

CS 211 Summer 2007, Review problem set #4

1. Determine the output of the following Java program.

```
public class Problem4 {
    public static void main(String[] args) {
        A r1 = new B(1);
        A r2 = new C();
        B r3 = (B) r2;
        System.out.println(r3.y);
        I1 r4 = new C();
        // r4.print(1,2);
    }
}

abstract class A {
    public int x = 3;
    public int y = x;
    public A() { print(x+2); }
    public void print() { System.out.println(x); }
    public void print(int x) { print(); }
}

class B extends A {
    public int y = x;
    public B(int x) { x = this.x; print(x+3); }
    public B() { }
    public void print() { super.print(); }
    public void print(int x) { System.out.println(x+1); }
    private void print(int x, int y) { print(x*y); }
}

class C extends B implements I1 {
    C() { super(3); }
    public void print(int x, int y) { print(x-y); }
    public void m1() { }
}

interface I1 { }
```

6 7 6 7 3 6 7

2. In the source code above, would removing the `//` in front of the line `r4.print(1,2);` cause an error?

Yes, it causes a compiler error. There's no `print()` method declared in interface `I1`.

3. Consider the following class declarations:

```
interface I1 {...}
interface I2 {...}
interface I3 extends I1 {...}
class C1 implements I1 {...}
class C2 implements I2 {...}
class C3 implements I3 {...}
class C4 extends C3 implements I2 {...}
```

For each of the following snippets of Java code, determine whether the code will produce no error, a run-time error, or a compile-time error. (Assume that each snippet is tested independently of the others.)

- (a) `I2 a = new I2();` Compiler error
- (b) `I2 b = new C2();` No error
- (c) `C3 c = new C4();` No error
- (d) `C2 d = new C4();` Compiler error
- (e) `C4 e = new C3();` Compiler error
- (f) `C4 f = (C4)(new C3());` Runtime exception
- (g) No error
`I1 g1 = new C1();`
`C4 g2 = new C4();`
`g1 = g2;`
- (h) Compiler error
`I1 g1 = new C4();`
`I2 g2 = new C2();`
`g2 = g1;`