



CS 101 - Problem Solving and Structured Programming Sample Midterm Questions

In addition to the questions here, you will probably find it helpful to look at the non-programming questions in the textbook.

1. Declare variables to hold the following information:
 - a. An instance variable to hold the number of students in a class
 - b. A local variable to hold your age
 - c. A local variable to hold a rectangle that has a solid color
 - d. An instance variable to hold your GPA
 - e. An instance variable to hold whether you like anchovies or not

2. A beginning programmer is trying to write code to print out the even numbers starting with 2 and ending with 100. She is considering the 3 alternatives shown below. All of the code compiles, but she is unsure which will work. You can assume that all the text items displayed will be visible, that is, that the window is large enough and that they do not obscure each other.
 - a. Which is correct? (There may be more than 1 that is correct.)
 - i.

```
int counter = 0;
while (counter <= 100)
{
    counter := counter + 2;
    new Text ((counter + "is an even number"), 10, 10 * counter, canvas);
}
```
 - ii.

```
int counter = 0;
while (counter < 100)
{
    counter = counter + 2;
    new Text ((counter + "is an even number"), 10, 10 * counter, canvas);
}
```
 - iii.

```
int counter = 2;
while (counter <= 100)
{
    new Text ((counter + "is an even number"), 10, 10 * counter, canvas);
    counter = counter + 2;
}
```
 - b. Please explain what the incorrect code does. (There may be more than 1 that is incorrect.)

3. Write a declaration for a public method `onDoubleClick`, which should take as a parameter the point where the user performs the double click. Like the familiar


```

public class DragOneShape extends FrameWindowController
{
    private FilledRect rect1;
    private FilledRect rect2;
    private Location lastPoint;
    private boolean rect1Selected = false;
    private boolean rect2Selected = false;

    public void begin() {
        rect1 = new FilledRect (10, 10, 30, 30, canvas);
        rect2 = new FilledRect (50, 50, 30, 30, canvas);
    }

    public void onMousePress (Location point) {
        if (rect1.contains (point)) {
            rect1Selected = true;
        }
        if (rect2.contains (point)) {
            rect2Selected = true;
        }
        lastPoint = point;
    }

    public void onMouseDrag (Location point) {
        double dx = point.getX() - lastPoint.getX();
        double dy = point.getY() - lastPoint.getY();
        if (rect1Selected) {
            rect1.move (dx, dy);
        }
        if (rect2Selected) {
            rect2.move (dx, dy);
        }
        lastPoint = point;
    }

    public void onMouseRelease (Location point) {
        if (rect1Selected) {
            rect1Selected = false;
        }
        else if (rect2Selected) {
            rect2Selected = false;
        }
    }
}

```

6. What will be displayed if the code below is executed?

```
x = 18;
if (x < 20)
{
    new Text("little x", 10, 10, canvas);
}
else if (x > 15)
{
    new Text("big x", 10, 50, canvas)
}
```