COP 3330: Object-Oriented Programming Summer 2011

In Class Practice #2

Instructor: Dr. Mark Llewellyn

markl@cs.ucf.edu

HEC 236, 407-823-2790

http://www.cs.ucf.edu/courses/cop3330/sum2011

Department of Electrical Engineering and Computer Science Computer Science Division University of Central Florida



In Class Practice #2

• Let's convert the UML class diagram shown below into an implemented Java class and use that class to illustrate the differences between class variables/methods and instance variables/methods.

Thing

<u>− a: int = 5</u>

- b: int

- + Thing()
- + Thing (int bValue)
- + getA (): int
- + setA (int aValue):void
- + getB (): int

Underlining a variable or a method in a UML diagram indicates that the variable or method is a class method.

This is also the standard format for specifying a default value for a variable in UML.



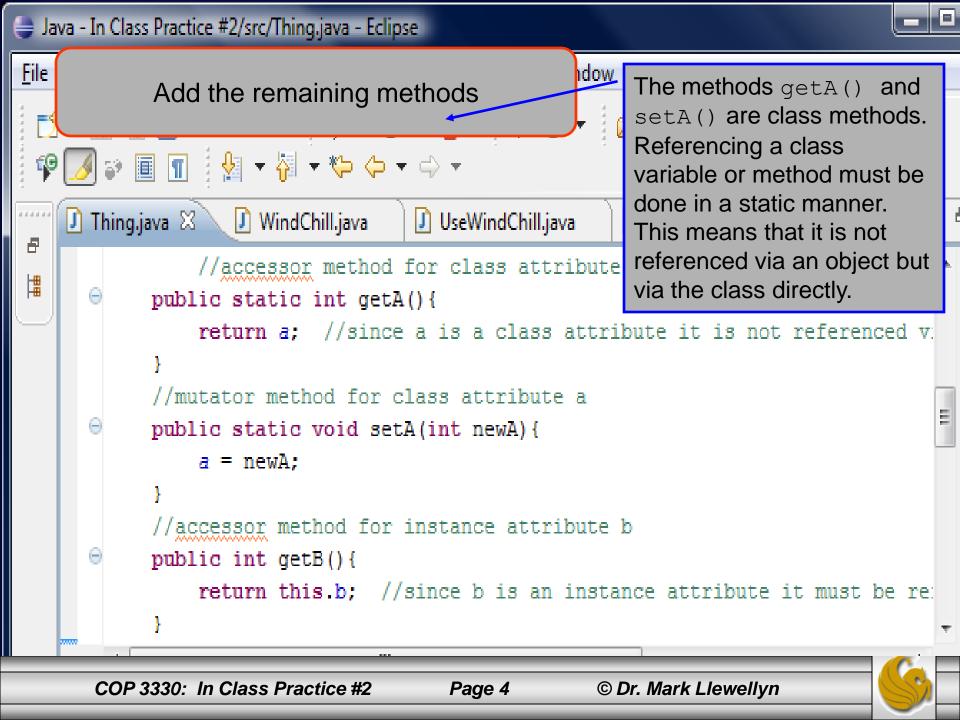
```
>>
21

■ Thing.java 

□ WindChill.java

                                                           Thing2.java
                                     UseWindChill.java
  ⊖ /* In Class Practice
                                   Create the class and add the class
     * Converting a UML d
                                     characteristics and constructors
     * Illustrating the d
     * variables and methods
     * MJL May 25, 2011
                                                  Static modifier indicates a class
     * /
                                                           variable.
    public class Thing
        private static int a = 5; //a is a class attribute
        private int b;
                                         //b is an instance attribute
         //no-arg default constructor method
                                                    Every object created using the
        public Thing() {
                                                   default constructor will have a b
             b = 1: \leftarrow
                                                            value of 1.
             //int-specific constructor method
  \Theta
        public Thing(int inB){
                                         Every object created using the int-specific
                                         constructor will have a b value equal to the
             this.b = inB; *
                                               value passes as a parameter.
   COP 3330: In Class Practice #2
                                    Page 3
```





eatIndexCalculator.

