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**CS 201**  
**Programming Assignment #1**  
**Making the World a Better Place**

Due 9/15/06, in class

**Introduction**

The goal of this assignment is to develop specifications for a Java program, to plan and test a Java program, and to provide an opportunity to use mathematical expressions in Java.

Most people who develop computer software don't do it for themselves or for an instructor's imaginary scenario. Most programs are written to solve a problem or answer a real need. Even though you don't yet know all of Java, you know enough to write a simple program that does a calculation that could be helpful to someone.

Find a simple mathematical calculation that is of use to someone else (a friend, a parent, a sibling). The first step is to ask the person and get a clear idea of the need. (No fair assuming your program will be helpful—you need to actually ask!) You can use email or the phone if the person is at a distance. Your program will do the calculation.

**Specifications**

- A. Use the standard introductory comment template (see the next page). Be sure to make good use of whitespace, in-line comments, and correct types for numeric variables (remember that decimal values cannot be assigned to `int`, `short`, `long`, or `byte`). Be careful in your use of mathematical symbols and `Math` class methods.
- B. Write a short narrative (100 words or less) — as a Java Comment after your code — telling
  - who the program was written for,
  - why the program was written,
  - how you gathered the specs for the program, and
  - how you tested the program; specifically, what values you used to test the program and why.
- C. The “customer” (*i.e.*, the person for whom the program was written) will be asked to evaluate your program at a later date, so be sure you've satisfied that person's need.

**What to hand in**

- (1) Your code (hard copy as well as a copy emailed to me with the subject  
CS201.<your section> <your name> Assignment 1
- (2) Don't forget the narrative.

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## Program Template

In the following template comments to you about the template appear between double square brackets such as [[ there is only 1 main method ]].

```
/** CS 201.<your section> Assignment <number>
 * <your name>
 * <the date>
 * <program's purpose and description>
 */

<imports>

/**
 * <describe this class's purpose>
 */
public class <name>
{
    /**
     * <Attribute Description>
     */
    <Attribute Definition>

    /**
     * <Method Description>
     */
    <Method Definition>

    // [[ the last method ]]
    public static void main(String [] args)
    {
        <local variable declarations for main>
        <statements of main>
    }
}
```

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## An Instantiation of the Template

```
/** CS 201.0 Assignment 0
 * Dave Binkley
 * 16 August 2006
 * This program provides an example instantiation of the template
 */

import java.util.Scanner;

/**
 * This class solves the quadratic Equation.
 */
public class instantiated
{
    /**
     * <Attribute Description>
     */
    //<Attribute Definition>  [[ none ]]

    /**
     * A method to multiple two numbers
     * [[ real cost would not include something so silly ]]
     */
    static public int multiple(int a, int b)
    {
        return a * b;
    }

    // [[ the last method ]]
    public static void main(String [] args)
    {
        int a, b, c, x, y;
        Scanner sc = new Scanner(System.in);
        System.out.print("Hi! I computer the Quadratic Equation. ");
        System.out.println("I have four questions:");

        // [[ repetition such as the following is an opportunity for abstraction! ]]
        System.out.print("What is the value of a");
        a = sc.nextInt();
        System.out.print("What is the value of b");
        b = sc.nextInt();
        System.out.print("What is the value of c");
        c = sc.nextInt();
        System.out.print("What is the value of x");
        x = sc.nextInt();

        y = a * x * x + b * x + c;          // [[ the way it is done ]]

        // [[ forced awkward use of 'multiple' method ]]
        y = a * multiple(x, x) + b * x + c;

        System.out.println("The answer is " + y);
    }
}
```