

Exam 2  
Computer Programming 230  
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**Exam Rules**

- Show all your work. Your grade will be based on the work shown.
- The exam is closed book and closed notes.
- When taking the exam, you may have with you pens or pencils, and an 8 1/2" x 11" piece of paper filled with notes, programs, etc.
- You may not use a computer or calculator.
- All books and bags must be left at the front of the classroom during this exam.
- **Do not open this exams until instructed to do so.**

Question 1	
Question 2	
Question 3	
Question 4	
Question 5	
Question 6	
Question 7	
Question 8	
Question 9	
Question 10	
TOTAL	

1. True or False:

- (a) \_\_\_ In Alice, there is an event that is processed as long as the world is running.
- (b) \_\_\_ In Alice, an event can execute its statements only once.
- (c) \_\_\_ An array is the only data structure available in Alice.
- (d) \_\_\_ In Alice, it is not possible to have lists of objects.
- (e) \_\_\_ A constructor is a method that creates a new object.
- (f) \_\_\_ A new class can be derived from an existing one.
- (g) \_\_\_ In Java, a variable can be used before it is declared.
- (h) \_\_\_ In Java, GUI components cannot contain other components.
- (i) \_\_\_ To generate a keyboard event, a component must have the keyboard focus.
- (j) \_\_\_ In Java, every event has a related listener interface.

2. (a) What is an event? Give an example.

(b) What is a listener in Java? Give an example.

3. Write the Alice code that would make the items in a list, called **Ballerinas**, turn in place 3 times and jump, in unison:

4. Answer the questions below, based on the following code:

#### Events

When the world starts
Do: world.my first method

  

When world.mooTime changes
Do: cow play sound cow.moo (0:01.567)

#### Methods

world.my first method ( )
No variables
// Mooing Cow.a2w
Wait 0.5 seconds
While ( world.secondsSinceStart < 11 )
Do together
cow.tailSwish times = 2 speed = 2
time sign set text to ( world.secondsSinceStart as a string )
increment world.secondsSinceStart by 1
Wait 1 second
world.mooTime set value to true
Do together
cow.headTurn
cow.openJaw

- What happens when the world starts?

- What does the other event do?

5. Line up the Alice statements with the corresponding statement in Java:

A

B

C

D

E

I world.drawCircle(x,y);

II if ( count < 10 )  
done = false;

III world.drawCircle();

IV if ( count < 10 )  
done = false;  
else  
done = true;

V name = Integer.toString(count);

6. To the right of each line of code, indicate the values stored in the variables immediately after those lines have been executed. If a variable is uninitialized, enter ? in the box for that variable.

(a) `int x, y, z;`  
`String a, b;`

`x = 5;`

x	y	z	a	b

(b) `y = x/5;`

x	y	z	a	b

(c) `a = "Hi";`

x	y	z	a	b

(d) `b = a+a;`

x	y	z	a	b

(e) `z = x*x+1;`

x	y	z	a	b

(f) `a = "23";`

x	y	z	a	b

(g) `y = Integer.parseInt(a);`

x	y	z	a	b

(h) `x = y--;`

x	y	z	a	b

(i) `a = z % x;`

x	y	z	a	b

(j) `x--;`

x	y	z	a	b

7. Fill in the missing methods below:

```
//*****
// Circle.java      Programming with Alice and Java
//
// Represents a circle with a particular size, color, and location. The
// circle can be drawn filled or unfilled.
//*****
import java.awt.*;
public class Circle
{
    private int radius;
    private Color color;
    private int x, y; // the circle's center point
    //-----
    // Sets up the circle with the specified location, size, and color.
    //-----
    public Circle(int xCenter, int yCenter, int size, Color circleColor)
    {

    }

    //-----
    // Draws the circle, filled, in the specified graphics context.
    //-----
    public void drawFilled(Graphics gc)
    {

    }

}
}
```

8. Write the constructor for the `PushCounterPanel`. The `count` should be initialized to 0, the button should have the title, `Push me!`, and should have an associated listener from the class, `ButtonListener`. Also, add the button and label so they appear on the panel and set the background color for the panel.

```
import java.awt.*;
import javax.swing.*;
import java.awt.event.*;
public class PushCounterPanel extends JPanel
{
    private int count;
    private JLabel label;
    private JButton push;
    //-----
    // Sets up the interface on the panel.
    //-----
    public PushCounterPanel()
    {
```

```
    }
    //-----
    // Increments the counter and updates the label accordingly.
    //-----
    public void incrementCount()
    {
        count++;
        label.setText("Pushes: " + count);
    }
}
```

9. Write a complete Alice program that has 5 bugs moving in random directions. When a bug is clicked with the mouse, it disappears from view.

world.my first method:

Events:

10. Write a **complete** Java program that prints `Hello World` to the console: