CS 1713 Exam 1 — Spring 2012

This is a closed book exam. Answer all questions on these sheets. If you need more room, use the last page which is blank. Do not spend too much time on any one problem. You do not have to do the problems in order. Put your name and seat number on the back of the last sheet.

Note: The last problem is harder than the other problems on this exam. Do not spend much time on the last problem unless you have done all you can on the other problems.

1) (6 points) Write a code segment that prompts the user to enter an integer and then assigns that integer to an **int** variable **x**.

2) (5 points) Write a code segment that prints the value of $\sqrt{2}$.

3) (6 points) Declare an array that can hold 4 integer values and initialize all of the entries to 17.

4) (6 points) Write a code segment that prints the values of the elements of the integer array, **a**, one per line in reverse order.

5) (5 points) Write a code segment that generates a random integer between 1 and 10 (inclusive) and prints it out.

6) (12 points) Write a code segment that generates three random integers between 1 and 10 (inclusive) and prints out only the largest one.

7) (12 points) Write a program segment for each of the following:
  a) Print an appropriate message indicating whether or not the double variable **x** is in the interval [10, 20]. (This interval contains both end points.)

  b) Print an appropriate message only when the double variable **x** is in the interval [10, 20].

  b) Print an appropriate message only when the double variable **x** is not the interval [10, 20].

8) (6 points) Write a program segment that prints the average of the elements of the integer array **a**. Handle the case of an empty array in a reasonable way.

9) (12 points) Suppose we have:

```
int x = 13;
int y = 3;
double z = 19.0;
double w = 5.0;
```

Evaluate each of the following expressions. Write your answer in a simplified form. Do not use fractions. Use two decimal places for numbers with a fractional part.

Show how you got your answer.

    a) x/y

    b) x/w

    c) (x + z)/y

    d) x/y + z/y

    e) x % y

    f) x/(y+2)+z/(y+2)

10) (15 points)

The table at the right gives the cost of light bulbs by wattage. Write a method that takes an integer parameter that represents the wattage of a light bulb and returns the cost of that light bulb based on this table.

wattage	cost
less than 40	$ 1.35
at least 40 and less than 60	$ 0.85
at least 60 and at most 100	$ 1.50
greater than 100	$ 2.00

11) (5 points) Explain in words what the following method does:

```
public static int mystery(int[] a) {
    int x = 0;
    if (a.length == 0)
        return -1;
    for (int i=1; i<a.length; i++)
        if (a[i] < a[x])
            x = i;
    return x;
}
```

12) (10 points)

    a) Write a method that reads integers from the keyboard until a negative value is entered, and returns the last non-negative number entered. Return -1 if no non-negative numbers are entered. Assume that only integers will be entered. This method does no prompting.

    b) Explain in words what your solution to part a) would do if a non-integer value were entered. Also describe how you could fix this problem.