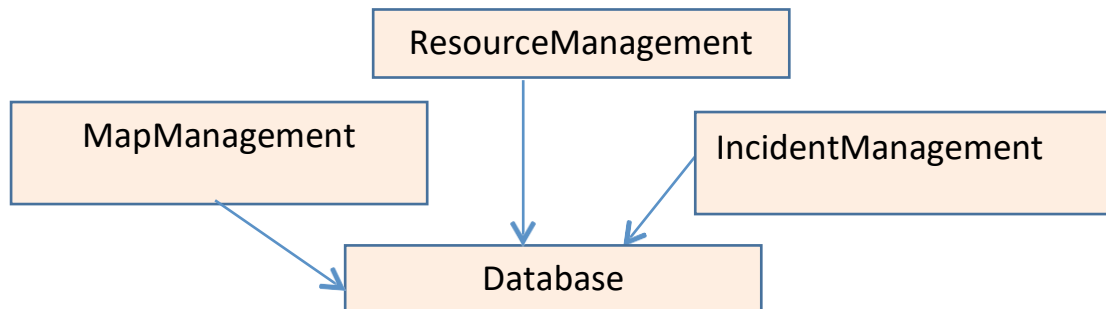


ISYS1083/1084 Object-Oriented Software Design

TuteLab01 SOLID Principles:

Tutorial Questions

- 1(a) What is design? Why is it important?
- b) Counter the claim “*In an increasingly agile world developers need not spend much time in upfront design*” with your own arguments.
- 2a) Which of the following two statements are true?
- Coupling is the measure of dependencies between modules
- Cohesion is the measure of dependencies within a module.
- b) Consider the design of the emergency response system below where three subsystems directly access the Database subsystem. Identify one main problem with this design and suggest an improvement.



- c) Assume that you are developing an application using JavaFX or AWT/Swing on a Windows platform. Describe using a suitable UML diagram(s) how your chosen class design shields programmers from directly accessing low level Windows drawing facilities and can be easily ported to a Mac.
3. Please study the program below and identify which OO principle has been violated explaining why. Redesign the classes without violating that principle.

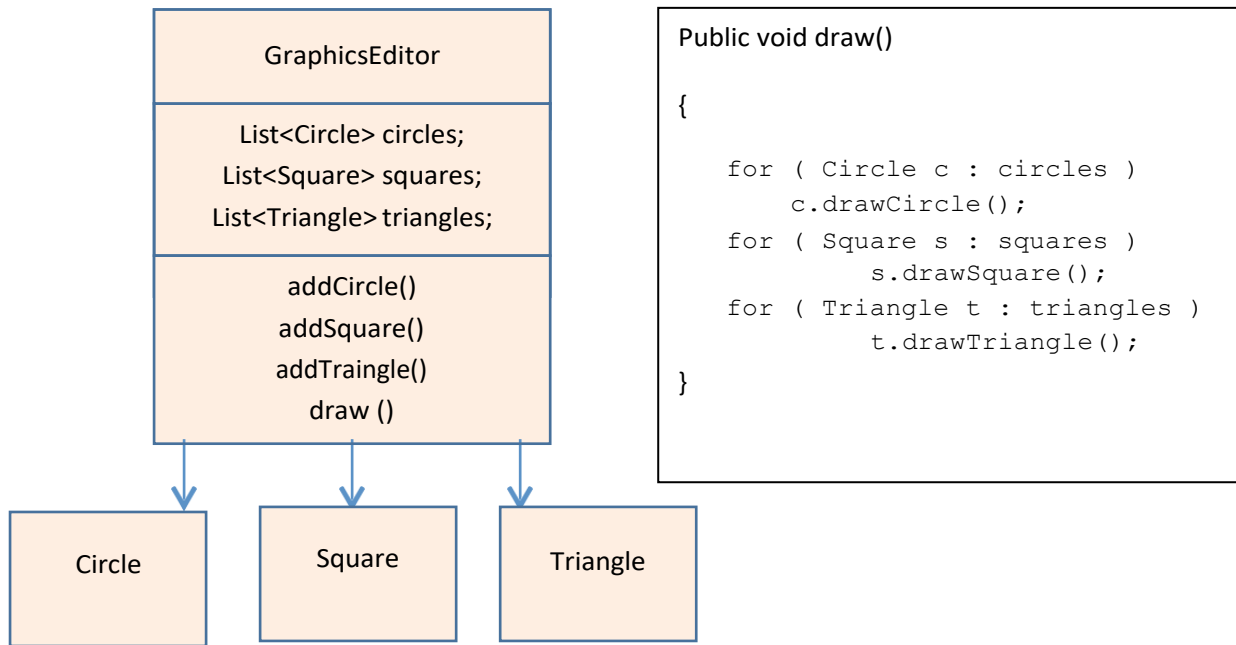
```
class Bird
{
    public void eat() {...}
    public void fly() {...}
    public void sleep() {...}
}
class Parrot extends Bird { ... }
class Penguin extends Bird { ... }
class Crow extends Bird { ... }
class BirdTest
{
    Public static void main(String[] args)
    {
        List<Bird> birdList = new ArrayList<Bird>();
        birdList.add(new Crow());
        birdList.add(new Penguin());
    }
}
```

```

        birdList.add(new Parrot());
        for ( Bird b : birdList )
            b.fly();
    }
}

```

3. Explain why the following design for a graphics editor violates the Open Closed principle.



- 4 a) What does the term pattern mean in the context of software development?
- b) How do patterns help the software developer? (think vocabulary etc.)
- c) Briefly explain the benefits of the Model View Controller Pattern (assuming you are already familiar with this pattern which is covered further in the next topic)