}//end class Thing

Construct the main method

```
//begin main method
public static void main(String[] args) {
   System.out.format("1 - The value of class attribute a is %d", Thing.a);
   System.out.format(" - Note that no objects have yet been created.\n");
   Thing object1 = new Thing(2); //create instance named object1
   System.out.format("2 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
   Thing object2 = new Thing(12); //create instance named object2
   System.out.format("4 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("5 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
   System.out.format("6 - The value of class attribute a is %d\n\n", Thing.a);
   Thing.setA(4); //change value of class attribute a
   System.out.format("7 - The value of class attribute a is %d\n", Thing.a);
   System.out.format("8 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("9 - Object 2 has values of: a = d \cdot b = d \cdot n, Thing.getA(), object2.getB());
   Thing object3 = new Thing(); //create default instance named object3
   System.out.format("10 - Object 1 has values of: a = dn b = dn, Thing.getA(), object1.getB());
   System.out.format("11 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
   System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
   System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
   Thing object4 = new Thing(); //create default instance named object3
   System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
   System.out.format("16 - Object 3 has values of: a = d \cdot b = d \cdot b. Thing.getA(), object3.getB());
   System.out.format("17 - Object 4 has values of: a = dnb = dn', Thing.getA(), object4.getB());
   System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
}//end main method
```



15 - Object 2 has values of: a = 4 and b = 12 16 - Object 3 has values of: a = 4 and b = 117 - Object 4 has values of: a = 4 and b = 1

18 - The value of class attribute a is 4

Execute the program

```
public static void main(String[] args) {
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created.\n");
       Thing object1 = new Thing(2); //create instance named object1
       System.out.format("2 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("3 - The value of class attribute
       Thing object2 = new Thing(12); //c
       System.out.format("4 - Object 1 ha Output Line 1:
                                                                                             tB());
       System.out.format("5 - Object 2 ha
                                                                                             tB());
       System.out.format("6 - The value o
                                        The variable a is a class variable. Any
       Thing.setA(4); //change value of c
       System.out.format("7 - The value o reference to it must be a static reference via
       System.out.format("8 - Object 1 ha the class and not via an instance of the class.
                                                                                             tB());
       System.out.format("9 - Object 2 ha
                                                                                              getB());
       Thing object3 = new Thing(); //create delault instance named objects
       System.out.format("10 - Object 1 has values of: a = dnb = dn', Thing.getA(), object1.getB());
       System.out.format("11 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = dnb = dn', Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

Why the output looks like it does. . .

