Exercise 4 – Objects

Objective

The objective of this exercise is to understand how to create and use objects in Java

Overview

This exercise is in two parts. First we're going to create some objects based around a scenario and then you're going to model something of your own.

With all these exercises it is best to test each step as you write. To do this with objects create a class with a main method in it, then create the objects in this method and print out the various fields and output from methods as you write it. For example, after writing a setName method, a good test is to create an object of that type, call setName, then call getName, printing out the results.

Step 1 - Books

1. Create a class that describes a book. It should have a name, author and price
2. Write a constructor that sets all the fields in the class
3. Create getter and setter methods for each of the fields in the class. Make sure that you set your fields to private - this is both good practice and good for security!
4. Create toString method by selecting all fields
5. In your test class create a number of books and print out the contents of them
6. Declare an array variable to store up to three Book objects
7. Add the books(Book objects) to the array created in previous step and loop through the array printing out the contents of each object

Step 2 - Creating your own objects

Think of a real world object and model it in Java form. Think about the fields you will need to describe the object and any methods that will act on it. Then write the code for your object including a constructor, accessor and mutator methods, and a toString method.

See if you can think of a situation where a private method may be useful for your object. Have a play around with scope and the differences between public, private and protected.

Glossary of key terms

Object

An object is the combination of state and behaviour

Programming object

An instance of a class

Class

It is a specification of a real world object, acts as a placeholder for variables and methods.

Constructor method

It is a special member method which is called when the Java class is instantiated

Method

It is a block of code which can be declared once and called many times

Instantiation

The process of creating objects from the class

Encapsulation

The process of combining the variables and methods into a separate logical unit

Static members

These members (variables and methods) are able to be called without an instance of the object being created

Boilerplate code

It refers to simple methods classes and annotation that you will end up writing over and over again