CS 1331 Exam 1 Practice Questions

PRACTICE EXAM QUESTIONS

- Signing signifies you are aware of and in accordance with the **Academic Honor Code of Georgia Tech**.
- Calculators and cell phones are NOT allowed.
- This is an object-oriented programming test. Java is the required language. Java is case-sensitive. DO NOT WRITE IN ALL CAPS. A Java program in all caps will not compile. Good variable names and style are required. Comments are not required.

1. **True or False**

In each of the blanks below, write "T" if the statement beside the blank is true, "F" otherwise.

[1] (a) ____ This compiles: `String name = "George", "Burdell";`

[1] (b) ____ This compiles: `final boolean flag = (refCount == 0);`

[1] (c) ____ This compiles: `float num = (int) 20.5f + 123.55;`

[1] (d) ____ This compiles: `char letter = "hello".substring(0,0);`

[1] (e) ____ The default visibility given to instance variables that don't include explicit visibility modifers is `public`.

2. **Expression Evaluation**

For each expression below, write the value and then the Java data type of the evaluated legal expression in the space provided. Be exact. The type you give must be the **exact spelling of a Java primitive type including uppercase vs lowercase as it would appear in your program.**

Expression: `7 / 2`

[1] (a) Calculated value: _____

[1] (b) Java primitive type: _____

Expression: `64 - 16 * 2`

[1] (c) Calculated value: _____

[1] (d) Java primitive type: _____

Expression: `2.5f + 3.0 - 1.5f`

[1] (e) Calculated value: _____

[1] (f) Java primitive type: _____

3. **Multiple Choice** Circle the letter of the correct choice.

Given:

```
public class Kitten {

    private String name = "";

    public Kitten(String name) {
        name = name;
    }

    public String toString() {
        return "Kitten: " + name;
    }

    public boolean equals(Kitten other) {
        return this.name.equals(other.name);
    }
}
```

Assume the following statements have been executed:

```
Object maggie = new Kitten("Maggie");
Object fiona = new Kitten("Fiona");
Object fiona2 = new Kitten("Fiona");
```

[2] (a) What is the value of `maggie`?

A. null
B. the address of a `Kitten` object
C. automatically set to 0
D. undefined

[2] (b) What is printed on the console after the following statement is executed?

```
System.out.println(maggie.toString());
```

A. Kitten: Maggie
B. Kitten: null
C. Kitten:

[2] (c) In the statement `Kitten[] kittens = new Kitten[5];` , how many objects are created?

A. 0
B. 1
C. 5
D. 6

[2] (d) After executing `Kitten[] kittens = new Kitten[5];` , what is the value of `kittens[0]` ?

A. null
B. the address of a `Kitten` object
C. automatically set to 0
D. undefined

[2] (e) What is the value of the expression `fiona == fiona2`?

A. true
B. false

[10] 4. **Tracing**

Consider the following code:

```
import java.util.Random;

public class Greetings {

    private static final String[] GREETINGS = {"Hi", "Hello", "W'sup"};

    public static void main(String[] args) {
        Random rand = new Random();
        int greeting = rand.nextInt(GREETINGS.length);
        System.out.print(GREETINGS[greeting]);
        if (args.length > 0) { // What if we didn't include this check?
            System.out.print(", " + args[0]);
        }
        System.out.println("!");
    }
}
```

Assume the class `Greetings` has been compiled and you are at the command line in the directory containing `Greetings.class`.

[2] (a) What is printed (or might be printed) when you enter `java Greetings Earthlings` at the command line?

[2] (b) What is printed (or might be printed) when you enter `java Greetings` at the command line?

5. **Short Answer**

[2] (a) Write the header for the method you need to define in a class to make it executable from the command line.

[2] (b) Assume you are at the command line in the directory of the file that contains the definition for a Java class named `Foo`. Write the command that you would use to compile `Foo`.

[2] (c) If the command above executes successfully, what file will be produced?

[2] (d) Write the command that will execute the `Foo` class you compiled above.

[2] (e) Write a `for` loop whose index variable ranges from 1 to 10 and prints the squares of the numbers 1 through 10.

[2] (f) Complete the following code snippet with a `while` loop that that sets the boolean variable `found` to `true` if `42` is present in the array `numbers`. Assume `numbers` is delcared as `int[] numbers = new int[10]` and is initialized with 10 `int` values. Be sure not to trigger an `ArrayIndexOutOfBoundsException`.

```
boolean found = false;
```

6. **Complete the Method**

[2] (a) Write a private instance method named `contains` that takes two parameters, an `int[]` and an `int`, and returns `true` if the `int` argument to the method is contained in the `int[]` argument to the method, and `false` otherwise. Use a different loop from the one you used above.

[10] 7. Write a `Person` class with two properties: `firstName` and `lastName`. The two properties of `Person` instances must be encapsulated by the `Person` class and you must enforce the class invariants that `firstName` and `lastName` cannot be `null` or empty. An instance of `Person` may allow `lastName` or `firstName` to be changed. Your class should also include a way to print `String` representations of `Person` objects.