```
public static void main(String[] args) {
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created.\n");
       Thing object1 = new Thing(2); //create instance named object1
       System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object2 = new Thing(12); //create instance named object2
       System.out.format("4 - Object 1 has values of: a = d and b = d". Thing.getA(), object1.getB());
       System.out.format("5 - Object
                                                                                        ct2.getB());
                                   Creating an instance of the class
       System.out.format("6 - The va
       Thing.setA(4); //change value
       System. out. format ("7 - The va This line calls the constructor method of the
       System.out.format("8 - Object
                                                                                        ct1.getB());
                                   Thing class to create an instance of the
       System.out.format("9 - Object
                                                                                        ject2.getB());
                                   class named object1. When object1 is
       Thing object3 = new Thing();
       System.out.format("10 - Object created it's b value is set to 2.
                                                                                        ect1.getB());
       System.out.format("11 - Objed
                                                                                        ect2.getB());
       System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("14 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args) {
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created.\n");
       Thing object1 = new Thing(2); //create instance named object1
       System.out.format("2 - Object 1 has values of: a = d = d = d, Thing.getA(), object1.getB());
       System.out.format("3 \rightarrow The value of class attribute a is d^n, Thing.a);
       Thing object2 = new Thing(12); //create instance named object2
       System.out.format("4 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("5 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("6 - The va
       Thing.setA(4); //change value Output Line #2
       System.out.format("7 - The va
       System.out.format("8 - Object
                                                                                              ct1.getB());
                                     This line has object1 invoke both the static
       System.out.format("9 - Object
                                                                                              ject2.getB());
                                     getA() and instance getB() methods to
       Thing object3 = new Thing();
       System.out.format("10 - Object
                                                                                              ect1.getB());
                                     return the current values of these two
       System.out.format("11 - Object
                                                                                              ect2.getB());
                                     characteristics. (a = 5 \text{ and } b = 2)
       System.out.format("12 - Object
                                                                                              ect3.getB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("14 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args) {
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created.\n");
       Thing object1 = new Thing(2); //create instance named object1
       System.out.format("2 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object2 = new Thing(12); //create instance named object2
       System.out.format("4 - bject 1 has values of: a = d = d = d, Thing.getA(), object1.getB());
       System.out.format("5 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("6 - The value of class attribute a is %d\n\n", Thing.a);
       Thing.setA(4); //change value of class attribute a
       System.out.format("7 - The valu
       System.out.format("8 - Object
                                                                                               1.getB());
                                       Output Line #3
       System.out.format("9 - Object 2
                                                                                               ct2.getB());
       Thing object3 = new Thing(); /
       System.out.format("10 - Object
                                                                                               t1.getB());
                                       Like line #1, this line simply prints the current
       System.out.format("11 - Object
                                                                                               t2.getB());
                                       value of the class variable a which is still 5.
       System.out.format("12 - Object
                                                                                               t3.getB());
       System.out.format("13 - The val
       Thing object4 = new Thing(); //
       System.out.format("14 - Object 1 has values of: a = dnb = dn', Thing.getA(), object1.getB());
       System.out.format("15 - Object 2 has values of: a = dnb = dn', Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = dnb = dn', Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args) {
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created.\n");
       Thing object1 = new Thing(2); //create instance named object1
       System.out.format("2 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object2 = new Thing(12); //create instance named object2
       System.out.format("4 \ Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("5 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("6 - The value of class attribute a is %d\n\n", Thing.a);
       Thing.setA(4); //change value of class attribute a
       System.out.format("7 - The va
       System.out.format("8 - Object
                                     Creating a second instance of the class
                                                                                              t1.getB());
       System.out.format("9 - Object
                                                                                              ect2.getB());
       Thing object3 = new Thing();
       System. out. format ("10 - Object This line creates another instance of the
                                                                                              ct1.getB());
       System.out.format("11 - Object class Thing. This instance is named
                                                                                              ct2.getB());
       System.out.format("12 - Object
                                                                                              ct3.getB());
                                      object2. When it is constructed, the b
       System.out.format("13 - The va
                                     value assigned to object2 is 12.
       Thing object4 = new Thing();
       System.out.format("14 - Object 1 mas values or: a = %q and b = %q\n", Ining.getA(), object1.getB());
       System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args) {
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created.\n");
       Thing object1 = new Thing(2); //create instance named object1
       System.out.format("2 - Object 1 has values of: a = d = d = d, Thing.getA(), object1.getB());
       System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object2 = new Thing(12); //create instance named object2
       System.out.format("4 - Object 1 has values of: a = d = d = d, Thing.getA(), object1.getB());
       System.out.format("5 \ Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("6 - The value of class attribute a is %d\n\n", Thing.a);
       Thing.setA(4); //change value of class attribute a
       System.out.format("7 - The value of class attribute a is %d\n", Thing.a);
       System.out.format("8 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("9 - Object
                                                                                               ct2.getB());
                                       Output Line #4
       Thing object3 = new Thing(); /
       System.out.format("10 - Object
                                                                                               t1.getB());
       System.out.format("11 - Object
                                                                                               t2.getB());
                                      This line has object1 invoke both the
       System.out.format("12 - Object
                                                                                               t3.getB());
                                       getA() and getB() methods to return the
       System.out.format("13 - The val
                                      current values of these two characteristics. (a
       Thing object4 = new Thing(); //
       System.out.format("14 - Object
                                                                                               t1.getB());
                                      = 5 and b = 2)
       System.out.format("15 - Object
                                                                                               t2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args) {
   System.out.format("1 - The value of class attribute a is %d", Thing.a);
   System.out.format(" - Note that no objects have yet been created.\n");
   Thing object1 = new Thing(2); //create instance named object1
   System.out.format("2 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
   Thing object2 = new Thing(12); //create instance named object2
   System.out.format("4 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("5_- Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
   System.out.format("6 - The value of class attribute a is %d\n\n", Thing.a);
   Thing.setA(4); //change value of class attribute a
   System.out.format("7 - The value of class attribute a is %d\n", Thing.a);
   System.out.format("8 - Object 1 has values
   System.out.format("9 - Object 2 ha Output Line #5
                                                                                               getB());
   Thing object3 = new Thing(); //cre
   System.out.format("10 - Object 1 h
                                                                                               retB());
   System.out.format("11 - Object 2 h This line has object2 invoke both the
                                                                                               retB());
   System.out.format("12 - Object 3 h
                                                                                               retB());
                                       getA() and getB() methods to return the
   System.out.format("13 - The value
                                       current values of these two characteristics. (a
   Thing object4 = new Thing(); //cre
                                      = 5 and b = 12)
   System.out.format("14 - Object 1 h
                                                                                               retB());
   System.out.format("15 - Object 2 has values or: a - sa and b - sa(h), ining.getA(), objectz.getB());
   System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
   System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
   System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
}//end main method
```

