

CS 351 Software Engineering I

Homework #3 (50 points)

Date Due: Tuesday October 13 by **5pm**. Use the drop box outside EPS 356, hand it in during class, or email me your answers.

Instructions:

- Answer all questions clearly. Be succinct and precise.
- You may use resources such as the Internet, the Library, etc. Remember to cite your work.
- Use a word editor to format your work.

Question:

The *Strategy* pattern is a design pattern used to encapsulate different behaviors and/or algorithms. The idea is to allow you to swap those strategies at will during the execution of a program. The architecture of the program remains the same. According to Gamma et. al, the “*Strategy pattern is intended to define a family of algorithms, encapsulate each one, and make them interchangeable. Strategy lets the algorithm vary independently from clients that use it.*”

In this assignment, you are to implement a program in Java that uses the Strategy pattern to solve the following problem.

Develop a program that allows a user to change factorial computation strategies. Your program should include a non-interactive test driver that exercises the switching of strategies at runtime. You should develop at least two strategies which may be borrowed from any sources you want (cite your sources).

You are to hand in a UML class diagram of your design, a printout of your code, a printout of the output of your code that clearly shows how you change strategies at runtime, and the output of the factorial computation. Include print statements on every method to help instrument your code. Your code should be well documented (but not excessively).