

Midterm Examination #2

CSE 11, UCSD

Practice

RULES:

1. Don't start the exam until you are told to.
2. This is a closed-book, closed-notes, no-calculator exam. Don't refer to any materials other than the exam itself.
3. Write your name, AND your cs11 login name, on each page of the exam when you get to it.
4. Do not look at anyone else's exam. Do not talk to anyone but an exam proctor during the exam.
5. If you're wearing a billed cap, turn it so the bill is facing back, or take it off. Please turn off cell phones and pagers.
6. If you have a question, raise your hand and an exam proctor will come to you.
7. You have 1 hour and 15 minutes to finish the exam. When you are done, give your exam to a proctor. The proctor will check your picture ID and sign the ID check below.
8. Your exam grade will be emailed to your cs11 account within 2 working days. Exams will be handed back in discussion sessions next week.

| # | Topic | max pts | actual pts |
|----|-------------|---------|------------|
| 1. | General T/F | 24 | |
| 2. | General F/B | 24 | |
| 3. | Loops | 12 | |
| 4. | Inheritance | 28 | |
| 5. | Ctors | 12 | |
| | TOTAL | 100 | |

grader:_____

PROCTOR ID CHECK:_____

1. [24 pts; 1 pt each correct answer; -1 pt each incorrect answer] True or False:
- a. _____ In Java boolean expressions, the Object pointer value `null` is equivalent to `false`.
 - b. _____ When called, a public instance method of an object can access private instance variables of that object.
 - c. _____ If not overridden, public methods of a base class become public methods of a derived class.
 - d. _____ In Java, the type `Boolean` is a subclass of `Object`.
 - e. _____ If you want a method to return a value, you must put a “return” statement somewhere in it.
 - f. _____ Constructors are inherited.
 - g. _____ A constructor of a class must never be declared to return `void`.
 - h. _____ It is impossible for a Java class to have more than one parent class.
 - i. _____ To perform an iteration until a complicated boolean condition becomes false, it is usually better to use a `for` statement than a `while` statement.
 - j. _____ Overloading a method means defining a method to have the same name but a different number or type of arguments.
 - k. _____ If you do not first use the `setLayout()` method to specify a layout manager, no components can be added to a Swing container.
 - l. _____ A constructor method for a class is called when a variable of that class type is declared.
 - m. _____ A variable declared in the “init” part of a for-loop is visible within that for-loop only.
 - n. _____ “Instance of a class” and “object of a class” mean the same thing.
 - o. _____ The `BorderLayout` layout manager for a container will resize components if the container is resized.
 - p. _____ In Java, a class may implement any number of interfaces.
 - q. _____ If you attempt to use a `DataInputStream` object to access a text file, an `IOException` will be thrown.
 - r. _____ Java uses dynamic binding to determine which version of an overridden method will be called.
 - s. _____ In a JFC component, x coordinates increase going to the right, and y coordinates increase going downward.
 - t. _____ As a programmer, to understand how to use a class, you should read the documentation of what the public methods of the class do.
 - u. _____ Java primitive type values are automatically copied when passed as arguments to methods.
 - v. _____ A feature of the exception handling mechanisms in Java is that they let the programmer separate the tasks of handling normal cases and handling exceptional cases.
 - w. _____ Literal constants of type `String` can be used as case labels in a Java switch statement.
 - x. _____ Every Java while-loop can be re-written as a for-loop that does exactly the same thing.
-

2. [21 pts, 3pts ea blank] Fill in the blank with the best word or words that completes the sentence.
- a. _____ is the acquisition by one class of the variables and methods of another class.
 - b. The Java class that is not a subclass of any other class is _____.
 - c. A(n) _____ is the AWT component class used for doing general graphics.
 - d. If a method definition is declared _____, it can be called using just the class name, without creating an object.
 - e. A constructor with no arguments is called a(n) _____ constructor.
 - f. If a class is declared _____ in its definition, the class cannot be used as a base class.
 - g. The style of programming in which user interactions with GUI objects determine the flow of execution in your program is called _____ programming.
 - h. A class defined within the body of another class definition is called a(n) _____ class.

3. [12 pts, 3pts ea blank] For each of the following, write down the number of lines printed, and the largest number printed. (There are no infinite loops or syntax errors in these examples.)

a.

```
for(int i=0; i<10; i++) {  
    for(int j=0; j<100; j++) {  
        if(j==41) continue;  
        System.out.println(j);  
    }  
}
```

Number of lines printed: _____ Largest number printed: _____

b.

```
int n=10;  
try {  
    while (n < 50) {  
        if(n == 27) throw new Exception();  
        System.out.println(n);  
        n = n + 3;  
    }  
} catch (Exception e) {  
    System.out.println(n);  
}
```

Number of lines printed: _____ Largest number printed: _____

4. [28 pts; 4 pts each] Consider these Java class definitions:

```
-----  
public class X {  
    private int a;  
    private double b;  
    public X () { a = 1; b = 2; }  
    public X ( int num1, int num2 ) { a = num1; b = num2; }  
    public double getVal () { return b; }  
    public double getOtherVal (X x) { return x.getVal(); }  
}  
-----  
public class Y extends X {  
    public int c;  
    public Y ( int num ) { c = num; }  
    public double getVal () { return c; }  
    public int amount (X x) { return (int)(getOtherVal(x) + 7); }  
}  
-----
```

Now consider the marked statements in the Java code below. For each one, write down what would be printed when the statement executes; or write "ERROR" if the statement would cause a compile-time or runtime error.

```
public class Tester {  
    public static void main ( String[] args ) {  
  
        X x_obj1 = new X(5,6);  
        X x_obj2 = new X(-4,-5);  
        Y x_obj3 = new Y(2);
```

- a. _____ System.out.println(x_obj3.c);
- b. _____ System.out.println(x_obj1.getVal());
- c. _____ System.out.println(x_obj3.getVal());
- d. _____ System.out.println(x_obj3.getOtherVal(x_obj2));
- e. _____ System.out.println(x_obj2.getOtherVal(x_obj3));
- f. _____ System.out.println(x_obj2.amount(x_obj3));
- g. _____ System.out.println(x_obj3.amount(x_obj2));

5. [12 pts; 3pts each correct answer, -3pts each incorrect answer] Consider the following code:

```
-----  
public class A {  
    private int x;  
    public A () { ??? }  
    public A (int x) { ??? }  
}
```

```
-----  
public class B extends A {  
    public B () { ??? }  
    public B (int x) { ??? }  
}
```

```
-----  
public class Program {  
public static void main ( String args[] ) {  
    A a_obj = new A(4);  
    a_obj = new A();  
    B b_obj = new B();  
    b_obj = new B(6);  
}  
}
```

When Program's main() method is executed, the following four numbers (and nothing else) are printed out on separate lines: first 4, then 6, then 4, and finally 6.

For each of the following definitions for the constructors, write "YES" if they work as required, else "NO".

- a._____ `public A () {}
public A (int x) {System.out.println(x);}
public B() {super(6);}
public B(int x) {super(x-2); System.out.println(x);}`
- b._____ `public A () { System.out.println(x);}
public A (int x) {this.x = x+2; System.out.println(x); }
public B () {super(4); }
public B (int x) { System.out.println(x); }`
- c._____ `public A () {System.out.println(6);}
public A (int x) {System.out.println(x);}
public B() {System.out.println(4);}
public B(int x) {System.out.println(x);}`
- d._____ `public A () {System.out.println(x+2);}
public A (int x) {this.x = x; }
public B() {System.out.println(4);}
public B(int x) {super(x);}`