```
public static void main(String[] args) {
    System.out.format("1 - The value of class attribute a is %d", Thing.a);
    System.out.format(" - Note that no objects have yet been created.\n");
    Thing object1 = new Thing(2); //create instance named object1
    System.out.format("2 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
    System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
    Thing object2 = new Thing(12); //create instance named object2
    System.out.format("4 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
    System.out.format("5 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
    System.out.format("6_- The value of class attribute a is %d\n\n", Thing.a);
    Thing.setA(4); //change value of class attribute a
    System.out.format("7 - The value of class attribute a is %d\n", Thing.a);
    System.out.format("8 - Object 1 ha
                                                                                                tB());
    System.out.format("9 - Object 2 ha
                                                                                                getB());
                                       Output Line #6
    Thing object3 = new Thing(); //cre
    System.out.format("10 - Object 1 h
                                                                                                retB());
    System.out.format("11 - Object 2 h Like lines #1 and #3, this line simply prints
                                                                                                retB());
    System.out.format("12 - Object 3 h
                                                                                                retB());
                                       the current value of the class variable a
    System.out.format("13 - The value
    Thing object4 = new Thing(); //cre Which is still 5.
    System.out.format("14 - Object 1 h
                                                                                                retB());
    System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
    System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
    System.out.format("17 - Object 4 has values of: a = dnb = dn', Thing.getA(), object4.getB());
    System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
}//end main method
```

```
public static void main(String[] args) {
   System.out.format("1 - The value of class attribute a is %d", Thing.a);
   System.out.format(" - Note that no objects have yet been created.\n");
   Thing object1 = new Thing(2); //create instance named object1
   System.out.format("2 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
   Thing object2 = new Thing(12); //create instance named object2
   System.out.format("4 - Object 1 has values of: a = d = d = d, Thing.getA(), object1.getB());
   System.out.format("5 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
   System.out.format("6 - The value of class attribute a is %d\n\n", Thing.a);
   Thing.setA(4); //change value of class attribute a
   System.out.format("7 - The value of class attribute a is %d\n", Thing.a);
   System.out.format("9 - Object 2 has values of: a = dnb = dnn', Thing.getA(), object2.getB());
   Thing object3 = new Thing(); //crea
   System.out.format("10 - Object 1 ha
                                                                                          tB());
                                     Changing the value of the class variable
   System.out.format("11 - Object 2 ha
                                                                                          tB());
   System.out.format("12 - Object 3 ha
                                                                                          tB());
                                     This line changes the value of the class
   System.out.format("13 - The value o
   Thing object4 = new Thing(); //crea
                                     variable a, with a static invocation of the
   System.out.format("14 - Object 1 ha
                                                                                          tB());
                                     setA method, passing the value of 4 to the
   System.out.format("15 - Object 2 ha
                                                                                          tB());
                                     method. After executing this line, the value of
   System.out.format("16 - Object 3 ha
                                                                                         tB());
   System.out.format("17 - Object 4 ha
                                     a will be 4.
                                                                                          tB());
   System.out.format("18 - The value o
}//end main method
```

}//end main method



```
public static void main(String[] args) {
   System.out.format("1 - The value of class attribute a is %d", Thing.a);
   System.out.format(" - Note that no objects have yet been created.\n");
   Thing object1 = new Thing(2); //create instance named object1
   System.out.format("2 - Object 1 has values of: a = d = d = d, Thing.getA(), object1.getB());
   System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
   Thing object2 = new Thing(12); //create instance named object2
   System.out.format("4 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("5 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
   System.out.format("6 - The value of class attribute a is %d\n\n", Thing.a);
   Thing.setA(4); //change value of class attribute a
   System.out.format("7_- The value of class attribute a is %d\n", Thing.a);
   System.out.format("8 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("9 - Object 2 has values of: a = dnb = dnb, Thing.getA(), object2.getB());
   Thing object3 = new Thing(); / create default instance named object3
   System.out.format("10 - Object 1 ha
                                                                                                tB());
   System.out.format("11 - Object 2 ha
                                                                                                tB());
   System.out.format("12 - Object 3 ha Output Line #7
                                                                                                tB());
   System.out.format("13 - The value o
   Thing object4 = new Thing(); //crea
                                        Like lines #1, #3, and #6 this This line simply
   System.out.format("14 - Object 1 ha
                                                                                                tB());
                                       prints the current value of the class variable a
                                                                                               etB());
   System.out.format("15 - Object 2 ha
   System.out.format("16 - Object 3 ha
                                       which is now 4.
                                                                                                tB());
   System.out.format("17 - Object 4 ha
                                                                                                tB());
   System.out.format("18 - The value o
}//end main method
```

Why the output looks like it does. . .

