Inheritance

Monday, 22 January 2018 11:04 PM

Method Overriding

- Write in subclass (same signature as super class)
- OO polymorphism

Overloading

- Same method name, but different signature

Type Casting

- Java is strongly typed

```
Object o1 = new Circle(new Point(0,0), 10);
```

- Can be casted into Circle since o1 is an instance of Circle

Java Packages

```
java.util.Scanner
java.lang.Math
```

Access modifiers

- No modifier --> package-private

Access Modifier	Class	Package	Subclass	World
public	Y	Y	Y	Y
protected	Y	Y	Y	N
no modifier	Y	Y	N	N
private	Y	N	N	N

Has-A Relationship

- Model with composition
- Building complex classes with many fields

Forwarding

- Calls to methods gets forwarded to constituent classes

Is-A Relationship

- Subtype with additional behaviours

Liskov Substitution Principle

- All properties of T (super) must be properties of S (sub)
- T can always be replaced by S without changing property
    - E.g. Violated with resizeTo for Rectangle and Square

Preventing Inheritance and Method Overriding

```
final class Circle {...}

final public methodName() {...}
```

Abstract Classes

- Concrete class > Abstract class > Interface

```
abstract class PaintedShape {...}
```

Interfaces with Default Methods

```
default public methodName() {...}
```

Exercises

2. Yes. The property of FormattedText to be underlined is not true for URL
    - Even though URL is-a FormattedText
3. Concepts: inheritance, polymorphism
    - Part C, Line 16-17: a executes the f() of class B (polymorphism)
    - Part D, Line 15 and 17: StackOverflowError
    - Part E, Line 8: Compile error, f() in B cannot override f() in A
        - Return type not part of method signature, cannot be repeated
    - Part F, Line 10: Compile error, unexpected return value
    - Part G, Line 15: Polymorphism, Line 16: Inheritance
    - Part H, Line 15: Error, f() has private access in A
    - Part I, Line 8: Compile error, f() in B cannot override f() in A
        - Overridden method is static
    - Part J: Static methods cannot be overridden
    - Park K/ L: Line 6: Compile error, f() has private access in A
4. Concepts: overloading
    - Part B, C: error, method f(int) is already defined