

# CSC 331-631: Programming Assignment # 3:

## Exploring the Strategy Pattern

Instructor: V. Paúl Pauca

*due date: Thursday November 7th*

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## 1 Design Patterns

A design pattern is a record of experience in software design. Design patterns use object-oriented concepts to provide well-thought out solutions to specific design problems. A good software engineer can apply design patterns early in the design process to meet specific non-functional requirements of a product such as maintainability, adaptability to changing functionality or functional requirements, etc.

## 2 What you need to do

Head First Design Patterns is an excellent resource for obtaining a practical understanding of the principles behind design patterns. This is what you need to do for this homework assignment:

1. Read “chapter 1: Intro to Design Patterns” in its entirety (pp. 1 – 35).

This chapter introduces the Strategy Pattern and you need to understand *exactly* what this pattern is about. Read carefully and wrap your brain around all the concepts that are discussed; there are several, e.g.

- Inheritance and reusability issues
  - Interfaces (abstract classes) and duplicate code issues
  - Static association of references and concrete objects and its implications in programming
  - Dynamics association of references and concrete objects (use of polymorphism) and its benefits
2. Implement the sample Java code and demonstrate to yourself that you understand the above concepts and benefits of using the Strategy Pattern.
  3. Understand and learn how to apply the three design principles introduced in this chapter.

## 3 What to turn in

Turn in a short paper addressing the following questions:

1. How is the strategy pattern addressing *each of the three design principles* of chapter 1? Address each design principle separately. Feel free to use snippets from your sample code or UML diagrams to show your point. (1.5 pages minimum, including code snippets or UML diagrams)
2. Give an example of a different situation where applying the strategy pattern makes sense. You can think one up or find one online. Explain how the strategy pattern would be applied. (1/2 page minimum)
3. **Grad students:** Provide a C++ implementation of the strategy pattern for the duck behavior example of Chapter 1. I will choose one of your implementations to share with students in CSC 331.