```
public static void main(String[] args){
      System.out.format("1 - The value of cl
                                          Output Line #8
      System.out.format(" - Note that no obj
      Thing object1 = new Thing(2); //greate
      System.out.format("2 - Object 1/has va This line has object1 invoke both the
      System.out.format("3 - The value of cl
                                          getA() and getB() methods to return the
      Thing object2 = new Thing(12); //creat
                                         current values of these two characteristics. (a
      System.out.format("4 - Object 1 has va
      System.out.format("5 - Object 2 has va
                                         = 4 and b = 2)
      System.out.format("6 - The value of cl
      Thing.setA(4); //change value of class attribute a
      System.out.format("8 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
      System.out.format("9 - Object 2 has values of: a = %d and b = %d\n\n", Thing.getA(), object2.getB());
      Thing object3 = new Thing(); //create default instance named object3
      System.out.format("10 - Object 1 has values of: a = dnb = dn', Thing.getA(), object1.getB());
      System.out.format("11 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
      System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
      Thing object4 = new Thing(); //create default instance named object3
      System.out.format("14 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
      System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
      System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
      System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
      System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args){
       System.out.format("1 - The value of cl
       System.out.format(" - Note that no ob
                                              Output Line #9
       Thing object1 = new Thing(2); //create
       System.out.format("2 - Object 1 has va
       System.out.format("3 - The value of cl
                                              This line has object2 invoke both the
       Thing object2 = new Thing(12); //creat
                                              getA() and getB() methods to return the
       System.out.format("4 - Object 1 has va
                                              current values of these two characteristics. (a
       System.out.format("5 - Object 2 has va
       System.out.format("6 - The value of cl
                                              = 4 and b = 12)
       Thing.setA(4); //change value of class
       System.out.format("7 - The value of class accribate a is
       System.out.format("8 / Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("9' - Object 2 has values of: a = %d and b = %d\n\n", Thing.getA(), object2.getB());
       Thing object3 = new Thing(); //create default instance named object3
       System.out.format("10 - Object 1 has values of: a = dnb = dn', Thing.getA(), object1.getB());
       System.out.format("11 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("14 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args){
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created \n").
       Thing object1 = new Thing(2); //cye Creating a third instance of the class
       System.out.format("2 - Object 1 has
                                                                                                   B());
       System.out.format("3 - The value of
                                          This line creates another instance of the
       Thing object2 = new Thing(12); //cr
       System.out.format("4 - Object 1 has
                                           class Thing. This instance is named
                                                                                                   B());
       System.out.format("5 - Object 2 has
                                                                                                   B());
                                           object3. When it is constructed using the
       System.out.format("6 - The value of
       Thing. setA(4); //charge value of cl no-arg constructor, the b value assigned to
       System.out.format("7 - The value of
                                          object3 is 1.
       System.out.format("8 - Object 1 has
       System.out.format("9 - Object 2 has values of: a = dnb = dnh, Thing.getA(), object2.getB());
       Thing object3 = new Thing(); //create default instance named object3
       System.out.format("10 - Object 1 has values of: a = dnb = dn', Thing.getA(), object1.getB());
       System.out.format("11 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("14 - Object 1 has values of: a = d \cdot b = d \cdot b, Thing.getA(), object1.getB());
       System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args){
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created.\n");
       Thing object1 = new Thing(2); //create instance named object1
       System.out.format("2 - Object 1 has
       System.out.format("3 - The value of
                                          Output Line #10
       Thing object2 = new Thing(12); //cre
       System.out.format("4 - Object 1 has
                                                                                               3());
                                          This line has object1 invoke both the
       System.out.format("5 - Object 2 has
                                                                                               3());
       System.out.format("6 - The value of
                                          getA() and getB() methods to return the
       Thing.setA(4); //change value of cla
