AP Computer Science A Study Guide Unit 9

From Simple Studies: https://simplestudies.edublogs.org & @simplestudiesinc on Instagram

Inheritance

Creating Superclasses and Subclasses

- Class Hierarchy
    - Common attributes and behaviors of related classes into a single class called a superclass.
    - Classes extend a superclass
        - Known as subclasses
- Keyword Extends
    - Creating an inheritance relationship
- Class extends only one superclass.
- Multiple subclasses can extend a superclass.
- Subclass to superclass relationship
    - Forms a is-a relationship

Writing Constructors for Subclasses

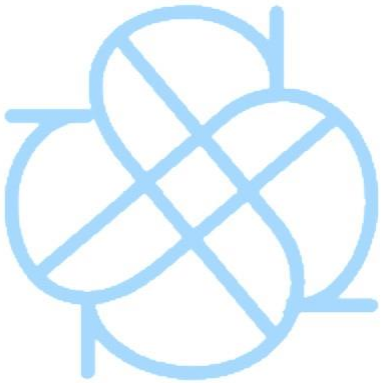
- Subclasses inherit private instance variables from the superclass.

- Constructors can’t be inherited.
- Instance variables are initialized from the parameters passed in the superclass from which we called the constructor.
- Superclass constructors continue until an Object constructor is called.
    - Doesn’t matter whether it’s called implicitly or explicitly.
- *Example (part 1)*

```
class Human
{
  private String name;

  public Human(String theName)
  {
    this.name = theName;
  }

  public String getName()
  {
    return name;
  }

  public boolean setName(String newName)
  {
    if (newName != null)
    {
      this.name = newName;
      return true;
```

- *Example (part 2)*

```
    }
    return false;
  }
```

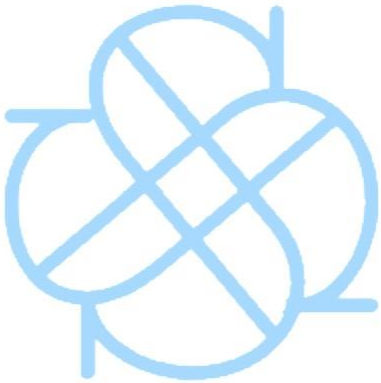


```
}

public class Employee extends Human
{

  private static int nextEmployeeId = 1;
  private int employeeId;
  public Employee(String theName)
  {
    super(theName);
    employeeId = nextEmployeeId;
    nextEmployeeId ++;
  }

  public int getEmployeeId()
  {
    return employeeId;
  }
  public static void main(String[] args)
  {
    Employee emp = new Employee("Ella");
    System.out.println(emp.getName());
    System.out.println(emp. getEmployeeId ());
  }
}
```

Overriding Methods

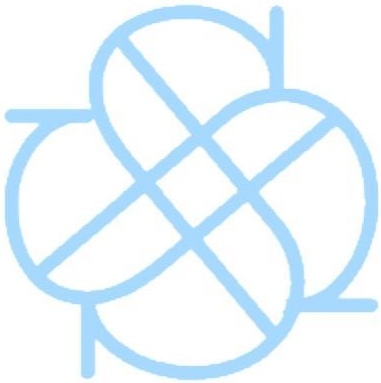
- Overriding methods
    - Methods in a subclass have the same method signature.
- Overloading methods
    - Multiple methods have the same name but different parameter types
    - Different order of the parameters

- OR the number of parameters are different



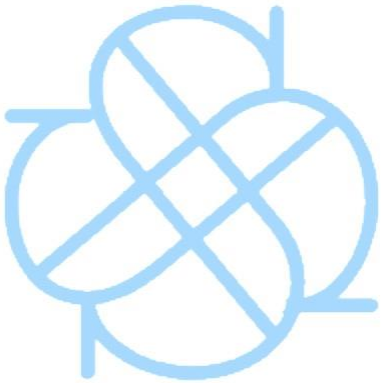
Super Keyword

- Two uses of the keyword super
  - `super();`
  - `super(arguments);`
  - `super.method();`
    - Calls the superclass method but not the constructors from the class.



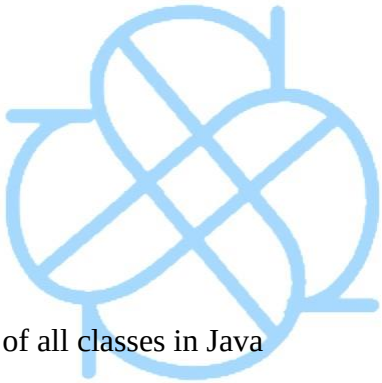
Creating References Using Inheritance Hierarchies

- Inheritance Hierarchy
    - Subclass inheriting from a superclass
    - Formed with an object
    - Objects at the top of the hierarchy



Polymorphism

- Compile Time
    - Methods in the declared type
    - Determines the accuracy of a non-static call
- Run Time
    - Methods in the object type
    - Implemented for a non-static call
    - Known as polymorphism



Object Superclass

- Object Class is superclass of all classes in Java
    - In the built-in java.lang package
- These are two Object class methods and constructors
    - String toString()
    - boolean equals(Object other)
- Subclasses of Object can override these methods with implementations that are specific to the class.