**Inheritance Game**

**Part I**

**ClassA.java**
```java
public class ClassA {
    public ClassA( String s ) {
        System.out.print( s + " ");
    }
}
```

**ClassB.java**
```java
public class ClassB extends ClassA {
    public ClassB( String s ) {
        super( s );
        System.out.print( "ClassB " + s );
    }

    public ClassB( int i ) {
        super( "" + i );
        System.out.println( "ClassB " + i );
    }
}
```

**Question 1 options:**
- a) foo
- b) ClassA foo
- c) ClassB foo
- d) ClassB 4 foo
- e) Compiler error

**Question 2 options:**
- a) foo
- b) ClassA foo
- c) ClassB foo
- d) ClassB 4 foo
- e) Compiler error

**Question 3 options:**
- a) foo
- b) foo ClassA foo
- c) foo ClassB foo
- d) ClassB 4 foo
- e) Compiler error

**Question 4 options:**
- a) foo ClassA foo
- b) foo ClassA 4
- c) 4 ClassB foo
- d) 4 ClassB 4
- e) Compiler error
Inheritance Game

Part II

**A.java**
class A {
    protected int x;

    public A() {
        x = 0;
        System.out.println("A Constructor(): "+x);
    }

    public A(int x) {
        this.x = x;
        System.out.println("A Constructor(int): "+x);
    }

    public void method1() {
        System.out.println("A's method1(): "+x);
    }

    public void method1(int i) {
        System.out.println("A's method1(int): "+x);
    }

    public void method2() {
        System.out.println("A's method2(): "+x);
    }
}

**B.java**
class B extends A {
    public B() {
        x = 2;
        System.out.println("B Constructor(): "+x);
    }

    public B(int x) {
        this.x = x;
        System.out.println("B Constructor(int): "+x);
    }

    public B(double x) {
        super((int)x);
        System.out.println("B Constructor(double): "+x);
    }

    public void method1(int i) {
        System.out.println("B's method1(int): "+x);
    }

    public void method2() {
        System.out.println("B's method2(): "+x);
    }
}
Inheritance Game

Directions: The first two pages get handed out to students, and contain the classes that the questions on the last two pages are based on. The first page (Game 1) contains 4 multiple choice questions, with the answers shown below the code. The questions are in bold below. Game 2 is on the second page, and the questions for it are on the last page. Again, the questions are in the form “What gets printed by the statement?”, with the answers in non-bold below the questions. There are questions worth between 100 and 400 points. The first question in each column must be done first, the latter ones assume that the first statement has executed immediately previously.

Game 1 – questions (each 200 pts)
What gets printed out when the statement is executed?

```java
ClassA a = new ClassA( "foo" );
a) foo 
b) ClassA foo
c) ClassB foo
d) ClassB 4 foo
e) Compiler error

Answer a
```

```java
ClassA a = new ClassA( 4 );
a) foo 
b) ClassA foo
c) ClassB foo
d) ClassB 4 foo
e) Compiler error

Answer e
```

```java
ClassA a = new ClassB( "foo" );
a) foo 
b) foo ClassA foo
c) foo ClassB foo
d) ClassB 4 foo
e) Compiler error

Answer c
```

```java
ClassA a = new ClassB( 4 );
a) foo ClassA foo 
b) foo ClassA 4
c) 4 ClassB foo
d) 4 ClassB 4
e) Compiler error

Answer d
```
Inheritance Game

Game 2 – questions (questions in bold), must be asked and interpreted in order..

100 pt questions

<table>
<thead>
<tr>
<th>100 pt questions</th>
<th>200 pt questions</th>
<th>300 pt questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A a = new A();</td>
<td>B b = new B();</td>
<td>A a = new B();</td>
</tr>
<tr>
<td>A Constructor(): 0</td>
<td>A Constructor(): 0</td>
<td>A Constructor(): 0</td>
</tr>
<tr>
<td>a.method1();</td>
<td>a.method1();</td>
<td>a.method1();</td>
</tr>
<tr>
<td>A's method1(): 0</td>
<td>A's method1(): 2</td>
<td>A's method1(): 2</td>
</tr>
<tr>
<td>a.method1(5);</td>
<td>a.method1(5);</td>
<td>a.method1(5);</td>
</tr>
<tr>
<td>a.method2();</td>
<td>a.method2();</td>
<td>a.method2();</td>
</tr>
<tr>
<td>A's method2(): 0</td>
<td>A's method2(): 2</td>
<td>A's method2(): 2</td>
</tr>
<tr>
<td>a = new A(10);</td>
<td>b = new B(10);</td>
<td>a = new B(10);</td>
</tr>
<tr>
<td>a.method1();</td>
<td>b.method1();</td>
<td>a.method1();</td>
</tr>
<tr>
<td>A's method1(): 10</td>
<td>A's method1(): 10</td>
<td>A's method1(): 10</td>
</tr>
<tr>
<td>a.method1(5);</td>
<td>b.method1(5);</td>
<td>a.method1(5);</td>
</tr>
<tr>
<td>a.method2();</td>
<td>b.method2();</td>
<td>a.method2();</td>
</tr>
<tr>
<td>A's method2(): 10</td>
<td>B's method2(): 10</td>
<td>A's method2(): 10</td>
</tr>
<tr>
<td>b = new B(15.0);</td>
<td>b = new B(15.0);</td>
<td>a = new B(15.0);</td>
</tr>
<tr>
<td>B Constructor(double): 15.0</td>
<td>B Constructor(double): 15.0</td>
<td>B Constructor(double): 15.0</td>
</tr>
<tr>
<td>b.method1();</td>
<td>a.method1();</td>
<td>b.method1();</td>
</tr>
<tr>
<td>A's method1(): 15</td>
<td>A's method1(): 15</td>
<td>A's method1(): 15</td>
</tr>
<tr>
<td>b.method1(5);</td>
<td>a.method1(5);</td>
<td>b.method1(5);</td>
</tr>
<tr>
<td>b.method2();</td>
<td>a.method2();</td>
<td>b.method2();</td>
</tr>
<tr>
<td>B's method2(): 15</td>
<td>B's method2(): 15</td>
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</tr>
</tbody>
</table>

Game 2 – 400 pt questions

X is a protected data member of superclass Y which inherits from Object. Is it accessible from subclass Z where Z inherits from W, and W is a direct subclass of Object? (hint: drawing out the class hierarchy may be helpful)  No

X is a protected data member of subclass Y and Y inherits from Z. Can Z access X? Why or why not? No, protected data members are not accessible to the superclass.

When you instantiate an object of a subclass, is the superclass constructor called even though super() is not specified?  yes, or its an error

If so, when is the superclass constructor called?  It must be called first if it's not called explicitly.

Assume a superclass has only one parameterized constructor. What happens when the subclass constructor doesn't call super()? Compiler error

What happens when the subclass constructor calls super() (without a parameter)?  Compiler error