                                          current values of these two characteristics. (a
       System.out.format("7 - The value of
                                          = 4 and b = 2)
       System.out.format("8 - Object 1 has
                                                                                               3());
       System.out.format("9 - Object 2 has values or: a = a and b = a \ln n, Ining.getA(), object2.getB());
       Thing object3 = new Tring(); //create default instance named object3
       System.out.format("11 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("14 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args){
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no
       Thing object1 = new Thing(2); //cre Output Line #11
       System.out.format("2 - Object 1 Mas
                                                                                               B());
       System.out.format("3 - The value of
                                         This line has object2 invoke both the
       Thing object2 = new Thing(12); //cr
                                         getA() and getB() methods to return the
       System.out.format("4 - Object 1 has
                                                                                               B());
       System.out.format("5 - Object 2 has
                                         current values of these two characteristics. (a
                                                                                               B());
       System.out.format("6 - The falue of
                                         = 4 and b = 12)
       Thing.setA(4); //change varue of cl
       System.out.format("7 - The value of class attribute a is %d\n", Thing.a);
       System.out.format("8 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("9 - bject 2 has values of: a = %d and b = %d\n\n", Thing.getA(), object2.getB());
       Thing object3 = new Thing(); //create default instance named object3
       System.out.format("11 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("14 - Object 1 has values of: a = d \cdot b = d \cdot b, Thing.getA(), object1.getB());
       System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args){
      System.out.format("1 - The value of class attribute a is %d", Thing.a);
      System.out.format(" - Note that no
      Thing object1 = new Thing(2); //cx/e Output Line #12
      System.out.format("2 - Object 1 has
                                                                                         B());
      System.out.format("3 - The value of
                                      This line has object3 invoke both the
      Thing object2 = new Thing(12); //cr
                                      getA() and getB() methods to return the
      System.out.format("4 - Object 1 has
                                                                                         B());
      System.out.format("5 - Object 2 has
                                                                                         B());
                                      current values of these two characteristics. (a
      System.out.format("6 - The value of
                                      = 4 and b = 1)
      Thing.setA(4); //change value of cl
      System.out.format("7 - The value of class attribute a is %d\n", Thing.a);
      System.out.format("9 - Object 2 has values of: a = dnb = dnb, Thing.getA(), object2.getB());
      Thing object3 = new Thing(); //create default instance named object3
      System.out.format("10 / Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
      System.out.format("11 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
      System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
      Thing object4 = new Thing(); //create default instance named object3
      System.out.format("14 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
      System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
      System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
      System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
      System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args){
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created.\n");
       Thing object1 = new Thing(2); //cre
       System.out.format("2 - Object 1 has
                                                                                               B());
                                         Output Line #13
       System.out.format("3 - The value of
       Thing object2 = new Thing(12);
       System.out.format("4 - Object / has Like lines #1, #3 and #6, this line simply
                                                                                               B());
       System.out.format("5 - Object 2 has
                                                                                               B());
                                         prints the current value of the class variable a
       System.out.format("6 - The value of
                                         which is still 4.
       Thing.setA(4); //change value of cl
       System.out.format("7 - The value of
       System.out.format("8 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("9 - Object 2 has values of: a = %d and b = %d\n\n", Thing.getA(), object2.getB());
       Thing object3 = new Thing(); //create default instance named object3
       System.out.format("10 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("11 / Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("14 - Object 1 has values of: a = d \cdot b = d \cdot b, Thing.getA(), object1.getB());
       System.out.format("15 - Object 2 has values of: a = dnb = dn', Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

