Object-Oriented Programming
academic year 2010-11

Rules

- This is a closed books exam.
- The operation of any electronic device is prohibited (e.g. no calculator, phone or PDA).
- Answer the questions being *precise*, *complete*, and *formal*.
- Write as *clearly* as possible, both in terms of handwriting and wording.

Questions

1. What is the difference between pass by value and pass by reference?

2. What are this and super keywords? What are they used for?

3. What will be the output of the following program:

```java
public class A extends B {
    public A() {
        super(null);
        System.out.println("A()");
    }

    public static void main(String[] args) {
        new A();
    }
}

class B extends D {
    public B(D d) {
        super(new D(d));
        System.out.println("B(D)");
    }

    public B() {
        System.out.println("B()");
    }
}

class C extends D {}

class D {
    public D(D a) {
        new B();
        System.out.println("D(D)");
    }

    public D() {
        System.out.println("D()");
    }
}
```

4. What will be the output of the following program:

```java
public class X {
  public void doIt (Y y) { System.out.println("X: Y invoked"); }
  public void doIt (Z z) { System.out.println("X: Z invoked"); }

  public static void main(String[] args) {
      X x1 = new X();
      X x2 = new P();
```

```java
        P x3 = new P();

        Y y1 = new Y();
        Y y2 = new Z();
        Z y3 = new Z();

        x1.doIt(y1);
        x2.doIt(y1);
        x3.doIt(y1);

        x1.doIt(y2);
        x2.doIt(y2);
        x3.doIt(y2);

        x1.doIt(y3);
        x2.doIt(y3);
        x3.doIt(y3);
    }
}
class P extends X {
    public void doIt (Z z) { System.out.println("P: Z invoked"); }
}
class Y {}
class Z extends Y {}
```

5. There are compilation errors in 6 lines in the following code. Provide numbers of these lines with a description of corresponding errors as an answer.

```java
public final class Q {
    int doIt(byte x) {
        x = x + x
    }
}

public class G extends Q {
    int doIt(int y) {
        super(y);
        return 2;
    }

    int x = 0;
    x++;
}
```

6. What are the coding standards for naming variables, constants, methods and classes?

7. What is purpose of serialVersionUID?

8. Describe the *Proxy* pattern. Why and when it is used? What examples of Proxy do you know within Java API?

9. Describe the *Parallel* garbage collector. When is it recommended to use it?