CS1007: Object Oriented Design and Programming in Java

Midterm Study Outline

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Important

- Midterm Exam
  - open book and notes…in class
  - Study homework and class notes.
  - Covers first 4 chapters in book (little of 5), and anything covered in class.

Exam outline

- 6 - 10 definitions
- 6 theory questions
  - Will include basic theory
  - 2 programming related questions

Sample Definitions

- accessor method
- algorithm
- argument
- assignment
- binary
- boolean
- byte
- bytecode
- cast
- class
- class method
- class variable
- compiler
- constructor
- data type

- immutable
- implementation
- initialize
- instance
- instance variable
- instantiation
- local variable
- memory location
- method
- method invocation
- mutator method
- object
- object-oriented programming
- Overloading
- Overriding

More definitions

- parameter
- parameter passing
- portability
- Pseudocode
- polymorphism
- reference
- scope
- static
- syntax
- Variable
- Short
- Catch
- Exception
- Throw
- Run time error
- Javadoc
- consistency

- Container
- Component
- Java
- javac
- JVM
- encapsulation
- graphical user interface
- UML
- CRC Card
- Violet
- Abstract
- Unit testing
- Package
- Private
- Assert
- Graphics2D
- Final keyword

Sample theory questions

1. What is unit testing and how is it used?

2. What is the difference between a run time error and logical error ? And give an example of each

3. Given the task to write an email program, describe the analysis, design and implementation stage in brief, give concrete examples.

Theory questions continued

1. What is a sequence diagram and what is it good for? Give an example of a limitation of the sequence diagram

2. What is javadoc, and what is it useful for?

3. Why are different layout managers provided in java? Would it not be easier to simply provide an interface definition and allow the user to write their own?

Programming sample question 1/3

```
public class Exceptional {
    public static void main(String args[]) {
        int w,x,y,z;
        w = x = y = z = -1;
        try {
            int[] someData = {0, 6, 2, 3};
            int[] myArray = null;
            int[] noData = {};
            System.out.println("Test 1:");
            w = foo(myArray, 2);
            System.out.println("Test 2:");
            x = foo(someData, 3);
            System.out.println("Test 3:");
            y = foo(someData, 5);
            System.out.println("Test 4:");
            z = foo(noData, 0);
        } catch (Exception e) {
            System.out.println("Hmmm... what happened?");
        }
        System.out.println("w="+w + "  x="+x + "  y="+y + "  z="+z);
    }
```

2/3

```java
public static int foo(int[] a, int n) throws Exception {
    int result = 0;
    try {
        for (int i = 0; i < n; i++)
            result += a[i];
        result /= a.length;
    } catch (ArrayIndexOutOfBoundsException aioobe) {
        System.out.println("Oops!");
    } catch (NullPointerException npe) {
        System.out.println("Oh, my goodness!");
    } catch (ArithmeticException ae) {
        System.out.println("Bad news.");
        throw ae;
    } finally {
        System.out.println("result = " + result);
    }
    return result;
}
```

3/3

1. Provide the printed output that would result from executing the above program.

2. Suppose the line return result; was moved into the finally clause just after the println statement. Would the output be different? If so, write how it would differ. If not, explain why not.

Programming sample question 2

- Many games use a deck of cards to play. Using an object oriented approach, create a class in java to represent a a deck of card for a card game. Include as many useful methods as necessary for basic card operations.

Good Luck