Execute the program





<terminated> Thing [Java Application] C:\Program Files\Java\jre6\bin\javaw.exe (May 31, 2011 12:17:45 PM)

- 1 The value of class attribute a is 5 Note that no objects have yet been created.
- 2 Object 1 has values of: a = 5 and b = 2
- 3 The value of class attribute a is 5
- 4 Object 1 has values of: a = 5 and b = 2
- 5 Object 2 has values of: a = 5 and b = 12
- 6 The value of class attribute a is 5
- 7 The value of class attribute a is 4
- 8 Object 1 has values of: a = 4 and b = 2
- 9 Object 2 has values of: a = 4 and b = 12
- 10 Object 1 has values of: a = 4 and b = 2
- 11 Object 2 has values of: a = 4 and b = 12
- 12 Object 3 has values of: a = 4 and b = 1
- 13 The value of class attribute a is 4
- 14 Object 1 has values of: a = 4 and b = 2
- 15 Object 2 has values of: a = 4 and b = 12
- 16 Object 3 has values of: a = 4 and b = 1
- 17 Object 4 has values of: a = 4 and b = 1
- 18 The value of class attribute a is 4

```
public static void main(String[] args){
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created \n").
       Thing object1 = new Thing(2); //cre
       System.out.format("2 - Object 1 has
                                        Creating a fourth instance of the class
                                                                                            B());
       System.out.format("3 - The value of
       Thing object2 = new Thing(12); //cr
                                        This line creates another instance of the
       System.out.format("4 - Object 1 has
                                                                                             B());
       System.out.format("5 - Object 2 has
                                        class Thing. This instance is named
                                                                                            B());
       System.out.format("6 - The value of
                                        object4. When it is constructed using the
       Thing.setA(4); //change value of cl
                                        no-arg constructor, the b value assigned to
       System.out.format("7 - The value of
                                        object4 is 1. Note that while object3 and
       System.out.format("8 - Object 1 has
                                                                                            B());
       System.out.format("9 / Object 2 has
                                                                                            retB());
                                        object 4 have the same values for their b
       Thing object3 = new Thing(); //crea
                                        attribute they are not the same object!
       System.out.format(/10 - Object 1 ha
                                                                                            tB());
       System.out.format ("11 - Object 2 ha
                                                                                            tB());
       System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args){
      System.out.format("1 - The value of class attribute a is %d", Thing.a);
      System.out.format(" - Note that no objects have yet been created.\n");
      Thing object1 = new Thing(2); //create instance named object1
      System.out.format("2 - Object 1 has
      System.out.format("3 - The value of
                                        Output Line #14
      Thing object2 = new Thing(12); //gre
      System.out.format("4 - Object 1 has
                                                                                           3());
                                        This line has object1 invoke both the
      System.out.format("5 - Object 2 has
                                                                                           3());
      System.out.format("6 - The value of
                                        getA() and getB() methods to return the
      Thing.setA(4); //change value of cla
                                        current values of these two characteristics. (a
      System.out.format("7 - The value of
                                        = 4 and b = 2)
      System.out.format("8 - Object 1 has
                                                                                           3());
      System.out.format("9 - Object 2 has values or: a = %q and b = %q\n\n", Ining.getA(), object2.getB());
      Thing object3 = new Thing(/; //create default instance named object3
      System.out.format("11 - bject 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
      System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
      Thing object4 = new Thing(); //create default instance named object3
      System.out.format("14 - Object 1 has values of: a = dn b = dn, Thing.getA(), object1.getB());
      System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
      System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
      System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
      System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

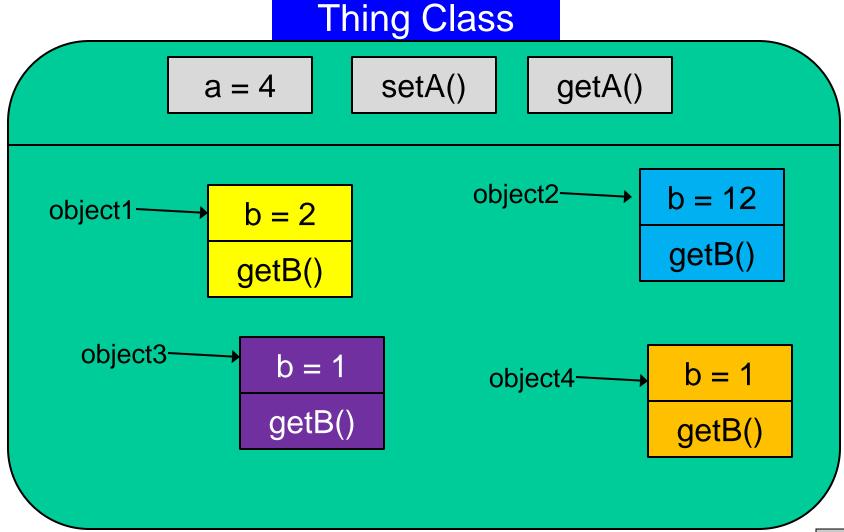
```
public static void main(String[] args){
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no
       Thing object1 = new Thing(2); //cme Output Line #15
       System.out.format("2 - Object 1 has
                                                                                                   B());
       System.out.format("3 - The value of
                                           This line has object2 invoke both the
       Thing object2 = new Thing(12);
                                           getA() and getB() methods to return the
       System.out.format("4 - Object 1
                                                                                                   B());
       System.out.format("5 - Object 2 has
                                           current values of these two characteristics. (a
                                                                                                   B());
       System.out.format("6 - The value of
                                           = 4 and b = 12)
       Thing.setA(4); //change value of cl
       System.out.format("7 - The value of class attribute a is %d\n", Thing.a);
       System.out.format("8 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("9 - Object 2 has values of: a = dnb = dnb, Thing.getA(), object2.getB());
       Thing object3 = new Thing(); //create default instance named object3
       System.out.format("10 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("11 - bject 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("14/- Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("15 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

```
public static void main(String[] args){
   System.out.format("1 - The value of class attribute a is %d", Thing.a);
   System.out.format(" - Note that no objects have yet been created.\n");
   Thing object1 = new Thing(2); //create instance named object1
   System.out.format("2 - Object 1 has values of: a = d = d = d, Thing.getA(), object1.getB());
   System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
   Thing object2 = new Thing(12); //create instance named object2
   System.out.format("4 - Object 1 has
                                                                                               B());
