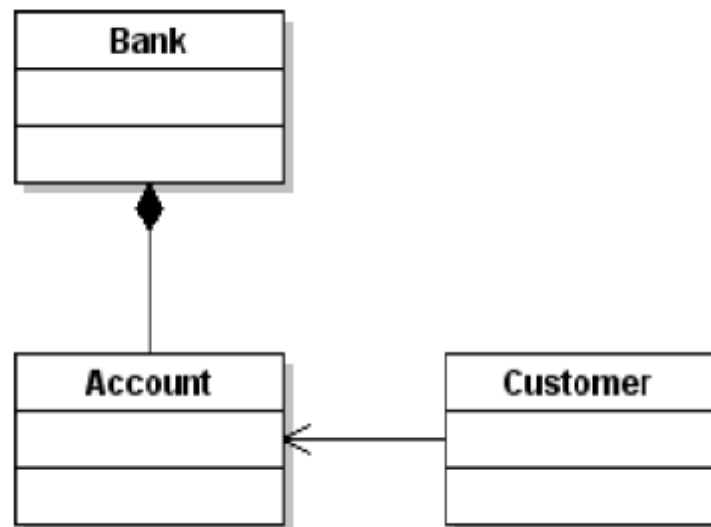
Solution to Exercise 4.1

4.3 Draw an activity diagram of pumping gas and paying by credit card at the pump. Include at least five activities, such as "Select fuel grade" and at least two decisions, such as "Get receipt?"
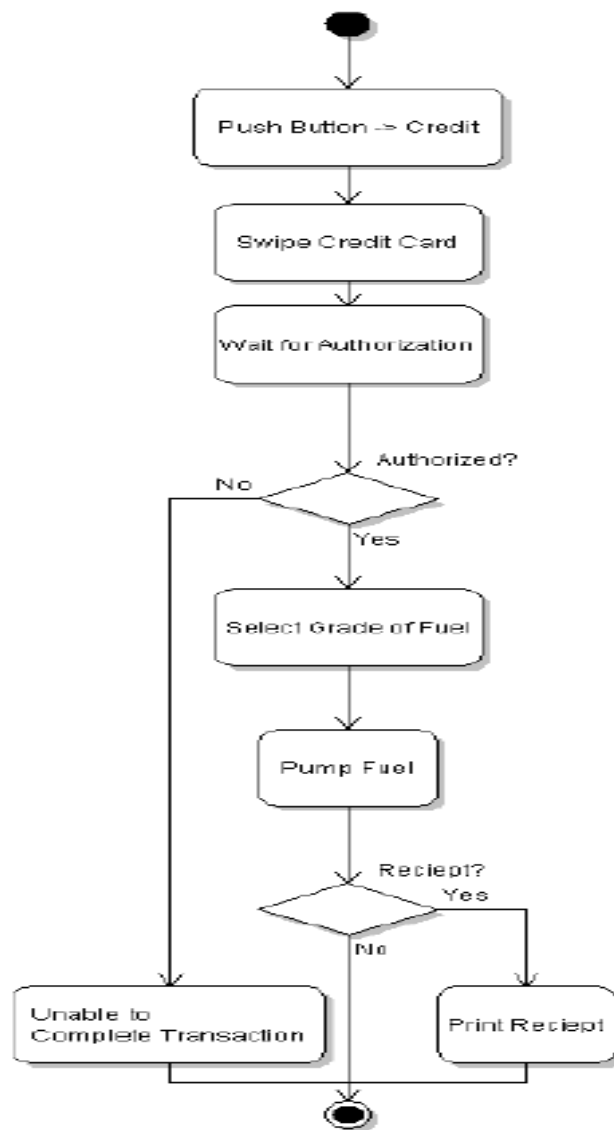
Solution to Exercise 4.3

4.9 Explain the meaning of the activity diagram in Figure 4.15.

The activity diagram shows the steps that need to be followed by a programmer using configuration management.