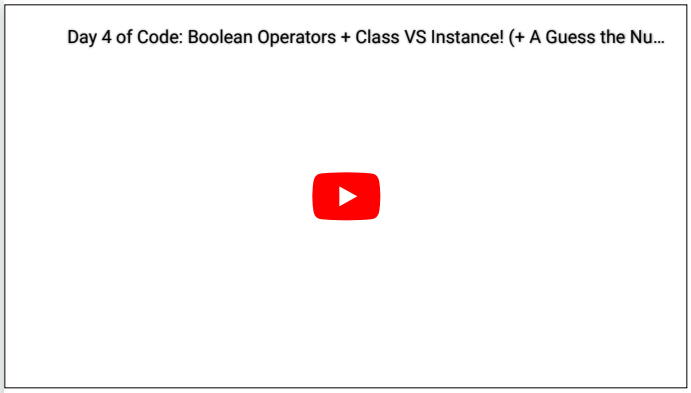
Day 4: Class vs. Instance



Terms you'll find helpful in completing today's challenge are outlined below, along with sample Java code (where appropriate).

Class

A blueprint defining the charactaristics and behaviors of an object of that class type. Class names should be written in CamelCase, starting with a capital letter.

```
class MyClass{
    ...
}
```

Each class has two types of variables: class variables and instance variables; class variables point to the same (static) variable across all instances of a class, and instance variables have distinct values that vary from instance to instance.

Class Constructor

Creates an instance of a class (i.e.: calling the Dog constructor creates an instance of Dog). A class can have one or more constructors that build different versions of the same type of object. A constructor with no parameters is called a default constructor; it creates an object with default initial values specified by the programmer. A constructor that takes one or more parameters (i.e.: values in parentheses) is called a parameterized constructor. Many languages allow you to have multiple constructors, provided that each constructor takes different types of parameters; these are called overloaded constructors.

```
class Dog{ // class name
    static String unnamed = "I need a name!"; // class variable
    int weight; // instance variable
    String name; // instance variable
    String coatColor; // instance variable

    Dog(){ // default constructor
        this.weight = 0;
        this.name = unnamed;
        this.coatColor = "none";
    }
    Dog(int weight, String color){ // parameterized constructor
        // initialize instance variables
        this.weight = weight; // assign parameter's value to instance variable
        this.name = unnamed;
        this.coatColor = color;
    }
    Dog(String dogName, String color){ // overloaded parameterized constructor
        // initialize instance variables
        this.weight = 0;
        this.name = dogName;
        this.coatColor = color;
    }
}
```

Method

A sort of named procedure associated with a class that performs a predefined action. In the sample code below, returnType will either

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be a data type or ***void*** if no value need be returned. Like a constructor, a method can have **0** or more parameters.

```
returnType methodName(parameterOne, ..., parameterN){
    ...
    return variableOfReturnType; // no return statement if void
}
```

Most classes will have methods called getters and setters that get (return) or set the values of its instance variables. Standard getter/setter syntax:

```
class MyClass{
    dataType instanceVariable;
    ...
    void setInstanceVariable(int value){
        this.instanceVariable = value;
    }
    dataType getInstanceVariable(){
        return instanceVariable;
    }
}
```

Structuring code this way is a means of managing how the instance variable is accessed and/or modified.

Parameter

A parenthetical variable in a function or constructor declaration (e.g.: in `int methodOne(int x)`, the parameter is `int x`).

Argument

The actual value of a parameter (e.g.: in `methodOne(5)`, the argument passed as variable `x` is `5`).

Additional Language Resources

Python Class and Instance Variables

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