**CMSI 4072 HW 2**

1. What's the difference between a component-based architecture and a service-oriented architecture?
   1. Component-based: The system is regarded as a group of components which provide services for each other. The individual components can work together for a greater task.
   2. Service-oriented: The system is still composed of components, however, in this scenario the components provide services for clints. Rather than assisting other internal components of the system, the services are completed over the internet in one such scenario.
2. Suppose you're building a phone application that lets you play tic-tac-toe against a simple computer opponent. It will display high scores stored on the phone, not in an external database. Which architectures would be most appropriate and why?
   1. A component-based architecture would be more appropriate as there is no need to provide the service over the internet when the high score data is stored locally on the phone. Simply having one component check the high score for another component would be simpler and likely faster than performing the check alternatively.
3. Repeat question 3 [after thinking about it; it repeats question 2 for a chess game] assuming the chess program lets two users play against each other over an Internet connection.
   1. A service-oriented architecture would be more appropriate here as the game takes place over the internet and it would not make sense to use a component-based architecture.
4. What kind of database structure and maintenance should the ClassyDraw application use?
   1. An audit trial structure would work well, as it keeps track of the modifications a user makes to a drawing. This would allow simpler implementation of important tools like undo and redo. The best maintenance would be a cloud, as it would allow users to store their drawings, and additionally the expandability of a cloud system means that users can store drawings of whatever size and as many as they like.
5. Draw a state machine diagram to let a program read floating point numbers in scientific notation as in +37 or -12.3e+17 (which means -12.3 x 1017). Allow both E and e for the exponent symbol. [Jeez, is this like Dr. Dorin's DFAs, or what???]

Input is 0-9

Input is e or E

Input is 0-9

Input is .

Input is 0-9

1. Consider the ClassyDraw classes Line, Rectangle, Ellipse, Star, and Text. What properties do these classes all share? What properties do they not share? Are there any properties shared by some classes and not others? Where should the shared and nonshared properties be implemented?
   1. All shapes (Rectangle, Ellipse, Star) would share a fill method, however Line and Text would not. On the other hand, all classes would share an outline method. A way to implement this would be to have a Drawable parent class with methods like outline, but also have a shapes class as a middle-man between Drawable and the above mentioned shapes such that Line and Text would not inherit a fill property.
2. Draw an inheritance diagram showing the properties you identified for Exercise 1. (Create parent classes as needed, and don't forget the Drawable class at the top.)

**Rectangle**PointIsAt()

**Ellipse**PointIsAt()

**Star**  
PointIsAt()

**Drawable**  
Outline()  
PointIsAt()

**Shape**Fill()

Line

Text