

SAMPLE EXAM  
Exam 2  
Computer Programming 230  
Dr. St. John  
Lehman College  
City University of New York  
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NAME (Printed) \_\_\_\_\_  
NAME (Signed) \_\_\_\_\_  
E-mail \_\_\_\_\_

**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, an event may occur only as a result of user action.
- (b) \_\_\_ In Java, an event may occur only as a result of user action.
- (c) \_\_\_ A list and an array are both linear data structures.
- (d) \_\_\_ An index in the array always starts with 1.
- (e) \_\_\_ In Alice, an array data structure is more efficient than a list.
- (f) \_\_\_ Some methods in Java are called automatically.
- (g) \_\_\_ If the program contains a group of check boxes, only one can be checked.
- (h) \_\_\_ In Java, An object that responds when the event occurs is called a listener.
- (i) \_\_\_ In Java, the events `mouseMoved` and `mouseDragged` events are identical.
- (j) \_\_\_ To generate a keyboard event in Java, a component must have the keyboard focus.

2. (a) What is a component in Java? Given an example.

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

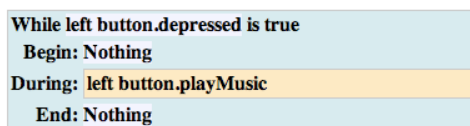
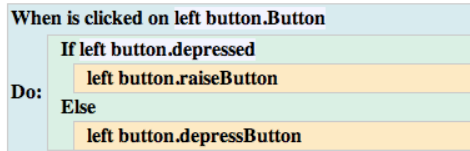
3. Write the Alice code that would make the items in a list, called **Dominoes**, fall over, one after another:

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

- What happens when the world starts?

## world

### Events



- What do the other events do?

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

A	random set value to random number minimum = 0 maximum = 5 integerOnly = true	I world.drawCircle(radius);
B	random set value to random number minimum = 0 maximum = 5 integerOnly = false	II world.drawCircle();
C	world.drawCircle	III world.drawCircle(x,y);
D	world.drawCircle x = 1 y = 1	IV private Random random; random = rand.nextInt(5);
E	world.drawCircle radius = 1	V private Random random; random = rand.nextFloat(5);

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 = 10;`

x	y	z	a	b

(b) `y = x-1;`

x	y	z	a	b

(c) `a = "R "+x;`

x	y	z	a	b

(d) `b = a+a;`

x	y	z	a	b

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

x	y	z	a	b

(f) `a = "100";`

x	y	z	a	b

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

x	y	z	a	b

(h) `x = y/5;`

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:

```
//*****
//  Square.java          Programming with Alice and Java
//
//  Represents a square with a particular size, color, and location. The
//  circle can be drawn filled.
//*****
import java.awt.*;
public class Square
{
    private int side;
    private Color color;
    private int x, y; // the square's upper left coner
    //-----
    //  Sets up the square with the specified location, size, and color.
    //-----
    public Square(int xCenter, int yCenter, int size, Color circleColor)
    {

    }

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

    }

}
}
```

8. Set up the constructor and listener for the `ColorPanel` program. The constructor should set up the preferred dimensions of the panel, set keyboard focus, and add the listener. The listener should change the panel color to red if the 'r' key is pressed, and turn the color to green if the 'g' key is pressed.

```
import java.awt.*;
import java.util.*;
import javax.swing.*;
import java.awt.event.*;
public class ColorPanel extends JPanel
{
    public ColorPanel()
    {

    }

    public void paintComponent(Graphics gc)
    {
        super.paintComponent(gc);
        gc.drawImage(currentImage, 0, 0, null);
    }

    private class KeyboardListener implements KeyListener
    {
        //-----
        //  Switches the background color based on the key pressed.
        //-----
        public void keyPressed(KeyEvent event)
        {

        }

        public void keyReleased(KeyEvent event) { }
        public void keyTyped(KeyEvent event) { }
    }
}
```

9. Write a complete Alice program that has 5 airplanes circling in the air, in unison. When one is clicked with the mouse, it disappears from view.

`world.my first method:`

`Events:`

10. Write a **complete** Java program that prints I love Java! to the console: