Inheritance

CSCI 2300

Class hierarchy

Organize classes into hierarchy, to avoid code duplication

Form of ‘generalization’

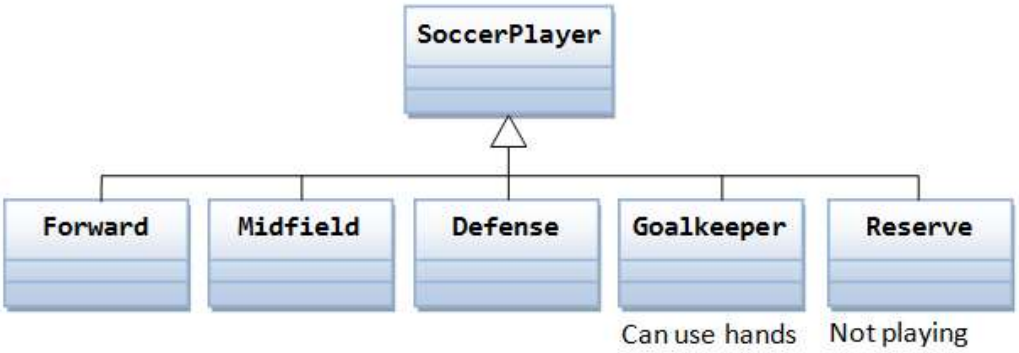
Put all common variables and methods into the parent class

Put specialized variables and methods into subclasses

Subclass inherits variables and methods of the parent class (and ‘grand-parent’ class)

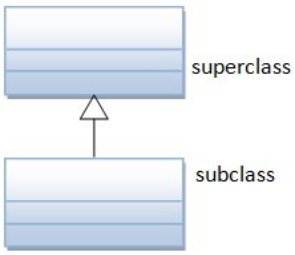
Subclass can override methods of the parent class – change the behavior

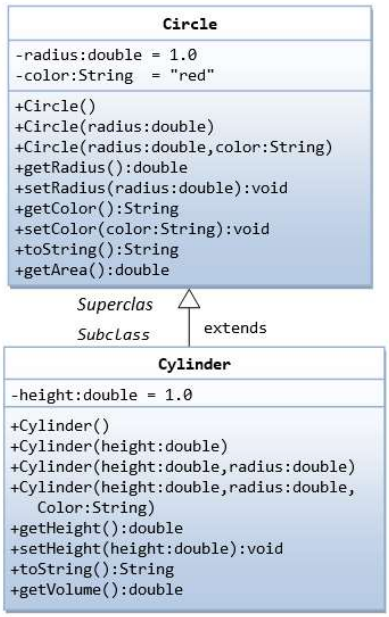
Class Hierarchy Example



Java Syntax and UML

```
public class GoalKeeper extends SoccerPlayer{ }
```





Example: Circle and Cylinder

Reusability principle of OOP

- Reusing Circle class

Cylinder inherits methods from the Circle class

Cylinder overrides methods of the Circle class

Cylinder adds cylinder specific variable and methods

Code example on the class site

Method overriding

@Override – annotation that asks compiler to check whether there is such a method in the superclass to be overridden

- Optional
- Nice to have
- Helps if you misspell the method name
- Has no effect on the execution of the program

Keywords ‘super’ and ‘this’

`this` – keyword that can be used inside a class to refer to the calling object

`super` – keyword that can be used inside a class to refer to the parent class

`super(args)` – calls the constructor of the parent class

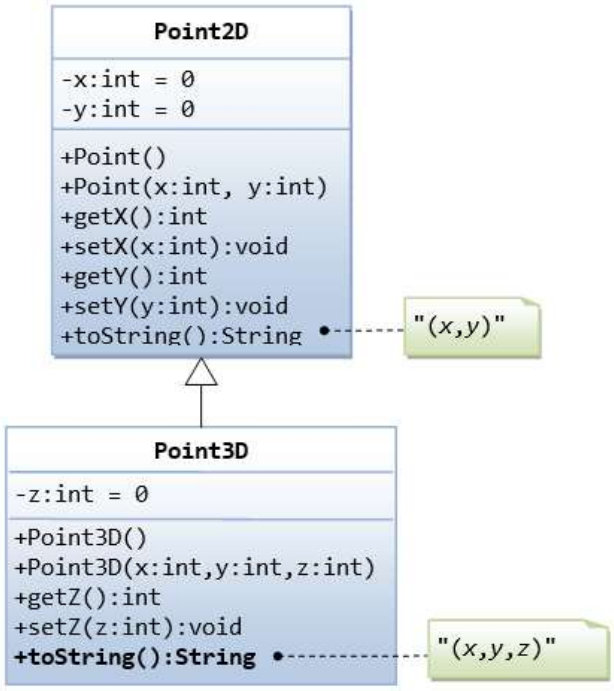
- If used in the constructor of a derived class, must be the first thing that happens

Default – no arguments constructor

If no constructor is defined, a default constructor is automatically generated

```
public ClassName(){
    super()
}
```

If parent class does not have a no-arguments constructor, you will get a compiler error



Example: Point2D and Point3D