

CS 1316 - Exam 1 - Spring 2010**Your Grading TA:** _____ **Your Section :** _____

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Signature: _____

Problem	Points Earned	Points Possible	Grader Initials
1. Vocabulary		12	
2. Short Answer		7	
3. Turtle Graphics		8	
4. Code Understanding		8	
5. Multiple Choice		2	
6. Code Tracing		4	
7. Code Writing		14	
TOTAL:		55	

Exam Percentage: _____ / 55 = _____ %

1. Vocabulary (12 points)

For each of the following words, write a 1-2 sentence definition of the word as used in this class. Your definition should be concise and to the point, while demonstrating that you know what the term means.

a) block - A section of code, typically enclosed with curly brackets {} that makes up the body of a loop, function, or conditional.

b) class - The fundamental building block of Java programs, they act as the blueprints from which objects are constructed, including definitions of fields and methods.

c) private - A keyword that means that only methods within the object can access a particular field or method.

d) type declaration - The process of telling the compiler what type of data a variable will hold. e.g. `double t;`

2. Short Answers (7 points)

For each of the following questions, write a 1-4 sentence answer:

a. What is the difference between a constructor and a method?

A constructor is a unique method that is only called when a new instance of an object is created. A constructor must have the same name as the class, and may not have a return type specified. (2pts)

b. What is the point of declaring a field private and then declaring a public mutator (set method) that allows the public to change it? Why not just make the field public?

It allows you to hide the internal state from direct access by outsiders, and instead require that all accesses to the internal state be done through methods that can act as gatekeepers. This can be used (for example) to give different information at different times. (2pts)

c. What would the following math operations result in if run in the interactions pane? To signify that an answer is a Double include at least one decimal place. (1 pt each)

> 1/2 *Answer: 0*

> 10.0/5 *Answer: 2.0*

> (int) 2.5 * 2 *Answer: 4*

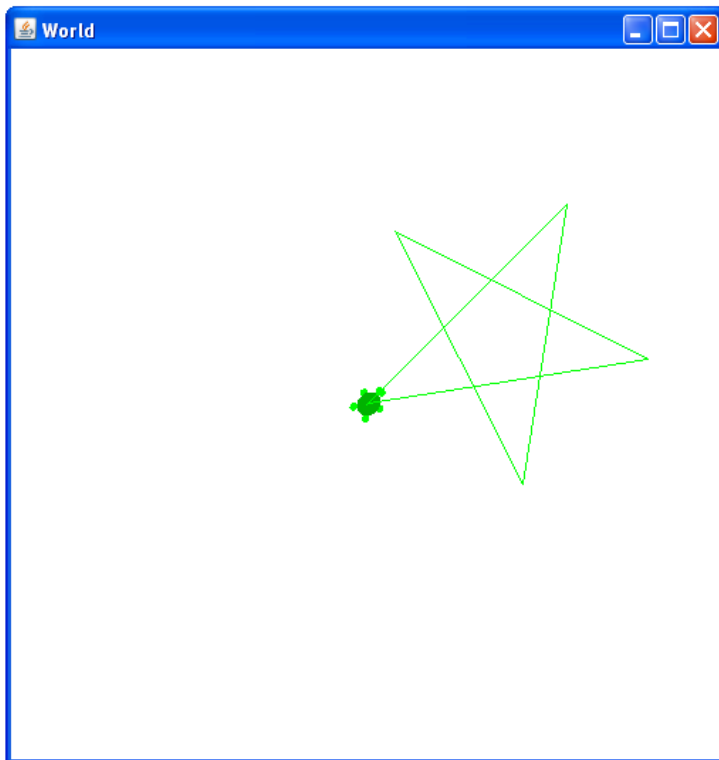
3. Turtle Graphics (8 Points)

Draw the image that results when this code is executed in the window below.

```
public class TurtleDrawing{
public static void main(String[]args){
    World w = new World (500,500);
    Turtle bert = new Turtle (w);
    bert.turn(45);
    for(int i = 1; i <=5; i++){
        bert.forward(200);
        bert.turn(144);
    }
}
}
```

Grading:

- + 1 - 45° angle for first line
- + 1 - Starting the turtle in the center
- + 2 - 5 sided figure
- + 2 - Turtle turns to the right each time
- + 2 - Output is comparable to correct solution



4. Code Understanding (8 Points)

```
public class Dog{
    public int size;
    public static String species = "Canine";

    public void bark(){
        if (size > 5){
            System.out.println("Bark!");
        }
        else {
            System.out.println("Yap yap yap");
        }
    }

    public static void growl(){
        System.out.println("Grrrrr");
    }
}
```

The above class Dog has been compiled. Assume a new Dog object has been instantiated as:

```
Dog clifford = new Dog();
clifford.size = 15;
```

-Circle the Java statement(s) below which would cause an error.

For each error, specify why the error would occur.

-For each statement that would NOT cause an error, write what would be printed!

System.out.println(clifford.species); + 1 - "Canine"

System.out.println(Dog.species); + 1 - "Canine"

clifford.bark(); + 1 - "Bark!"

Dog.bark();
+ 1 - Circled
+ 2 - Explanation: Object method cannot be called from a static context

clifford.growl(); + 1 - "Grrrrr"

Dog.growl(); + 1 - "Grrrrr"

5. Multiple Choice (2 points)

A subclass in Java may extend at most how many superclasses? (circle one)

- a.) None
- b.) One **Correct Answer**
- c.) Two
- d.) As many as the coder wishes, provided the syntax is correct.

6. Code Tracing (4 points)

What will be the output if the following code is executed?

```
int x = 4; int y = 2;

if( x < 7 || y < 2){
    System.out.println("Apple");
}
if(x > 3 && y > 2){
    System.out.println("Banana");
}
else if(x > 2 || y > 0){
    System.out.println("Cherry");
}
else if(x == 4){
    System.out.println("Date");
}
else{
    System.out.println("Finished");
}
```

Grading:

+ 2 for Apple

+ 2 for Cherry

- 2 for Each incorrect output

7. Code Writing (14 points)

Write a class called `CombineStrings` that contains a static method called `combine()` that accepts two Strings as parameters and returns a String that is the combination of the two input Strings *separated by a space*. Write a main method that calls the static method `combine()` and passes the Strings “hello” and “world” into the method. Print the resulting String from the `combine()` method to the interactions pane.

```
public class CombineStrings {  
  
    public static void main(String [] args) {  
        String s = CombineStrings.combine("hello", "world");  
        System.out.println(s);  
    }  
  
    public static String combine(String a, String b) {  
        return a + " " + b;  
    }  
  
}
```

Grading:

Class header

+ 1 - “public class CombineStrings”

Main method

+ 3 - “public”, “static”, “void” (in that order)

+ 1 - “main(String [] args)”

+ 1 - “System.out.println”

+ 1 - Calling combine method with Strings as two parameters

Combine method

+ 3 - “static”, “String”, “combine” (in that order)

+ 2 - Correct parameters, accepting two String

+ 1 - String correctly separated by a space

+ 1 - Returning a String