IT 313 -- Midterm Exam

February 10, 2013

Part A: True/False Questions. Circle each correct answer. Give a reason to support each answer.

1. **T F.** Command line arguments cannot be used with Eclipse.

2. **T F.** A cast can be used to convert a char value to an int value.

3. **T F.** The possible return values of `3 + Math.floor(2 * Math.random( ))` are 3, 4, and 5.

4. **T F.** A `Scanner` object can read data from the web.

5. **T F.** A `String` object is immutable.

6. **T F.** The return type of a constructor is always void.

7. **T F.** The hex representation of the Windows end of line terminator is `0a0b`.

8. **T F.** Use a `PrintStream` object to write text output to a disk file.

9. **T F.** `a.length` returns the length of the array a.

10. **T F.** An instance method must always be called from an object.

Part B : Predict the Output. Predict the output of these Java fragments?

1. What printed to the computer screen?

```
byte a = (byte) 0x4b;
byte b = (byte) 0xf9;
System.out.printf(a + " " + b);
```

2. What printed to the computer screen? Recall that the Java byte datatype is signed.

```
byte a = (byte) 0xd6;
byte b = (byte) 0x52;
byte c = (byte) ((a & b) | (a ^ b));
System.out.printf("%02x % d\n", c, (byte)(~b));
```

3. What appears in the output file **`out.txt`** when opened with Notepad?

```
DataOutputStream outStream = new DataOutputStream(
    new FileOutputStream("out.txt"));

    int w = 0x436f6c64;
    outStream.writeInt(w);
    outStream.close( );
```

Part B : Write Methods. Write a static method that belongs to the class that contains the main method. Also write a main method with statements that test your method. Do only 1 out of 2 problems.

1. Write a method named **`isSorted`** that inputs a double array of size 3. It should return true if **`a[0]`** ≤ **`a[1]`** ≤ **`a[2]`** and returns false otherwise. The input parameter is declared as **`double[ ] array`** .

2. Write a method named **`countWords`** that returns the number of words in an input string, where each pair of words is separated by a single space. Use trim to remove leading or trailing blanks in the input string.

Part C: Correct Errors and Test Class

1. Correct the errors in this CashRegister class. There are about 12 errors.

```
public class CashRegister {
     public double _totalAmountOfSale;
     public int _totalItems;

     public void CashRegister( ) {
          this.clear( );
     }
     public double getTotalAmountOfSale( )
          return _totalAmountOfSale;
     }
     public int getTotalItems( ) {
          return totalItems;
     }
     public void enterItem(double amount) {
         _totalAmountOfSale += amount;
         _totalItems += 1;
         System.out.print('Price of item: %$6.2f/n'
             amount);
     }
     public clear( ) {
         _totalAmountOfSale = 0.0;
         _totalItems = 0
     }
```

2. Write a main method that tests each method of the CashRegister class.

Part D: Use Class from Java Class Library.

1. Select one constructor and four methods from the Java Paper class in the Java Class Library. (See the printed documentation for the Paper class.) Write a main method that calls each of these methods? A standard letter sized piece of paper is 8.5” x 11”.

Part E: Short Essay Questions. For full credit, write using complete sentences and paragraphs. Only answer 2 out of 4 questions.

1. In your opinion, discuss the strengths and weaknesses of the Eclipse editor.
2. Why are classes and methods useful in software design?
3. What it unit testing and how can you set up a unit testing class with Eclipse?
4. What is refactoring? How can Eclipse help with refactoring?