   System.out.format("5 - Object 2 h/s Output Line #16
                                                                                               B());
   System.out.format("6 - The value of
   Thing.setA(4); //change value of cl
                                       This line has object3 invoke both the
   System.out.format("7 - The value of
                                       getA() and getB() methods to return the
                                                                                               B());
   System.out.format("8 - Object 1 has
                                       current values of these two characteristics. (a
   System.out.format("9 - Object 2 has
                                                                                               retB());
   Thing object3 = new Thing(); //crea
                                       = 4 and b = 1)
   System.out.format("10 - Object 1 ha
                                                                                               tB());
   System.out.format("11 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
   System.out.format("12 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
   System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
   Thing object4 = new Thing(); //create default instance named object3
   System.out.format("14 / Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("15 - Object 2 has values of: a = dnb = dn', Thing.getA(), object2.getB());
   System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
   System.out.format("17 - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
   System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
}//end main method
```

```
public static void main(String[] args) {
   System.out.format("1 - The value of class attribute a is %d", Thing.a);
   System.out.format(" - Note that no objects have yet been created.\n");
   Thing object1 = new Thing(2); //create instance named object1
   System.out.format("2 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
   Thing object2 = new Thing(12); //create instance named object2
   System.out.format("4 - Object 1 has
                                                                                           B());
   System.out.format("5 - Object 2 h/s Output Line #17
                                                                                          B());
   System.out.format("6 - The value of
   Thing.setA(4); //change value of cl
                                     This line has object4 invoke both the
   System.out.format("7 - The value of
                                     getA() and getB() methods to return the
                                                                                          B());
   System.out.format("8 - Object 1 has
                                     current values of these two characteristics. (a
   System.out.format("9 - Object 2 has
                                                                                          retB());
   Thing object3 = new Thing(); //crea
                                     = 4 and b = 1)
   System.out.format("10 - Object 1 ha
                                                                                          tB());
   System.out.format("11 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
   System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
   Thing object4 = new Thing(); //create default instance named object3
   System.out.format("14 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
   System.out.format("15 / Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
   System.out.format("16/- Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
   System.out.format("17 - Object 4 has values of: a = dnb = dn', Thing.getA(), object4.getB());
   System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
}//end main method
```

```
public static void main(String[] args) {
       System.out.format("1 - The value of class attribute a is %d", Thing.a);
       System.out.format(" - Note that no objects have yet been created.\n");
       Thing object1 = new Thing(2); //create instance named object1
       System.out.format("2 - Object 1 has values of: a = d = d = d, Thing.getA(), object1.getB());
       System.out.format("3 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object2 = new Thing(12); //create instance named object2
       System.out.format("4 - Object 1 has values of: a = d = d = d, Thing.getA(), object1.getB());
       System.out.format("5 - Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("6 - The value p
       Thing.setA(4); //change value of o Output Line #18
       System.out.format("7 - The value o
       System.out.format("8 - Object 1
                                                                                                   tB());
       System. out. format ("9 - Object /2 ha Like lines #1, #3, #6, and #13, this line simply
                                                                                                    getB());
       Thing object3 = new Thing(); //cre
                                           prints the current value of the class variable a
       System.out.format("10 - Object 1 h
                                                                                                    retB());
                                           which is still 4.
       System.out.format("11 - Object 2 h
                                                                                                    retB());
       System.out.format("12 - Object 3 h
                                                                                                    retB());
       System.out.format("13 - The value of class attribute a is %d\n\n", Thing.a);
       Thing object4 = new Thing(); //create default instance named object3
       System.out.format("14 - Object 1 has values of: a = %d and b = %d\n", Thing.getA(), object1.getB());
       System.out.format("15 / Object 2 has values of: a = %d and b = %d\n", Thing.getA(), object2.getB());
       System.out.format("16 - Object 3 has values of: a = %d and b = %d\n", Thing.getA(), object3.getB());
       System.out.format("1) - Object 4 has values of: a = %d and b = %d\n", Thing.getA(), object4.getB());
       System.out.format("18 - The value of class attribute a is %d\n", Thing.a);
   }//end main method
}//end class Thing
```

What the objects look like at the end of exection





Execute the program

<terminated> Thing [Java Application] C:\Program Files\Java\jre6\bin\javaw.exe (May 31, 2011 12:17:45 PM)

1 - The value of class attribute a is 5 - Note that no objects have yet been created.

- 2 Object 1 has values of: a = 5 and b = 2
- 3 The value of class attribute a is 5
- 4 Object 1 has values of: a = 5 and b = 2
- 5 Object 2 has values of: a = 5 and b = 12
- 6 The value of class attribute a is 5
- 7 The value of class attribute a is 4
- 8 Object 1 has values of: a = 4 and b = 2
- 9 Object 2 has values of: a = 4 and b = 12
- 10 Object 1 has values of: a = 4 and b = 2
- 11 Object 2 has values of: a = 4 and b = 12
- 12 Object 3 has values of: a = 4 and b = 1
- 13 The value of class attribute a is 4
- 14 Object 1 has values of: a = 4 and b = 2
- 15 Object 2 has values of: a = 4 and b = 12
- 16 Object 3 has values of: a = 4 and b = 1
- 17 Object 4 has values of: a = 4 and b = 1
- 18 The value of class attribute a is 4