EECE.3220: Data Structures

Spring 2017

Lecture 13: Key Questions
February 22, 2017

1. Describe the different types of class relationships. Focus on composition, as demonstrated by the Point and Rectangle classes defined on the next page.

2. Describe how data members of an object must be set if that object is inside another object.

```
// Point definition, taken from Point.h
class Point {
public:
   Point();                     // Default constructor
   Point(double X, double Y);  // Parameterized constructor
   void setX(double newX);     // Set X coordinate
   void setY(double newY);     // Set Y coordinate
   double getX();              // Returns X coordinate
   double getY();              // Returns Y coordinate
   void printPoint(ostream &out);   // Output Point as
                                    //  (xCoord, yCoord)
private:
   double xCoord;         // X coordinate
   double yCoord;         // Y coordinate
};

// Rectangle definition, taken from Rectangle.h
class Rectangle {
public:
   Rectangle();                // Default constructor
   // Parameterized constructor
   Rectangle(double h, double w, double x, double y);
   double getHeight();    // Return height
   double getWidth();     // Return width
   Point getOrigin();     // Return origin
   void setHeight(double h);   // Change height
   void setWidth(double w);    // Change width
   void setOrigin(Point p);    // Change origin
   double area();    // Return area of rectangle
private:
   double width;
   double height;
   Point origin;     // Lower left corner
};
```

3. **Example:** Write code for each of the following functions:

a. `Point Rectangle::getOrigin() {`

`}`

b. `void Rectangle::setOrigin(Point p) {`

`}`

4. Describe the purpose of an initialization list.

5. Rewrite the `Rectangle` default constructor to use an initialization list.

6. Write a parameterized constructor for the `Rectangle` class that takes four arguments: height (`h`), width (`w`), and the X and Y coordinates of the origin (`x`, `y`).